EXPANDING THE UNIT OF ANALYSIS AND INTERVENTION FOR CHILDREN
WITH DEVELOPMENTAL DISABILITIES AND FOOD REFUSAL BEHAVIOUR

by

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ABSTRACT

The purpose of this study was to empirically investigate an approach to behavioural feeding intervention that integrates child eating behaviour, parent-child interaction, and the activity setting of meal routines into an ecological unit of analysis. The aim of this unit of analysis is to generate necessary and sufficient knowledge for the design of effective and acceptable feeding interventions that parents can sustain across a variety of natural family meal routines in the home for a long period of time. Specifically, the present study examined the efficacy of an ecological behavioural feeding approach for: (a) improving child eating behaviour; (b) empowering parents to build a valued and successful mealtime routine; and (c) transforming coercive parent-child interactions into constructive interactions in meal routines. Three families of children with developmental disabilities and severe food refusal behaviour participated. One home-based meal routine for each family was selected for assessment and intervention. A single subject, nonconcurrent, multiple baseline design across families was employed. Direct observation data were gathered across baseline, intervention, and follow up phases. Following implementation of the ecological behavioural feeding approach, single subject research results showed improvements in child problem behaviour, consumption of new foods, and participation in valued meal routines. These improvements maintained three months post-intervention. Sequential analysis results across the three families showed improvements in parent-child interaction during meal routines. Statistically significant, four-step coercive processes were evidenced during baseline but not during intervention. The onset of intervention evidenced the emergence of statistically significant, four-step constructive processes. Social validity data indicated that the families viewed the approach as acceptable. Positive outcomes, however, were moderated by little to no improvement in overall family functioning. Results are discussed in terms of contributions to
the literature, limitations and cautions, and implications for practitioners and researchers who are involved in behavioral feeding interventions.
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CHAPTER 1

FOOD REFUSAL BEHAVIOUR

Feeding problems are reported to occur frequently in young children with developmental disabilities. Studies have reported prevalence figures ranging from 33% (Babbit et al., 1994) to as high as 90% (Swartz, 2003). A classic review by Bentovim (1970), also reported that an estimated 30% to 45% of typically developing children experience a variety of mealtime problem behaviours during early childhood; however, these feeding problems are often intermittent and transitory, and thus do not require extensive professional support (O’Brien et al., 1991).

Extreme food selectivity is an enduring problem (i.e., over several months or years) in which a child voluntarily limits intake to a highly restricted range of foods based on type (e.g., starches and fruit), texture (e.g., pureed, crunchy), taste (e.g., sweet foods) or other sensory dimensions (e.g., shape of food, temperature, foods mixed together) (Kedesdy & Budd, 1998; Luiselli, 2006). Children with extreme food selectivity also are likely to exhibit socially stigmatizing mealtime problem behaviours such as spitting, gagging, vomiting, crying, aggression, and self-injury (Babbit et al., 1994).

Research suggests that physiological or behavioural factors or some combination of these factors contribute to the development and maintenance of severe feeding problems (Ahearn, 2001; Budd, 1998; Kerwin, 2003; Manno, Fox, Eicher, & Kerwin, 2005). Within a physiological framework, successful eating requires intact anatomical structures and neurological functioning. Any impairment of the anatomy or neurology of the child can contribute to the development of a feeding disorder (Budd, 1998). For example, dysphagia, a physiological swallowing dysfunction, might make eating and drinking painful or unpleasant for the child. A number of neurological
conditions both obvious (e.g., a child with cerebral palsy) and subtle (e.g., a slight asymmetrical motor pattern) can complicate a child’s ability to eat by affecting oral motor skills, gross motor movements, and experience with the use of oral motor reflexes (Kerwin, 2003). Other common physiological factors that impact a child’s success with feeding include respiratory and gastrointestinal functioning (Budd, 1998; Manno et al., 2005).

Although, physiological problems can directly cause a feeding problem, it is not common for severe feeding problems to develop without the significant contribution of environmental variables (Ahearn, 2001). A feeding problem may begin because of a physical or anatomical problem; however, behavioural factors are likely to play a role in the exacerbation and maintenance of the feeding problem (Kerwin, 2003; Manno, et al., 2005; Riordan, Iwata, Finney, Wohl, & Stanley, 1984). A defining feature of food selectivity is that even though physiological factors (e.g., physical abnormalities, gastrointestinal disease) may have contributed to the development of the feeding problem, these factors have been ruled out as insufficient to explain the protracted nature of the problem (Werle, Murphy, & Budd, 1998). Importantly, Babbit and colleagues (1994) report that approximately 20% of feeding problems are the result of only environmental factors.

Within a behavioural framework, a variety of problematic caregiver feeding practices can cause, strengthen, and maintain a child’s inappropriate feeding patterns (Babbit et al., 1994). Examples of problematic feeding practices include allowing a child unlimited access to food between meals; failing to provide structured predictable meals; too few verbal or physical prompts; providing social attention in response to food refusal; permitting the child to leave the table contingent on problematic feeding behaviour; pleading and bargaining with the child; and
failing to attend positively to appropriate feeding behaviour (Budd & Chugh, 1998; Sanders, Patel, LeGrice, & Shepherd, 1993).

Food refusal has received much attention in the literature due to the negative consequences it has on the child and family (Kedesdy & Budd, 1998). Over time, if left untreated, children with extreme food selectivity are at risk for malnutrition, delayed growth, dehydration, and weight loss (Secretz-Mertz, Brotherson, Oakland, & Litchfield, 1997). In addition, the presence of co-occurring problem behaviours, food refusal can lead to difficult and prolonged feeding times that often result in the child being fed outside the natural family meal routine. If problematic mealtime behaviours are not resolved, the child is likely to miss out on critical social and learning opportunities available during mealtimes (Luiselli, 2006; Swartz, 2003). For a parent, the struggle to cope with a child’s atypical eating patterns can lead to increased parental stress, feelings of inadequacy in their parenting skills, and negative parent-child relationships (Franklin & Rodger, 2003; McCartney, Anderson, & English, 2005; Werle et al., 1998).

**Review of the Literature**

The vast majority of research on the treatment of food refusal has consisted of single-subject research studies and clinical case studies that utilize behavioural strategies (Kerwin, 1999; Werle, Murphy, & Budd, 1993). Many studies offer empirical evidence of the effectiveness of behavioural interventions in the amelioration of food refusal in children with developmental disabilities. Behavioural interventions have included consequence-based strategies such as positive reinforcement (e.g., Bernal, 1972), negative reinforcement (e.g., Palmer, Thompson, & Linscheid, 1975; Kelley, Piazza, Fisher, & Oberdorff, 2003), and escape extinction (e.g., non-removal of the spoon and physical guidance; Ahearn, Kerwin, Eicher, &
Taylor-Lukens, 2001), as well as antecedent-based strategies such as stimulus fading techniques for texture or amount of food (e.g., Luiselli, 2000; Mueller, Piazza, Patel, Kelley, & Pruett, 2004; Munk & Repp, 1994; Shore, Babbit, Williams, Coe, & Snyder, 1998), non-contingent reinforcement (Reed et al., 2004), simultaneous food presentation (Kern & Marder, 1996), and manipulation of contextual variables (e.g., withholding of food 3 hours prior to intervention; Levin & Carr, 2001; Werle et al., 1998).

Recognizing the adverse effects that persistent feeding problems have on the lives of children and their families, researchers and practitioners in the field of applied behaviour analysis have defined several features of an effective approach to behavioural assessment and intervention. First, studies focused on ameliorating feeding problems have increasingly demonstrated that parents have the capacity to become skilled in the use of specific behavioural support strategies (Anderson & MacMillan, 2001; Didden, Seys, & Schouwink, 1999; McCartney et al., 2005; Mueller et al., 2003; Werle et al., 1993, 1998). With parents as treatment agents, generalization of feeding behaviours and maintenance of outcomes is more likely to occur (Freeman & Piazza, 1998; Shore et al., 1998). Second, there is an increasing emphasis on the use of functional analysis procedures to address feeding problems (Levin & Carr, 2001; Galensky, Miltenberger, Stricker, & Garlinghouse, 2001; Girolami & Scotti, 2001; Piazza et al., 2003; Werle et al., 1993, 1998). Understanding the environmental variables that set up, trigger, and maintain food refusal behaviour can be helpful in developing more effective and efficient interventions. Finally, the development of antecedent strategies (e.g., stimulus fading) has led to an increase in the design and implementation of multicomponent intervention plans (Kern & Marder, 1996; Luiselli, 2006; Shore et al., 1998). Given that there are typically several features to a feeding problem (e.g., antecedent events that trigger behaviour, consequences that reinforce
behaviour), multicomponent plans that address all of these features are likely to be more effective and efficient at decreasing food refusal and increasing food acceptance than plans that address only one component of the problem (e.g., the use of consequence strategies).

Despite these advancements, families continue to have difficulty obtaining effective behaviour support in family mealtime settings. Families report the need for: (a) assessment that helps parents understand their child’s problematic feeding behaviour (Franklin & Rodger, 2003); (b) interventions that promote meaningful change in their child’s eating behaviour across all mealtime routines in the home and community; (c) interventions that are positive and practical (Linscheid, 2006); and (d) outcomes that endure for many years (McCartney et al., 2005).

Gaps in the Empirical Foundation for Behavioural Feeding Intervention

Behavioural researchers and practitioners speak directly to these needs when they argue that the ultimate criterion for success of a behavioural feeding intervention is its survivability in natural settings (Linscheid, 2006). For families of children with developmental disabilities and extreme food selectivity, survivable interventions are those that parents experience as acceptable, positive, practical, and effective and that promote improvements in child eating behaviour that are meaningful and durable over an extended period of times (i.e., years). Although there has been much progress in our empirical knowledge about the design of effective behavioural interventions, there remain several gaps in the literature that may affect the survivability of behavioural feeding interventions in natural mealtime contexts. First, our understanding of the etiology of extreme food selectivity during family mealtime routines is not well developed (Piazza et al., 2003; Sanders et al., 1993;). Very few studies have examined, for example, the bidirectional effects of parent-child interaction on the development and maintenance of feeding problems. Second, although behavioural interventions have been shown to be effective in
improving child feeding behaviour in clinical settings, very few studies have examined the efficacy and practicality of such interventions used by parents in natural home settings (Ledford & Gast, 2006; Linscheid, 2006). As a result, there is little understanding about the way in which family contexts may influence problematic feeding behaviour and the ability of parents to use evidence-based interventions in the natural milieu of family mealtimes. Third, although the use of functional assessment procedures have begun to emerge in the food refusal literature to identify the functions of food refusal behaviour, very few studies have documented the use of these procedures to assess the structural variables (i.e., setting events and antecedent stimuli) that influence food refusal behaviour (Girolami & Scotti, 2001).

Recognizing these gaps in our empirical base for children with persistent feeding difficulties, I believe that the criterion of survivability for families in natural mealtime contexts requires an in-depth understanding of the etiology of problem behaviour in mealtimes and of the ecology surrounding mealtimes and family life. I propose that direction can be found in three areas of research in the fields of applied behaviour analysis and clinical and community psychology: (a) research on the functions of problematic feeding behaviour; (b) research on coercive processes of parent-child interaction; and (c) research on the activity setting as a unit of analysis.

**Functions of Problematic Feeding Behaviour**

A large body of empirical evidence demonstrates that problem behaviour such as self-injury, destructive behaviour, aggression, and tantrums are learned behaviour maintained through interactions with the social and physical environment (Cooper, Heron, & Heward, 2007). That is, children with developmental disabilities engage in problem behaviour for specific functions or purposes (Carr & Durand, 1985; Iwata, Dorsey, Slifer, Bauman, & Richman 1982). These
functions fall largely into three broad categories: (a) obtaining social attention; (b) avoiding or escaping non-preferred or aversive demands, tasks, or people; and (c) gaining access to a preferred item, activity, or situation (Derby et al., 1997; O’Neill et al., 1997). Functional behaviour assessment is a process that involves gathering information to understand the specific function(s) a behaviour serves for a person. Assessment procedures (e.g., interviews, direction observations, experimental manipulations) are used to identify the environmental variables that set up, trigger, and maintain problem behaviour (Cooper et al., 2007). The ultimate purpose of a functional behaviour assessment is to gather information necessary to design an effective and efficient behaviour support plan. A recent meta-analysis of 109 behaviour intervention studies by Carr et al. (1999) showed that behaviour interventions that were based on a functional assessment were more likely to be effective compared to behaviour interventions that were selected with no regard to the function of behaviour.

Based on the success of behavioural interventions such as escape extinction and differential reinforcement, it has been hypothesized that a feeding problem is strengthened and maintained through the child’s interaction with his/her environment (Piazza et al., 2003). A child may engage in food refusal and related mealtime problem behaviours to avoid or escape non-preferred foods and/or the meal context, obtain social attention, or gain access to preferred foods or activity. Despite the applied behaviour analytic framework of most food refusal studies, only recently have behaviour analysts begun to use functional behaviour assessment procedures to guide intervention planning.

Piazza and colleagues (2003) compared the effectiveness of using naturalistic observation and experimental functional analysis to assess problematic feeding behaviour for six children with developmental disabilities and food refusal behaviour. First, the authors conducted
naturalistic observations of parents feeding their child in a room in the clinic. Parents were asked to respond to their child’s behaviour as they would do at home. Results from these observations showed that parents used a variety of consequences during meals. Next, an experimental functional analysis was conducted to evaluate the individual effects of each parental consequence. Using experimental conditions similar to those describe by Iwata et al. (1982), the authors tested three types of consequences: (a) negative reinforcement in the form of escape from the demand to eat the food; (b) positive reinforcement in the form of attention; and (c) positive reinforcement in the form of tangible items. Each condition was tested in a clinic setting with a therapist feeding the child. Results from both the naturalistic observation and functional analysis indicated that environmental variables played a role in the occurrence of problematic feeding behaviour. However, during naturalistic observations, given the variety of consequences parents were observed using, the authors reported difficulty in determining which consequences affected behaviour. Results from the functional analysis provided a clearer, more accurate understanding of the specific consequences maintaining food refusal behaviour.

Similarly, Girolami and Scotti (2001) demonstrated the utility and feasibility of conducting an experimental functional analysis of food refusal and related mealtime problem behaviour. However, in contrast to Piazza and colleagues (2003), functional analysis procedures were situated in the home environment where meals typically occur. The authors also demonstrated a high level of concurrent validity between analog conditions and other functional assessment methods (parent interview, parent questionnaires, descriptive observations). First, parental interviews and questionnaires were conducted to identify targeted problematic mealtime behaviours and alternative behaviours. Observations of three separate mealtimes provided the authors with information regarding special circumstances that occurred during mealtimes (e.g.,
seating arrangement, mealtime schedule, portion size). The authors then set up conditions similar to the natural mealtime routine to systematically examine the variables maintaining disruptive behaviour for three young children. Results indicated that the experimental analysis in the home setting was effective in determining the function of food refusal behaviour. In addition, there was a high level of agreement between the various methods of assessing the function of food refusal. For two children, escape from food presentation and other mealtime demands was the primary function. In contrast, the function of the third child’s problematic feeding behaviour was less distinguishable; the authors suggested several functions, including seeking attention and seeking tangible items (i.e., preferred food or toys).

Najdowski, Wallace, Doney, and Ghezzi (2003) extended the results of Piazza et al. (2003) and Girolami and Scotti (2001), by evaluating the effects of a parent-conducted experimental functional analysis and treatment in the home and in a restaurant. During each condition of the functional analysis, the mother was instructed by the primary investigator to deliver certain antecedents and consequences to her 5-year old child with autism and food refusal behaviour. Results from the functional analysis showed that the primary function of food refusal behaviour was escape. These results guided the development of a multicomponent treatment plan that included a demand fading procedure, differential reinforcement of alternative behaviours, and an escape-extinction procedure. Training sessions took place in the home and restaurant with the mother as the interventionist. Results showed that a functional analysis was helpful in designing an effective treatment for food refusal. Food acceptance increased in both settings and maintained three months later.

Additional empirical evidence for the efficacy of a functional approach to persistent feeding problems has been demonstrated using descriptive functional behaviour assessment
procedures (i.e., naturalistic observations) and indirect functional assessment methods (e.g., interviews, questionnaires, checklists). Luiselli (2000) investigated the effects of a parent implemented functional assessment-based behaviour treatment package for a young child with a congenital disorder and chronic food refusal. Descriptive (i.e., observations) and indirect (i.e., parent interview) functional assessment procedures conducted during a home-based mealtime routine identified the environmental antecedents and consequences that controlled problematic feeding behaviour. The author suggested that the child engaged in food refusal behaviour to avoid the demand to self-feed and to gain social attention from his parents. This information guided the development of a multicomponent treatment plan that included visual cuing, demand fading, and positive reinforcement. All treatment sessions took place in the home setting with both parents present. Periodically, the child’s siblings also were present for meals. A changing criterion design clearly documented a functional relationship between parent implementation of the intervention package and a step-wise increase in self-feeding. Follow-up data evidenced maintenance and continued improvement at one year post-intervention. The child was reported to have gained 5.5 pounds and to be consuming a wider variety of food textures.

Galensky, Miltenberger, Stricker, and Garlinghouse (2001) investigated whether direct functional assessment methods were more effective than indirect functional assessment methods in determining the function of food refusal behaviour for three young typically developing children. Direct functional assessment methods involved direct observations of the antecedents and consequences that controlled problematic mealtime behaviour. Indirect functional assessment procedures included a functional assessment questionnaire specifically related to mealtime problem behaviour, and a functional assessment interview. Following the completion of each assessment method, the first author determined the function of food refusal and then
rated her confidence in the hypothesis on a 7-point scale. Additionally, interobserver agreement on the function of food refusal was gathered by having two experimenters independently review the questionnaire, an audiotape of the interview, a videotape of the meals, and record their hypotheses. Hypotheses developed from direct observations yielded the highest confidence ratings and the highest interobserver agreement. As a result, these hypotheses were used to develop for each child a functional treatment package composed of stimulus fading, reinforcement and extinction procedures. Caregivers were then trained to implement the interventions in the natural mealtime setting, with the entire family present. A multiple baseline across families documented the intervention’s effectiveness in improving food acceptance for two of the three children. In addition, food expulsions decreased significantly for one child. Given this research, we believe that understanding the functions of problem feeding behaviour and designing interventions linked to these functions is the first necessary condition for the development of survivable feeding interventions.

_Coercive Patterns of Parent-child Interaction_

Clinical psychology research with young children without developmental disabilities strongly suggests that expanding behavioural assessment beyond parent or child behaviour to a focus on parent-child interaction and the bi-directional effects between the parent and child is essential to the development of effective and durable interventions in family contexts (Patterson, 1982; Snyder & Stoolmiller, 2002). Behavioural family intervention research with aggressive boys (Reid, Patterson, & Snyder, 2002) offers longitudinal evidence for a theory of coercion in which problem behaviours in young children have their etiology in the cumulative moment-by-moment (micro) actions and reactions that occur between parents and children. The core of coercion theory involves an aversive, escape conditioning sequence of interaction comprised of
four steps: (a) parent makes a demand; (b) child engages in problem behaviour; (c) parent withdraws the demand; and (d) child terminates problem behaviour. The parent’s effect on the child occurs when she or he withdraws the demand, thus negatively reinforcing child problem behaviour. The child’s effect on the parent occurs when he or she terminates problem behaviour, thus negatively reinforcing the parent for submission. Over time, this well-rehearsed sequence of exchanges becomes automatic or reflexive. Both the parent and child are unaware of the consequences of their own behaviour and thus become trapped in a relationship that reciprocally maintains child problem behaviour and ineffective parenting practices (Patterson, Reid, & Dishion, 1992). Observational studies also revealed that both the parent and child may alternately assume the role of victim and aggressor. Although children are more likely to use coercive tactics to achieve their wants or needs, Patterson observed that some parents escalated into intense aversive behaviour in response to their child’s persistent defiant behaviour and after doing so, the child sometimes complied (Patterson, 1976). In addition, families with more established coercive patterns are more likely to respond with an aversive counterattack and continue to act in an aversive manner regardless of the other person’s reaction. Longitudinal research (Patterson, Forgatch, Yoerger, & Stoolmiller, 1998) has shown that without early and intensive intervention, coercive parent-child interactions set children on a trajectory towards anti-social behaviour, academic failure, affiliation with deviant peer groups, and juvenile delinquency.

Although many feeding studies report the negative impact food refusal has on the quality of parent-child interactions (Franklin & Rodger, 2003; Secritz et al, 1997), very few studies to date have systematically examined the bi-directional role of coercive parent-child interaction in the development and maintenance of feeding disorders. Davies and colleagues (2006) suggested
that diagnostic approaches must expand beyond examining the characteristics of the individual child to also recognize the, “systemic and multidetermined nature of the feeding relationship” (p. 412). Adoption of the term “feeding” rather than “eating” disorder suggests that difficulties with ingestion of food in early childhood stem from the parent-child relationship and not from the individual child (Kerwin, 2003). Feeding times represent a complex set of reciprocal interactions, including accurate interpretation of cues related to satiety and hunger, pacing of feeding, and adaptation of a parent’s behaviour in response to a child’s temperament (e.g., fussiness) (Budd, Chugh, & Berry, 1998). Therefore, in addition to conducting a functional behaviour assessment to assess the effects of parenting behaviour on child food refusal, it is important to assess the effects of the child’s food refusal on parent behaviour. For a parent, terminating the meal in response to a child’s tantrum may produce the effect of the child terminating or reducing problem behaviour. If this occurs often enough, parent submission will be strengthened and maintained by negative reinforcement (Piazza et al., 2003). Failure to assess and intervene on aversive microsocial interactions that reciprocally maintain child food refusal and ineffective parenting practices may put the child at increased risk of more severe problems in later childhood and adolescence (Kedesdy & Budd, 1998). As noted by Swartz (2003), “malnutrition arises insidiously and progresses over time” (p. 320).

Sanders, Patel, Le Grice and Shepherd (1993) examined the social interactional processes surrounding eating within families of children with persistent feeding difficulties. The authors compared eating behaviour of problem and non-problem feeders in a clinic setting. Observation of parent feeding practices and their child’s problematic eating behaviour confirmed that parents of problematic eaters were involved in a “coercive power struggle” in attempt to make their child eat (p. 71). By using coercion in the form of the contingent presentation of unpleasant events
(e.g., negative prompts/physical contact, negative instructions), parents tried to gain control of their child’s eating behaviour. In addition, this coercive struggle was self-perpetuating in that parent’s negative behaviour was intermittently reinforced by the child’s consumption of food. Although not documented, the authors suggested that this relationship was likely bidirectional in that parent aversive behaviour was predicted by child problem behaviour. If this is so, the relationship is consistent with one of the four-step patterns of coercion documented by Patterson and colleagues. In this case: (a) parent gives demand to eat non-preferred food; (b) child engages in food refusal behaviour; (c) parent escalates into aversive behaviour; and (d) child complies and eats the food. Such reciprocal exchanges of aversive behaviour teach the parent and child to use coercion to bring about desired behaviour changes in each other.

Further expansion of the work of Patterson and colleagues may be seen in a study conducted by Lucyshyn et al. (2004) in which the authors empirically investigated the construct of coercion (Patterson, 1982) in the daily routines of families raising young children with developmental disabilities and problem behaviour. Ten families of children with developmental disabilities and problem behaviour participated. The authors conducted videotaped observations of parent-child interactions in typical but problematic home routines. The observations were then later coded in real time and sequential analyses were conducted to test hypotheses about the presence of coercive processes. Results indicated the presence of attention-driven coercive processes in routines in which the parents were busy and unable to fully attend to their child (e.g., preparing dinner, doing household chores). The four steps in this pattern of interaction were: (a) parent is occupied; (b) child engages in problem behaviour; (c) parent delivers negative or positive attention; and (d) child terminates or reduces problem behaviour. In addition, results offered modest support for the presence of escape-driven coercive processes in routines in which
parent demands were common (e.g., dinnertime, homework). Importantly, for two families the dinner routine was identified as problematic and the children engaged in food refusal to escape the demand to eat non-preferred foods. For one of the two families, a moderated four-step coercive process was evidenced in which the parent, rather than withdraw the demand following problem behaviour, reduced the demand by responding with positive attention, negative attention, or physical help. The steps in this moderated coercive exchange were: (a) parent makes demand; (b) child engages in problem behaviour; (c) parent reduces demand; and (d) child terminates or reduces problem behaviour. In addition, in contrast to Patterson et al.’s (1992) and Sander et al’s (1993) work, Lucyshyn et al. (2004) reported that participating mothers did not escalate into aversive behaviour in response to their child’s persistent problem behaviour. These observations are consistent with the findings of Floyd and Phillippe (1993) in a comparative study of two-step coercive exchanges in families of children with and without mental retardation. Across two 50 minute videotaped sessions, the authors observed parent-child interactions during typical activities in the home (e.g., preparing dinner, eating, baking cookies). Results confirmed that even though the parents of children with mental retardation reported higher levels of problem behaviour than the comparison parents, they did not display higher rates of aversive behaviour when attempting to gain compliance from their child. Instead, they used clear requests and demands and were more likely to repeat the request or demand as compared to parents of typically developing children. Taken as a whole, this research suggests that the assessment of coercive processes and the design of interventions directly aimed at ameliorating coercive parent-child interactions is a second necessary condition for the survivability of behavioural interventions in family mealtime contexts.
Ecocultural Theory and the Activity Setting

Behavioural family interventionists have long recognized the importance of the social ecology that surrounds child behaviour and parent-child interaction (Lutzker & Campbell, 1994; Patterson et al., 1992; Sanders and Dadds, 1993). Failure to attend to ecological variables can result in lack of treatment adherence, negative side effects, or a loss of maintenance (Griest & Forehand, 1982). Ecocultural theory, developed by Gallimore and colleagues (Gallimore, Weisner, Kaufman & Bernheimer, 1989), provides an empirically-grounded theoretical framework for understanding the ecology of child development in the family. Ecocultural theory supposes that ecological (e.g., income, neighborhood, available services) and cultural influences (e.g., goals and values, beliefs, scripts of interaction) are mediated through the activity settings of daily routines in the home and community with family members. Activity settings are the routines of every day life (e.g., dinner, bedtime, visiting grandparents, religious services) in which parent-child interactions are embedded. The specific activities a child participates in during the day and the quality of interactions with family members has a profound impact on the child’s cognitive and communicative development. Proponents of the activity setting as a unit of analysis suggest that the most productive form of interaction in routines, “is a pattern of reciprocal participation in which each person may both assist and be assisted in the course of the activity” (O’Donnell & Tharp, 1990, p. 260). According to ecocultural theory, reciprocity motivates family members to persevere in their participation within a routine and also serves as the impetus toward more complex patterns of interactions. This increased complexity results in accelerated learning by the child as well as development of more sophisticated cognitive processes.
Through a process of accommodation, families proactively strive to construct activity settings that reflect child characteristics, family goals and values, and the constraints and opportunities in the environment (Berheimer & Keogh, 1995; Gallimore, Coots, Weisner, Garnier, & Guthrie, 1996). Activity settings are comprised of six elements: a) time and place, b) people present, c) resources, d) tasks and their organization, e) goals and values, and f) patterns of interactions. The way in which these elements are socially constructed represent instantiations of the larger ecological and cultural systems that surround the child and family (Gallimore, Goldenberg, Weisner, 1993; Weisner, 2002). Thus, the activity setting as a micro-context has its own integrity as an ecology that exists within a broader macro-ecology in which other ecological factors have influence.

I believe that the construct of the activity setting lends itself to the integration of child behaviour, parent-child interaction, and family ecology into a highly useful ecological unit of analysis and intervention. First, because child behaviour and parent-child interaction occur in activity settings, the functional analysis of problem behaviour and the assessment of coercive processes can easily be integrated into an assessment of activity settings (Lucyshyn et al., 2004). Second, activity settings include both objective (e.g., persons present, tasks, resources) and subjective elements (e.g., goals, values, beliefs about parenting and disability) and therefore provide an appropriate environment for designing contextually appropriate and culturally sensitive interventions in collaboration with families (Chen, Downing, & Peckham-Harding, 2002; Galimore et al., 1993). Given the growing diversity of families in the United States and Canada, the development of cultural competence in assessment and intervention planning is becoming an essential requirement of service delivery systems (Lynch & Hanson, 2004; Tharp, 1989). Third, the activity settings of daily life offer the interventionist an opportunity to embed
interventions within the core elements of specific family routines such as getting ready for school in the morning, having dinner with family members, or visiting a grandparent. Doing so with attention to contextual and cultural fit may increase the acceptability and feasibility of behavioural interventions to family members, improve the effectiveness and efficiency of behavioural parent training, and enhance the ability of family members to implement interventions with fidelity. Fourth, because the activity setting offers an expanded view of potential sources of variability that may affect child or parent behaviour (e.g., time and place; people present; tasks and their organization; parent goals, values, and beliefs) the long term maintenance of treatment outcomes may be enhanced by directly addressing these sources of variability while teaching parents to build successful activity settings (Gallimore, 2005; Lucyshyn et al., 2009; Moes & Frea, 2000; O’Donnell & Tharp, 1990).

Preliminary behavioural family intervention research that has used the activity setting as a unit of analysis suggests its importance in the design of acceptable, effective, contextually-appropriate, and durable interventions. In collaboration with one family of an adolescent with multiple disabilities and severe problem behaviour, Lucyshyn, Albin, and Nixon (1997) developed a multicomponent behaviour support plan that parents implemented in four routines in the home and community across a 26-month period. Two of the routines the parents selected for intervention were having dinner together as a family and eating at a neighborhood pizza restaurant. As part of the assessment and plan design process for each routine, the parents described their vision of a realistic and successful routine in terms of the six elements of an activity setting. This information then was used to contextualize the behaviour support plan for each routine. An experimental, multiple baseline design across the four routines indicated that the intervention effected an 88% reduction in serious problem behaviour and that these
improvements maintained and showed further gains at 3 and 9 months post-intervention. In addition, a contextual fit measure indicated that the parents evaluated the treatment plan as having a good fit with the family’s ecology.

Buschbacher, Fox, and Clarke (2004) conducted an experimental analysis of the efficacy of a parent-professional collaboration in the implementation of a positive behaviour support approach with a family of a young boy with Landau-Kleffner syndrome and severe problem behaviour. The family selected three problematic routines for intervention, one of which was dinner. Although the child was capable of eating a wide variety of foods, he was extremely disruptive at dinner (e.g., refusing to sit, hitting others, stealing food). Following functional assessment procedures, an individualized behaviour support plan was designed for each routine. An experimental multiple baseline design across settings evaluated outcomes. Results showed considerable improvement in child problem behaviour and task engagement across the three routines. Follow-up data showed that improvements maintained one year later.

Although many studies have reported the negative impact a child’s food refusal behaviour has on the quality of family mealtime routines (Franklin & Rodger, 2003; Luiselli, 2006; Secretz-Mertz et al., 1997), very few have addressed the immediate and distal social and physical ecology that surrounds a child’s eating behaviour. To date, most studies have described home-based feeding environments that closely resemble analog or artificially contrived settings established by the researchers. For example, studies include little if any description of the physical setting (e.g., time, place, frequency of meals, length of meals, family members present), even though many experts have suggested the importance of including such variables in the analysis of problematic feeding behaviour (Galensky et al., 2001; Levin & Carr, 2001; Werle et al., 1998). In addition, no study to date has assessed the impact of the larger social ecology on
the success of a feeding intervention. Indeed, many parents of children with food refusal behaviour report high levels of stress due to the pressures of attempting to implement impractical feeding interventions while also performing other routine-related tasks (Franklin & Rodger, 2003). Parents report that significantly more time is needed to feed the child who engages in food refusal. As a result, the parent has less time to attend to other family functions and needs (Secretz-Mertz et al., 1997). In addition, Secretz-Mertz et al., (1997) found that in most cases mothers received little support from other family members in making sure the child’s nutritional needs were met. Thus, rather than creating a new and competing feeding routine, their study suggests that it may be important that researchers and practitioners contextualize their interventions by embedding critical treatment components within existing or desired mealtime routines. Developing behaviour support strategies that fit well into the specific elements of family mealtime routines may allow parents to address other family functions during mealtimes and diminish stressors which negatively affect family members. Doing so will likely result in a more acceptable and feasible feeding intervention that is sustainable within the natural milieu of family life over a long period of time.

Werle, Murphy and Budd (1998) conducted the only feeding study to date that systematically assessed and manipulated contextual variables associated with the child’s problematic eating in a natural mealtime routine. Four parent-child dyads participated in the study. Contextual variables assessed included the setting in which eating occurred, seating arrangements for parent and child, frequency of meals and snacks, and length of meals. These contextual variables provided relevant information about the maintenance of feeding problems. Manipulation of these variables was associated with positive changes in child eating behaviour for two of the four dyads. The authors reported that addressing only physical elements of the
routine was insufficient for successfully supporting the other two parent-child dyads. For one parent, the intervention plan did not take into account stressors the parent experienced from outside professionals, leading the parent to drop out after the first stage of intervention. For the other parent, the authors hypothesized that inattention to cultural factors contributed to premature termination of the study. Given the considerations above, it appears that a third necessary condition for the design of survivable interventions in family mealtime contexts may be the analysis of family activity settings.

**Synthesis: Transforming Coercive Parent-Child Interaction in Mealtime Routines**

The primary objective of this study is to evaluate an approach to behavioural feeding intervention that integrates child eating behaviour, parent-child interaction, and the activity setting of mealtime routines into a uniquely useful ecological unit of analysis. The aim of this unit of analysis is to generate necessary and sufficient knowledge for the design of acceptable and effective interventions that parents can sustain across a variety of natural family mealtime contexts in the home and community over a long period of time. These may include breakfast, lunch or dinner at home with family members; occasional outings with one’s family to a favorite restaurant in the community; or yearly cultural events that include meals at the home of extended family members (e.g., Thanksgiving, Hanukah, Diwali, Christmas, New Year). To achieve these qualities of a survivable intervention, we believe that the goals and outcomes of behavioural intervention on child food refusal behaviour should be expanded from a univariate focus on changing child feeding behaviour to a multivariate focus on transforming coercive parent-child interactions in mealtime routines. Because this ecological unit of analysis expands the view of the sources of variability that affect child and parent behaviour during a feeding intervention (e.g., functions of child behaviour, reciprocal patterns of parent-child interaction, physical and
social ecology of activity settings), it has the potential to promote change that is more complete than is typically documented in behavioural intervention research or achieved by practitioners. By directly aiming to promote change that is ecological in scope, the term transformation is used to imply a change so complete that it is more likely to endure over time; that is, parents are more likely to continue using intervention components with fidelity, children are more likely to continue eating targeted foods as well as accept new non-trained foods, and parents and children are more likely to persist in these changes in the face of threats to maintenance because these sources of variability have been taken into account as part of the assessment and intervention process.

AN ECOLOGICAL APPROACH TO ASSESSMENT AND INTERVENTION FOR FOOD REFUSAL BEHAVIOUR

The following section describes an ecological model of assessment and intervention for families of children with food refusal behaviour. The approach evaluated in this study is an adaptation of a comprehensive family support approach developed by Lucyshyn and colleagues (Lucyshyn & Albin, 1993; Lucyshyn, Albin, & Nixon, 1997; Lucyshyn et al., 2007; Lucyshyn, Kayser, Irvin, & Blumberg, 2002). The approach has six steps: (a) referral; (b) comprehensive assessment; (c) plan design; (d) implementation support, including initial training and support and maintenance support; (e) continuous evaluation and plan improvement; and (f) follow-up support. A description of the steps in the process is presented below.

Referral

Referrals for behavioural feeding intervention may come from the family directly or from a medical or allied health professional such as a pediatrician, gastroenterologist, occupational therapist, or speech-language pathologist. These disciplines play an important role in supporting
children with feeding issues due to their extensive training in evaluating and treating medical reasons for the feeding problem or treating physical reasons for the feeding problem such as delayed or inadequate oral motor skills. Professionals in such disciplines have come to realize that even though oral motor deficits exist, behavioural resistance to the specific techniques used to improve oral motor skills may significantly interfere with the child making any progress in therapy (Linscheid, 2006). When a referral is received, the interventionist first completes a preliminary informal assessment with the allied professional to clearly identify the type of feeding problem. For example, does the child consume a limited range of foods or texture? Has the child been referred because he or she is having difficulty transitioning back to oral feeding after requiring a gastrostomy tube for a short period of time? Has the child failed to gain weight at an expected rate?

In addition, the interventionist conducts an informal assessment with the allied professional to determine whether the family is in crisis (e.g., marital conflict, sibling with behaviour problems, parent with a psychological disorder) and whether additional family interventions (e.g., marital counseling, behaviour support to sibling, psychotherapy for parent) may be necessary to promote meaningful and durable change. At this time, the interventionist, based on time and resources, determines if he or she can provide services to the family or whether to refer the family to another service provider. If a decision to provide behavioural support is made, the allied professional delivers a description of services to the family and requests they contact the interventionist. Families who contact the interventionist are invited to complete an initial interview.

During the initial interview, the interventionist informs the family about the support process, identifies key stakeholders beyond family members (e.g., occupational therapist,
speech-language pathologist) who will participate in assessment and planning activities, and negotiates an agreement for assessment and preliminary plan development.

During the interview, the interventionist also begins the development of a therapeutic alliance with the family (Kanfer & Grimm, 1980). The interventionist informs the family that they possess valuable knowledge needed to design a support plan, that the support effort will be guided by their values, and that the plan will build on their strengths. The family also is notified that the support effort will occur in the context of the natural family meal routines, and that the family will participate in the selection of meal routines, behavioural support procedures, and intensity and type of support activities. In providing this information, the interventionist hopes parents will see themselves as valued collaborators in the change process. The consultant also establishes positive expectations for change by sharing with the family the successes of other families with children who have similar feeding problems. Parents are often skeptical about their ability to change their child’s eating behaviour. By sharing anecdotes of other’s successes, the consultant sets the stage for the parents to start viewing themselves as capable of effecting change in their child and in themselves.

Comprehensive Assessment

The comprehensive assessment consists of four kinds of assessment: (a) behavioural feeding assessment; (b) functional assessment; (c) family ecology assessment; and (d) defining the instructional universe of foods assessment. All assessment activities are conducted in a family friendly manner. Interviews are collegial, relatively free of jargon, and respectful of the knowledge and expertise of the parent and other team members.

*Behavioural feeding assessment.* Given the uniqueness of food refusal behaviour (Werle et al., 1993), the process of assessment requires first an in depth understanding of the child’s
problematic feeding behaviours. Using the questionnaire developed by Budd (1992), information is gathered about the child’s past and current feeding patterns (e.g., feeding history, mealtime habits, daily meal schedule), parent’s perspective on how feeding problems developed (e.g., illness, surgery, allergic reaction), and the feeding strategies parents currently use in attempt to get their child to eat new foods. Information from this assessment is then used to design a feeding intervention that is precisely honed to the child’s particular feeding disorder and history of feeding problems.

Functional assessment. The next step in the assessment process is to conduct a functional assessment of the child’s food refusal behaviour and the coercive processes of parent-child interactions in meal routines. The functional assessment procedures help us understand the behavioural mechanisms that maintain child food refusal behaviour and ineffective parenting practices.

The functional assessment of child problem behaviour consists of a functional assessment interview and functional assessment observation(s). A functional assessment interview (FAI) is conducted using the interview form designed by O’Neill et al. (1997). The FAI includes questions about behaviours of concern, setting events that set the stage for problem behaviour, antecedent events that trigger problem behaviour, functions of problem behaviour, alternative communication skills in the child’s repertoire, and reinforcers.

After completion of the FAI, the interventionist in collaboration with the parents and other team members merge the information obtained from the functional assessment and behavioural feeding assessment to develop hypotheses regarding the function of problematic feeding behaviour. Discussions are collegial in nature, and aimed at reaching a consensus of the function of the behaviour, the events that trigger the behaviour and the events or situations that
increase the likelihood of positive behaviour (Lucyshyn et al., 2002). These hypotheses are then confirmed or disconfirmed during direct observations of meal routines, using the functional observation form developed by O’Neill et al. (1997).

To understand the effects of child behaviour on parent’s use of strategies, one additional question is asked during the functional assessment interview and one additional event is examined during direct observations: What does the child do after the parent withdraws or terminates the request or demand to eat? If the results of the interview and observation indicate that the child reliably terminates or reduces problem behaviour, then it is likely that a coercive process is in effect.

_Family ecology assessment._ Following the functional assessment, an interview is conducted to learn about the important characteristics of the family and features of the family’s ecology (Lucyshyn & Albin, 1993; Lucyshyn et al., 2002). Information from this interview is then used to design a behaviour support plan that is contextually appropriate from the family’s perspective. During the first half of the interview, the family responds to open-ended questions about family’s strengths and positive contributions of their child, the resources and social supports the family uses, sources of stress, and goals for the child and family.

During the second half of the interview, parents are asked to describe the daily/weekly meal routines that are valued yet most problematic. They also are asked to prioritize meal routines for intervention. Parents are encouraged to consider their resources, skills, time, and energy level when selecting meal routines for intervention. For example, a family with many resources and time may choose to work on a challenging family dinner routine because if it is improved, the family will experience an enhanced quality of life. Alternatively, another family with a busy schedule and limited energy and time may choose a lunch routine to intervene on
because the meals are simpler (i.e., less preparation) and fewer family members are home at that time.

After the parents have selected one or more meal routines for intervention, the interventionist asks the parents to describe their vision of a realistic but successful routine. The structure of this vision is guided by elements of an activity setting (Galimore, et al., 1993): (a) the time, place, and length of the meal routine; (b) the people who will be involved; (c) the material and social resources needed to make the meal successful; (d) the critical steps of the routine and how they will be sequenced and organized; (e) the goals and values of the family and child that will be reflected in the routine; and (f) the patterns of interaction that will occur between the child and parents, the child and siblings, and between the parents and siblings (Lucyshyn et al., 2002). Given that the structure of meals will naturally vary across a week or month (e.g., people present for dinner, the type of meal, setting), the vision may be more broadly defined to include such variations. This detailed vision of a successful meal routine then contributes to the design of a contextually appropriate behaviour support plan.

*Defining the instructional universe of foods assessment.* In addition, as part of the envisioned routine, parents are asked to describe the types of foods they wish their child to learn to eat. The generalization promotion strategy of general case programming is used to guide the selection of foods targeted during intervention (Horner & Albin, 1988). The first step in this process is to define the instructional universe of foods available to the child during the envisioned meal routine. After the instructional universe has been defined, the interventionist and family select foods that sample the range of stimulus properties and response requirements within the universe of foods. For example, foods selected for intervention may vary across the type of food (e.g., soups, vegetables, fruit, meat, pasta), texture (e.g., smooth, lumpy, crunchy),
appearance (colour, number of ingredients), temperature (e.g., cold, hot), and method of eating (e.g., fingers, fork or spoon, cut with a knife). The next step is to select examples from these foods to target during intervention. Since one food example does not possess all of the variations present in the instructional universe, several examples are selected that sample the range of stimulus variations and response requirements. The final step when using a general case programming strategy is to sequence the foods for intervention. Given the importance of maintaining a healthy balanced diet, foods selected within teaching sessions sample across at least three different food groups (e.g., fruits, vegetables, meat/meat alternatives, dairy, or grains). Across a series of meals, maximally different foods within each food group are selected and taught that sample the range of stimulus and response requirements of the defined instructional universe.

**Plan Design**

Guided by the information gathered from the comprehensive assessment, the interventionist collaborates with the family and team to develop a behaviour support plan that is technically sound and contextually appropriate for the family’s envisioned meal routine. The design process has four steps, described below.

1. **a) Build a summary statement/competing pathways diagram.** The first step in the design process is to use functional assessment results to build a summary statement/competing behaviour pathway diagram for the individual meal routine selected by the family. The diagram outlines the setting events; antecedent triggers; problem behaviours; and maintaining consequences (i.e., function) that are operating in the routine. The diagram also identifies desired behaviour for the routine and acceptable alternative replacement behaviour. The diagram guides
the design of a technically sound plan that renders problem behaviours irrelevant, ineffective, and inefficient at achieving their purpose (Horner, Albin, Todd, & Sprague, 2006).

b) Identify strategies logically linked to features of the problem in meal routine. For each feature of the problem in the pathways diagram for a routine (e.g., setting events, antecedent triggers, problem behaviour, maintaining consequences), a logical-linked behaviour support strategy is generated. Strategies are designed to make problem behaviours no longer functional and to make positive behaviour highly functional. Behaviour support strategies are selected from a broad class of empirically validated interventions. Behaviour support plans will include four categories of intervention: (a) setting event strategies; (b) preventative strategies; (c) teaching strategies; (d) consequence strategies. Within these broad categories, the specific behavioural mechanism operating to occasion or maintain problem behaviour will determine the specific strategy selected. The four intervention categories are described below:

1. Setting event strategies. For each setting event identified in the pathways diagram, a logically linked setting event strategy is selected. There are four categories: (a) eliminate or minimize the setting event; (b) neutralize the setting event; (c) if the setting event has occurred, reduce or remove the antecedent trigger for problem behaviour; and (d) increase the overall level of reinforcement (Horner, Vaughn, Day, & Ard, 1996). Common setting events strategies used with children with food refusal behaviour include: (a) no access to food or drink 2-3 hours prior to feeding intervention; (b) reduced demands to eat new foods when child is in an unresponsive state (e.g., ill, tired); (c) use of visual systems to increase predictability with feeding intervention (Levin & Carr; 2001; Linscheid, 2006; Luiselli, 2000).

2. Preventative Strategies. For each antecedent trigger, preventative strategies are selected. There are two broad categories: (a) eliminate or reduce antecedent stimuli that trigger
problem behaviour; and (b) enhance signals and prompts for desired behaviour and alternative replacement behaviour (Smith and Iwata, 1997). Common preventative strategies used with children with food refusal include: (a) stimulus fading procedure for texture or type of food; (b) demand fading procedure for number of bites expected to consume; (c) use of strategies to motivate eating behaviour (e.g., choice making, positive contingency) (Mueller, et al., 2004; Luiselli, 2000; Shore et al., 1998).

3. Teaching Strategies. Teaching strategies aim to promote the child’s self-sufficiency in performing (a) desired behaviour (e.g., tasks of the routine) and (b) alternative replacement behaviour (e.g., language skills that are functionally equivalent to problem behaviour) (Mirenda, MacGregor, & Kelly-Keough, 2002; Carr & Durand, 1985). The target meal routine and its competing behaviour pathways diagram determine the desired behaviour and alternative replacement behaviour to be taught. For example, in an escape driven dinner routine the desired behaviour typically involves eating new foods and sitting at the table until dinner is finished. An alternative replacement behaviour may be asking for a break from eating undesired food. Teaching strategies commonly used during problematic mealtime routines include: (a) functional communication training; and (b) prompting strategies to teach self-feeding (Williams & Foxx, 2007).

4. Consequence strategies. The purposes of consequence strategies are to: (a) reinforce desired and alternative replacement behaviour; and (b) eliminate or reduce problem behaviour (Piazza, Fisher, Roane, & Hilker, 1999). Accordingly, behaviour support plans include consequence strategies that: (a) positively reinforce desired behaviour; (b) positively or negatively reinforce alternative acceptable behaviour; (c) redirect low intensity problem behaviour; and (d) withhold and/or reduce reinforcement for moderate to high intensity problem
behaviour. Common strategies used with children with food refusal behaviour include: (a) offering a preferred item or event contingent on desired behaviour; (b) honouring a child’s appropriate request for a break; (c) actively ignoring mild problem behaviour and positively redirecting child to reengage in desired behaviour or use language to request want or need; and (d) withholding negative reinforcement for escape-motivated problem behaviour by using a non-removal of the spoon procedure (Ahearn et al., 2001; Palmer et al., 1975; Werle et al., 1993).

c. Finalize strategies that are likely to be effective and contextually appropriate. The interventionist and parents engage in two final steps to ensure the plan is technically sound, as simple as possible, and contextually appropriate. First, the parents and interventionist survey the proposed strategies and retain only those that are likely to be necessary and sufficient without comprising the effectiveness of the plan. Second, family ecology information is reviewed and strategies are adjusted to better fit the routine and family. Lucyshyn et al. (2002) suggest that answering questions related to elements of the family meal activity setting will help ensure the contextual appropriateness of the plan. Below are five questions of interest adapted from the work of Lucyshyn and colleagues (2002).

1. Do key implementers of the plan believe that the support plan strategies can be implemented during the time and place of the problematic meal routine?
2. Does the plan take into consideration all of the individuals present during the meal routine (e.g., siblings, extended family members, friends)?
3. Will the support plan strategies help the family achieve their goals for the child and the family as a whole during the meal routine?
4. Are the support plan strategies congruent with family values and beliefs that are part of the routine?
5. Does the plan adequately support child and family engagement in tasks of the meal routine, and are these tasks organized in a manner that supports the success of the routine?

Consideration of these questions may lead to additional changes to the behaviour support plan that can increase the likelihood of the parents successfully embedding the strategies into the targeted meal routine.

d. Develop implementation plan. The final step in the design process is to, in collaboration with the family, develop an implementation plan. The purpose of an implementation plan is to: (a) define the set of training materials and support activities that will be used to empower the parents to implement the behaviour support strategies; (b) delineate roles and responsibilities of all members of the support process; and (c) create a timeline for the length and intensity of the interventionist’s participation in the support process.

Implementation Support

There are three phases to implementation support: (a) intensive training with the interventionist; (b) initial training and support with parents; and (c) maintenance support. During implementation support, the interventionist develops and maintains a collaborative partnership with the parents. Within this partnership, the interventionist may assume many different roles that include leading the change process, teaching concepts and skills, empowering the parents, building a supportive relationship, translating complex ideas into procedures that are understandable and relevant to the family, and prophesying future relapses and positive expectations for improvement (Webster-Stratton & Herbert, 1993).

Intensive training with interventionist. During this phase of implementation, the interventionist initiates intensive training with the child typically in a location away from the
natural mealtime context. Training with the interventionist serves two purposes: (a) to bring child eating behaviour under the stimulus control of the interventionist and targeted foods; and (b) to set the stage for a transfer of stimulus control from the interventionist to the parent in the natural setting of the meal routine. Once the child is consistently consuming with minimal problem behaviour a range of foods from the family-defined instructional universe, the phase of initial training and support with the parent is initiated.

*Initial training and support with parent.* During this phase of implementation support, training and support activities serve three purposes: (a) to bring the child’s routine-related appropriate behaviours under stimulus control of the parent and the relevant features of the natural meal routine; (b) to build the parent’s capacity to use the strategies from the behaviour support plan effectively; and (c) to ensure that support procedures fit well with the routine.

During parent training and support, the interventionist implements a flexible but common set of behavioural parent training strategies. These activities include: (a) modeling and coaching; (b) behavioural rehearsal; (c) self-monitoring and self-management procedures; and (d) home meetings. These activities are described below:

*a) Modeling and coaching.* The interventionist provides in vivo support to the parent in the use of behaviour support strategies. First, while the parent is observing, the interventionist models the use of strategies and prompts the parent to model the interventionist’s social praise contingent on child’s acceptance of food. After one or two sessions of the child showing minimal problem behaviour in the presence of their parent, the interventionist then coaches the parent in the use of the feeding strategies. Coaching from the interventionist includes the use of prompts, feedback, and social reinforcement (O’Dell, 1985; Nay, 1975). Overtime, the interventionist
increases their distance from the parent and child until eventually the interventionist is out of view. At this time, the feeding session may be videotaped for later review with the parent.

Initial modeling and coaching of the procedures may occur in a training setting outside the natural meal routine. Once the parent is successful with feeding their child in this setting, the interventionist provides in vivo support to the parent in the natural setting. Stimuli in the natural environment that may compete with the child’s ability to accept the food are introduced in a step-wise fashion (e.g., other family members, foods available, visitors).

b) Behavioural rehearsal. The interventionist guides role-play activities in the home in which the parent practices the use of procedures under simulated conditions. Role-plays are an effective and efficient activity for teaching the actions and discriminations necessary to implement intervention effectively (Nay, 1975). In preparation for role-play sessions, the interventionist generates vignettes that sample the range of situations that necessitate the use of a strategy still weak in the parent’s repertoire or situations in which problem behaviour continues to occur. For each situation there are typically two role-play activities. In the first role-play, the interventionist models the procedure while the parent plays the role of the child. In the second role-play, the roles are reversed. During this role-play, the interventionist prompts, models and gives feedback until the parent demonstrates accurate implementation of the procedure (Sanders & Dadds, 1993).

c) Self-monitoring and self-management procedures. A self-evaluation form, called an implementation checklist, is used to promote the parent’s accurate use of the behaviour support strategies. The form is composed of a list of the support plan strategies and a 5-point Likert-type evaluation scale (1 = not in place; 5 = in place). The checklist serves as a prompt for families to carry out each procedure listed (Bergan & Kratochwill, 1990; Sanders & Dadds, 1993). The
checklist also helps to identify effective and ineffective procedures and thus facilitates plan revision. After each training session, the parent uses the checklist to self-monitor and self-manage plan implementation.

d) Home meetings. Meetings with family members in the home provide an opportunity to review progress, acknowledge successes, role-play specific support strategies, and discuss and solve problems in implementation fidelity or intervention effectiveness.

As the parent begins to take over implementation of the behavioural feeding plan, problems may arise. When a problem develops, an attempt is made to first identify its source. A support strategy may need to be modified because it was poorly designed and no longer effective. Alternatively, the parent may find it difficult to implement a specific strategy due to competing stimuli in the natural meal routine (e.g., other household responsibilities, pressure from other family members, parent negative thoughts). After the reason for the implementation problem has been identified, the interventionist works with the parents to find a solution that is acceptable to the parents and effective in improving child eating and routine related behaviours. For the interventionist, this also may include the use of clinical skills that address psychological processes informing parental resistance. Such skills include reframing, cognitive restructuring, and the therapeutic use of metaphor and self-disclosure (Lyddon, Clay, & Sparks, 2001; Webster-Stratton & Herbert, 1993).

Although home meeting length and frequency vary with each family, these meetings usually last for 1-2 hours and occur weekly or once every 2 weeks. Throughout initial training and support, activities with the family flex in frequency and length to accommodate changes in family schedule, motivation, and health. Once the parent is able to effect stable and meaningful
improvements in child consumption of new foods and participation in meal routines, the maintenance support phase is initiated.

**Maintenance Support**

The maintenance support phase begins with an initial meeting in which the interventionist and parents discuss the long-term maintenance of the child’s and family’s accomplishments. Three tasks are completed at this time. First, the interventionist and parents review the implementation checklist and retain only core strategies that are necessary to maintain improvements in child eating behaviour and routine participation.

Second, the interventionist and parent discuss obstacles to maintenance that could lead to regression and solutions that would help the parent continue to support their child effectively and build resilience to future setbacks. A relapse prevention plan customized to the family for preventing or self-correcting a relapse, is written and attached as an addendum to the behaviour support plan. A list of the relapse prevention strategies also is added to the revised implementation checklist. For example, obstacles to maintenance for one family may include the child becoming ill or developing dental problems that result in a loss of appetite. In this instance, a relapse prevention plan would involve the parent stopping the feeding intervention for the duration of the child’s illness or tooth problems. Once the child is feeling better, the parent would reinitiate the routine with smaller more manageable expectations for amount and type of food to be consumed.

Third, the interventionist in collaboration with the parents develops a brief self-monitoring tool to assess whether a coercive process has returned. The self-monitoring tool is composed of three yes/no type questions which specifically reflect the types of behaviour the child and parent characteristically engage in during previous coercive interactions. First, the
parent is asked to evaluate whether their child has engaged in problem behaviour during the last
week or so (e.g., During dinner did your child scream, push food away, or leave the table?). If
the answer is yes, the parent is then prompted to answer the next question regarding how the
parent responded to their child’s problem behaviour (e.g., In response to problem behaviour, did
you take the food away or give your child less food to eat?). If the answer is yes, the parent is
prompted to answer the final question concerning how their child responded after the parent
removed their demand or lessened the expectation to eat non-preferred food (e.g., After you
removed your demand, did your child’s behaviour improve or did problem behaviour decrease to
a more tolerable level?). By answering the questions at least once a week, the parent has an
opportunity to recognize if the previous coercive patterns of interaction have returned or not. If it
has, then the interventionist assists the family in taking steps to get back to a more positive and
constructive path with their child. If the coercive process has not returned the interventionist
offers positive feedback to the parent to reinforce their efforts to maintain a constructive
relationship with their child and to fortify them for future interactions.

The interventionist provides maintenance support to the family once every 2-3 weeks.
During maintenance support sessions, discussions focus on empowering the parent to become
self-sufficient in their use of support strategies and on preventing a relapse toward the coercive
process. To facilitate maintenance in the absence of the interventionist, the parents are
encouraged to once a week use the revised implementation checklist to self-monitor and self-
evaluate their use of the support strategies for maintaining improvements and preventing a
relapse. In addition, parents are encouraged to complete the coercive process assessment tool to
self-monitor and self-evaluate the potential re-occurrence of a coercive process in the targeted
meal routine. During maintenance support sessions, the interventionist reviews the completed
checklist and self-monitoring tool with the parents. These tools serve as a guide for evaluating the parent’s accurate and consistent use of strategies during the past few weeks and for determining whether progress in the routine has maintained. If there has been a relapse in progress, the interventionist and parents review the relapse prevention plan and determine whether the necessary strategies are in place to overcome this setback.

*Continuous Evaluation and Plan Improvement*

Multiple methods of evaluation are used to assess the outcomes of the behavioural feeding intervention (Meyers & Evans, 1993). These methods are designed to answer three central questions: (a) Has the plan promoted meaningful and durable behaviour change for the child? (b) Do parents and stakeholders use the behavioural support procedures effectively? and (c) Do family members perceive plan goals, procedures, and outcomes as acceptable, effective, and feasible?

Potential evaluation methods include (a) direct observation; (b) parent self-report measures such as implementation checklists, social validity questionnaires, and goodness-of-fit surveys; and (c) interviews with key informants (e.g., parents, siblings, occupational therapist). Methods of evaluation are selected during the team meeting and used continuously during implementation support. Information gained from evaluation data guides changes in implementation support activities, as well as revisions in child-centered and family-centered interventions. When the data aggregated from multiple methods indicate that the central goals of the support effort have been achieved, the interventionist begins to fade support. When the aggregated data indicate that a regression has occurred in child behaviour, parents are encouraged to identify the source of the problem and to use their relapse prevention tools (i.e., revised implementation checklist, coercive process assessment tool) to identify the problem’s
source and to solve it with minimal assistance from the interventionist. If parents are unable to solve the problem on their own, then the interventionist provides additional maintenance support as may be needed to overcome the regression.

*Follow-up Support*

Follow-up support begins after the parent demonstrates the ability to independently use their relapse prevention tools to recognize obstacles to long-term maintenance and prevent or overcome regressions in the meal routine. During follow-up, the interventionist fades contact and support to the family to once every three to six months. During this time, the family is encouraged to call the interventionist when problems re-emerge or new issues arise and the family is not able to solve these problems on their own. Sometimes these problems can be resolved through a series of phone consultations. Other times, a team meeting may be required to problem solve with the family and develop an addition to the relapse prevention plan. In some situations where child problem behaviour has regressed or support procedures have been neglected, a series of in vivo “booster” sessions may be necessary.

*Preliminary Findings on Ecological Behavioural Feeding Approach and Need For Further Research*

To date, one study has been conducted to evaluate the efficacy of the ecological behavioural feeding approach to the amelioration of food refusal behaviour in a child with autism (Binnendyk & Lucyshyn, 2009). The ecological approach was implemented with the child and his family in their home. The study employed an empirical case study design within one meal routine: snack time. Following implementation of training and support procedures with the child’s mother, results showed high levels of child food acceptance, successful child participation in the targeted snack routine, and high parental ratings of social validity and contextual fit. These improvements
maintained up to 26 months postintervention. Implementation of the support approach also was associated with generalized improvements in child eating behaviour to new foods and to the child’s father supporting him during the snack routine. In addition, improvements in child mealtime related behaviours were associated with parental reports of enhanced family quality of life.

Despite these encouraging preliminary results, the study had limitations. The empirical case study design did not control all threats to internal validity, such as history and maturation. Thus, the design did not allow for an unequivocal verification of a functional relationship between implementation of the ecological approach and improvements in child eating behaviour and routine participation. Also, the external validity of the study was limited in that the results were based on support to one child and family within one meal routine. Finally, the theoretical framework that informed the design and implementation of the ecological approach was limited in scope. Although observations during baseline suggested the presence of coercive processes of parent-child interaction, no measurement procedures were used to measure parent-child interaction, and no data analysis methods were employed to evaluate changes in patterns of parent-child interaction across baseline and intervention conditions. Thus, the study was limited to the measurement and analysis of changes in child behaviour rather than the larger ecological construct of coercive processes of parent-child interaction in family routines. Clearly, questions about the effectiveness of a behavioural feeding approach that integrates child eating behaviour, parent-child interaction, and the activity setting of mealtime routines into an ecological unit of analysis remain unanswered.

The purpose of this study was to provide preliminary answers to these questions. An experimental, non-concurrent multiple baseline design (Barlow & Hersen, 1988) across three
families was employed to: (a) more fully assess the efficacy of the ecological behavioural feeding approach; and (b) begin to address the generalizability of the approach to other families. To investigate the theoretical framework of the ecological approach: (a) parent-child interaction data were gathered across families; and (b) sequential analysis methods were employed to generate conditional probabilities of coercive and constructive processes in family meal routines across baseline and intervention phases.
RESEARCH PROBLEM

The purpose of the proposed research study is to determine the efficacy and acceptability of an ecological behavioural feeding approach. The study addresses two experimental and seven descriptive research questions:

1. Is there a functional relationship between implementation of an ecological behavioural feeding approach and: (a) decreases in the percentage of intervals of child problem behaviour; (b) increases in bites consumed per minute; and (c) increases in the percentage of steps successfully completed in meal routines?

2. Is there a statistically significant difference ($\rho < .05$) between baseline and intervention for each family in: (a) percentage of intervals of child problem behaviour; (b) bites consumed per minute; and (c) percentage of steps successfully completed in meal routines?

3. Is implementation of the ecological approach associated with maintenance of improvements in parent-child interaction, child behaviour, and routine participation for up to three months post-intervention?

4. In meal routines, will the conditional probability of parents and children engaging in escape-driven coercive processes of interaction comprised of the following four steps: (a) parent request/demand; (b) child problem behaviour; (c) parent terminates request/demand; and (d) child terminates problem behaviour, be statistically significant ($\rho < .05$) during baseline but not during intervention?

5. In meal routines, will the conditional probability of parents and children engaging in constructive processes comprised of the following four steps: (a) parent request/demand;
(b) child compliance; (c) parent positive behaviour; and (d) child appropriate behaviour, be statistically significant ($\rho < .05$) during intervention but not during baseline?

6. Is implementation of the ecological approach associated with high levels of parent accurate use of behaviour support strategies?

7. Is there an association between implementation of the ecological feeding approach and improvements in family quality of life and parenting stress?

8. Is the behaviour support plan socially valid from the parent’s point of view?

9. Does the behaviour support plan, from the family’s point of view, possess a “goodness of fit” with the family’s ecology?
CHAPTER 2
RESEARCH METHODOLOGY

Participants

Three families of children with developmental disabilities and severe food refusal behaviour participated in the study. Family participants were recruited through organizations (e.g., Family Centred Practices Group, Linking Autism and Families) that support children with developmental disabilities and their families in the lower mainland of British Columbia. The organization representative distributed to prospective families an introductory letter providing an overview of the study (see Appendix A) and how to contact the experimenter if interested in participating in the study. Families who contacted the experimenter were invited to provide informed consent for participation in the initial screening process (see Appendix B). The screening process included a brief interview about child problem behaviour during meal routines and pilot observations to verify problem behaviour in meal routines. Children and families that met the following criteria were invited to participate in the study: (a) the focus child had a formal diagnosis of a developmental disability (e.g., autism, PDD-NOS) and/or mental retardation; (b) the focus child engaged in severe food refusal behaviour (i.e., feeding problems persisted for 15-50 months and the parent had virtually given up trying to get their child to eat new foods); (c) the child was between the ages of 3-8 years old; (d) the child’s food refusal behaviour was not a result of organic factors (e.g., physiological abnormalities, gastrointestinal problems, allergies); (e) the parents did not perceive themselves to be in “crisis” due to family issues that were unrelated to the focus of the study (e.g., sibling with a behaviour disorder, marriage in crisis, parent with a psychological disorder); (f) both parents spoke sufficient English to ensure that the supports would be understood and potentially helpful; (g) the parents agreed to allow an observer...
to videotape meal routines in the home; and (h) initial screening observations of at least one family meal routine in the home provided clinical evidence of the presence of an escape-driven coercive patterns of parent-child interaction. All three families agreed to participate and completed informed consent forms (see Appendix C). For each family, the mother was the primary participant throughout the research and family support process.

Robbie is a five-year old boy with a diagnosis of autism spectrum disorder. Robbie is an only child in a two parent, middle class Caucasian family. His mother a chartered accountant, worked part-time from home and also served as Robbie’s primary caregiver. His father worked long hours as a set designer for a local movie production company. Results from a standardized test administered by a speech-language pathologist rated Robbie’s receptive language consistent with a mild delay (i.e., 4 years 4 months) and his expressive language within normal limits for his age, with the exception abstract reasoning (3 years 9 months). Robbie is toilet trained for urination but not bowel movements. Robbie is independent in all other self-care activities. Foods Robbie was consistently eating at the time of the study included, macaroni and cheese, baked beans, cereal with milk, crackers, pancakes, French toast, banana, and apple.

Luke is a four-year 10-month old boy diagnosed with autism spectrum disorder, low tone, global developmental delay, and a seizure disorder. Luke is the youngest in a middle class Caucasian family. He lives at home with his older brother (age 8) and his two parents. His mother stays at home as the primary caregiver and his father, a trained lawyer, returned to work one month after the study began after a two-year stress leave. Luke’s cognitive functioning is moderately delayed. Results from a standardized test administered by a speech-language pathologist rated Luke’s receptive understanding consistent with a moderate delay (3 years 6 months to 3 years 11 months) and his expressive language consistent with a mild delay (4 years
to 4 years 5 months). Luke is not toilet trained yet he is independent in other self-care activities such as washing hands, brushing teeth, getting dressed, and feeding self. At the time of the study Luke refused to eat any foods offered to him by his parents. At home he consumed 4-5 bottles a day of milk, which his mother supplemented with Pediasure® in order to maintain proper health and nutrition. Alternatively, at preschool, Luke was reported to have a healthy diet, eating a wide variety of foods (e.g., meats, vegetables, fruits) offered to him by his teacher.

Josh is a five-year old boy diagnosed with autism spectrum disorder, Marfan’s syndrome, and Type 1 diabetes. Josh is the oldest in a middle class, Caucasian family. He lives at home with his younger brother (age 2), and his two parents. His mother stays at home as the primary caregiver while his father works full-time as a computer-programmer consulting to large corporations. Josh’s cognitive functioning is within normal limits. Assessment findings from his speech-language pathologist rate Josh above average in his receptive understanding and at age level in his expressive language skills. When the study began, foods John consistently consumed were potato chips and cookies. To maintain proper nutrition and manage Josh’s blood sugar levels, his parents supplemented his diet with 4-5 glasses of a Glucerna®, a milk product specially designed for diabetics.

For the duration of the study, in addition to two years prior to it, the children attended their community preschool. Also, the children and their families participated a minimum of 15 hours a week in a community based intervention program based on the principles of applied behaviour analysis. The aim of each child’s behavioural intervention program was to promote the development of skills in the areas of communication, play, socialization, self-care, and early academics.
**Settings**

The study was conducted within two settings for each child and family: (a) an in vivo routine setting with the family; and (b) a training setting with the interventionist. The primary setting was a home-based meal routine (e.g., breakfast, lunch, snack, dinner). Meal routines were selected and defined in close collaboration with participating families. Specific criteria for selection of a meal routine included: (a) the routine was typical and valued by the family; (b) during initial screening and pilot observations, the routine was consistently unsuccessful due to child problem behaviour; and (c) during initial screening and pilot observations the four-step escape driven coercive process was observed (i.e., parent demand to eat new food, child problem behaviour, parent terminates their demand, child terminates problem behaviour). Robbie’s family and Luke’s family chose a dinner routine for assessment and intervention. Robbie’s mother chose a dinner routine. Given Robbie’s hectic schedule of preschool and early intervention, his mother reported that dinner was the only meal during the day when there was sufficient time to implement the feeding intervention. Luke’s mother chose a dinner routine because she believed that improving this routine would have the greatest impact on their family’s overall quality of life. A major goal for Luke’s mom was for her family to spend more time together doing fun and relaxing activities. She viewed dinner time as the perfect context for achieving such a goal.

Josh’s mother chose a snack routine. Mindful of how resistant Josh was to trying new foods, she thought that he might have more success in expanding his diet in a snack routine, given that portion sizes are typically small and foods served are often simple (e.g., yoghurt, crackers and cheese, grapes).

The training with interventionist setting also occurred in the home but not within the defined family meal routine. The experimenter collaborated with each family to identify the
training setting. Specific criteria for selection of the training setting included: (a) discriminative stimuli that have in the past occasioned food refusal behaviour were not present (e.g., parents, dinner table); (b) the setting was free of stimuli that might interfere with the interventionist acquiring stimulus control over the child’s eating behaviour (e.g., siblings present, sounds from television, computer in view). Intensive training with Luke and Robbie occurred in the routine setting (kitchen and dining room respectively); however, for both children common distracters such as television and computer were turned off and no family members were present. Intensive training with Josh occurred at a small table in the living room.

Measurement

The study used multiple measurement procedures to monitor the dependent variables and to document implementation of the independent variable. These measurement procedures are described below.

Clinical Confirmation of the Coercive Process and Design of a Break Procedure

Prior to conducting experimental baseline, a break procedure was developed with each family. The purpose of the break procedure was to reduce parent reactivity to the observation protocol in which a parent is asked to do the envisioned routine 5 to 8 times or for 5 to 15 minutes. As observed by Lucyshyn et al. (2004) in their study of coercive processes in family routines in which parent demands are common and escape driven coercive processes were hypothesized to exist, parents tended to persist with routine related demands while being videotaped and to terminate their demands only after the observer ended the observation session. Partly due to this reactivity, measurement of the classic escape-driven coercive process documented by Patterson and his colleagues (e.g., parent demand-child problem behaviour-
parent withdraws demand-child terminates problem behaviour; Patterson, 1982) was not replicated in the Lucyshyn et al. (2004) study.

To correct this reactivity, in a subsequent longitudinal intervention study with families of children with developmental disabilities and problem behaviour, Lucyshyn and colleagues (Lucyshyn et al., 2007) developed a break procedure. The break procedure involved a series of steps that were designed to ensure that naturally occurring escape-driven coercive processes were observed in family routines in which parent demands are common.

Consistent with the procedure developed by Lucyshyn and colleagues (2007), the following set of steps to define a break procedure were implemented. First, after initial screening observations with families provided clinical evidence of the presence of an escape-driven coercive pattern of interaction during the targeted meal routine, the experimenter met with each family to develop the break procedure. The experimenter asked the parent to describe what they do during a meal routine after they present a non-preferred food to the child and the child engages in problem behaviour. Given the prior careful screening process, it was anticipated that parents would respond by describing, in their own words, the action of terminating the demand and/or withdrawing the food. For example, one parent said that she would “give up” or “give her son what he wants (e.g., bottle of milk)”. Parents were then asked to describe what they do in specific behavioural terms. With this question, parents replied, for example, that they go back to eating their own food and/or they give the child a preferred food to eat. These parent behaviours then become the operational definition of a break procedure.

Direct Videotaped Observation Sessions and Procedures

A trained observer using a digital video camera observed and recorded parent and child behaviour and interaction in meal routines. The observer implemented guidelines for home-based
observations described by Patterson (1982) (e.g., no visitors; refrain from using the phone, no talking to the observer during videotaping). Observation probes were conducted during baseline, intervention (initial training and support; and maintenance support), and follow-up phases. Observations were conducted at regular intervals (i.e., every second or third day during baseline; every third or fourth training session during intervention) until stable behavioural patterns were evidenced (e.g., stable, high percentage of problem behaviours during baseline; stable low percentage of problem behaviours during intervention phases). A total of 59 observations were completed across three families over a period of 13 months. Each family participated in approximately 20 observations across baseline, intervention, and follow-up phases. Each observation lasted 10 minutes to 1 hour. Observation sessions occurred at the naturally occurring time of the routine, and were scheduled on a day that was convenient for each of the families. To ensure parent and child safety during the observations, a definition of dangerous behaviour that would require the immediate termination of the observation session was established with each family. In this study, the dangerous behaviour was physical aggression, defined as the child engaging in behaviours directed at others that may potentially cause the person pain or injury (e.g., hitting, kicking, throwing items at person).

During an observation session, the observer reviewed with the parent the operational definition of the envisioned routine and ensured that material resources and the general structure of the routine were present. The observer then asked the parent to try and do the home meal routine at least 5 to 8 times or alternatively for 5 to 15 minutes. The parent also was reminded that they could take a break during the observation session whenever they would naturally do so (i.e., if the observer was not present). When the parent initiated a break, they signaled to the observer their intention by either looking at the observer or making a hand signal. The observer
acknowledged that the parent had initiated a break by either nodding her head or returning the
hand signal. The observer then continued videotaping parent and child behaviour for an additional
30 seconds to 2 minutes and then put the camera on “standby” to initiate a break. After a few
minutes, the observer asked the parent to, whenever they were ready, try to do the routine again.
When the parent acknowledged that they were ready, the observer put the camera on “record” and
resumed videotaping the parent’s attempt to engage the target child in the routine. The
observation session continued until the parent had attempted to do the routine 5-8 times or after
10-15 minutes, after the routine was completed, or a dangerous behaviour had occurred.

Coding Videotaped Observation Sessions

Preliminary analysis of individual family data indicated that 10-12 observations per phase
(i.e., baseline and intervention) were sufficient to meet the parametric assumptions of a normal
distribution upon which sequential analyses are based (see Bakeman & Quera, 1997). For this
reason, a random sample of 10 observations, stratified across families, was selected for baseline
coding. A random sample of 10 observations, stratified across families, was also selected for
intervention coding. Ten minutes of each observation were coded for parent and child
behaviours. For all sessions that lasted more than 15 minutes, coding began at the five-minute
mark. For sessions that were 10 minutes or shorter, the entire observation was coded.

Microcomputer-Based Data Coding Equipment and Software

An IBM compatible desktop computer with a video monitor was used to collect data from
each videotaped session. A computer software program, Observer Video-Pro software (Noldus,
Thrienes, Hendriksen, Jansen, & Jansen, 2000) was used to code parent-child interactions. The
software provides a system for observing and coding child and parent behaviour in real time.
Digital video data was directly downloaded into a folder in the hard drive of the computer and
given a media file suffix (“mpeg”). When coding an observation session, a trained coder entered the Observer Video-Pro software program, selected a media file for coding, and coded parent and child behaviour directly from a viewing box on the computer screen. In addition to the viewing box, the customized screen included an event log, a video control panel, and a coding category panel.

Trained coders used the Parent and Child Coding System (PACCS) (Lucyshyn, Laverty, Boonstra, Irvin, Sprague, & Horner, 2007) to code parent and child interaction during family meal routines in the home. Prior to coding, categories were entered into an observer configuration file for the study and appeared as three-letter agent-action codes (e.g., Parent Request/Demand = PRD) in the code panel on the computer screen. The observer watched the observation session in the viewing box and used the computer keyboard and a jog/shuttle to click on codes that represented the onset of specific parent and child behaviour categories. The computer keyboard and jog/shuttle allowed the coder to pause, rewind, or fast-forward the observation session in synchronization with the ongoing coding process. After an observation was coded, it was saved as an observation data file (odf file) in a folder on the hard drive.

A computer software observation program, Windows Media Player was used to code child behaviour (i.e., percentage of intervals of problem behaviour, routine steps successfully completed, rate of bites accepted) and parent implementation fidelity (i.e., percentage of intervals of parent accurate use of support plan procedures). When coding an observation session, a trained coder entered the Windows Media Player software program, selected a file for coding, and coded child behaviour and parent implementation fidelity directly from the computer screen. Data sheets and pencil were used to record the occurrence and/or non-occurrence of child behaviour and parent accurate use of strategies.
Dependent Variables

Eight dependent variables were measured to assess the internal validity, external validity, and social validity of the independent variable: (a) percentage of intervals of problem behaviour; (b) bites consumed per minute; (c) percentage of steps successfully completed in routine; (d) conditional probability of coercive processes and of constructive processes; (e) percentage of intervals of parent’s accurate use of behaviour support plan strategies; (f) average rating of the social validity of the support effort; (g) average index of the support plan’s “goodness-of-fit” with the family’s ecology; and (h) family functioning scores from the Family Quality of Life Survey (Park et al., 2003) and Parenting Stress Index (PSI) (Abidin, 1995; Lloyd & Abidin, 1984).

Problem Behaviour

Problem behaviours included the following nine categories: (a) food refusal; (b) negative vocalizations; (c) physical aggression; (d) disruptive/destructive behaviours; (e) tantrums; (f) physical resistance to parent physical assistance; (g) elopement; (h) out of assigned area; and (i) non-compliance. Food refusal included protesting, asking for food not served at meals, turning head or body away from spoon, keeping lips tightly closed, covering mouth with hands or arms, pushing spoon or plate away, spitting out food, removing food from plate or spoon, gagging, and/or vomiting. Negative vocalizations included whimpering, whining, crying, screaming, and yelling. Physical aggression included hitting, kicking, pulling hair, and/or throwing objects at another person. Disruptive/destructive behaviour included throwing objects, knocking objects off table, playing with food, and/or playing with utensils. Tantrums were defined as screaming, crying, falling to the ground and/or physically resisting assistance provided by the parent. Physical resistance to parent physical assistance included
pushing or pulling away from parent, arching back, sliding down and out of parent’s grasp, grabbing arm to stop parent, and/or pushing parent away. Elopement was defined as running away from the table or parent. Out of assigned area was defined as the child out of the assigned area but engaging in acceptable behaviour. Non-compliance was defined as after a parent request/demand unrelated to eating food (e.g., “come and sit down”, “wipe your mouth”, “take a sip of water”), the child did not initiate compliance to the request/demand within 10 seconds. Problem behaviour was measured as the percentage of intervals of occurrence during the targeted meal routine. A partial interval recording system was used with an observation interval of 10 seconds (Richard, Taylor, Ramasamy, & Richards, 1999). An occurrence was scored if a target behaviour occurred at any point during the interval. The percentage of intervals of problem behaviour was calculated by dividing the number of intervals of problem behaviour by the total number of intervals and then multiplying that figure by 100.

*Bites of Food Consumed During Routine*

A bite of food consumed was defined as the child accepting a bite of food (either by being fed by the parent or by self-feeding) and swallowing the food item (i.e., no visible food in mouth). Bites of food consumed were measured as the number of bites consumed per minute during the routine. The number of bites consumed was calculated by counting the total number of bites consumed and dividing the total by the number of minutes the meal lasted.

*Steps Completed in Routine*

The definition of steps successfully completed was developed individually for each child and in collaboration with the child’s parents. First, the experimenter and each family identified and defined the steps in the routine. See Table 2.1 for the steps in each child’s targeted meal routine. Second, for steps that had a criterion level of performance (e.g., amount of food
consumed) we defined the criterion (e.g., eats all of food on plate). Third, for steps that could occur one or more times (e.g., use a napkin, engage in conversation) the step was defined and one or more occurrence of the step was defined as successful. Fourth, we determined the level of problem behaviour that must occur during a step to render that step unsuccessful. Problem behaviours ranged from minor (e.g., non-compliance, whining) to major (e.g., vomiting, aggression, shouting) and were defined by the parent. Depending on the step, if a minor behaviour occurred three to five times during a step then the step was scored as unsuccessful; if one to three major behaviours occurred during a step, then the step was scored as unsuccessful. Finally the parents and the experimenter determined the level of independence required by the child before a step was scored as successfully completed. For children with significant developmental disabilities this level of independence was set lower. For example, if the child completed the step with verbal, gestural, or physical help; as long as they did not engage in a criterion level of problem behaviour, the step was scored as successful. For higher functioning children, this level was typically set higher. For example, if the child completed the step with verbal or gestural assistance it was considered successful. However if the child completed the step with physical assistance, it was considered unsuccessful.

Using a checklist of the steps and a definition of the criterion level of problem behaviour and independence, the coder recorded whether a step was successfully completed, not completed, or an opportunity to engage in the step was not provided (e.g., the parent did not prompt the child to drink from a cup). Steps completed were measured as the percentage of steps completed during the routine. The percentage of steps completed was calculated by dividing the number of steps completed by the total number of steps in the routine then multiplied by 100.
Table 2.1.

Steps Completed in Routine

<table>
<thead>
<tr>
<th>Routine</th>
<th>Robbie</th>
<th>Luke</th>
<th>Josh</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Dinner</td>
<td>• Dinner</td>
<td>• Snack</td>
</tr>
<tr>
<td>Steps</td>
<td>1. When requested, stops what he’s doing and goes to the bathroom to wash his hands</td>
<td>1. When requested, comes to the kitchen and sits down at the table</td>
<td>1. When requested, comes to kitchen/dining room and sits down at the table</td>
</tr>
<tr>
<td></td>
<td>2. Brings cup to the table</td>
<td>2. Eats all of his food</td>
<td>2. Eats all of his food</td>
</tr>
<tr>
<td></td>
<td>4. Eats all food</td>
<td>4. Uses napkin</td>
<td>4. Uses napkin</td>
</tr>
<tr>
<td></td>
<td>5. Stays seated for entire meal</td>
<td>5. Uses utensils for non-finger foods</td>
<td>5. Uses utensils for non-finger foods</td>
</tr>
<tr>
<td></td>
<td>6. Uses napkin</td>
<td>6. Converses with family members</td>
<td>6. Converses with family members</td>
</tr>
<tr>
<td></td>
<td>7. Uses utensils for non-finger foods</td>
<td>7. When plate is empty, asks to be excused</td>
<td>7. Puts cup and plate in the sink</td>
</tr>
<tr>
<td></td>
<td>8. Converses with family members</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>9. When plate is empty, asks to be excused</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10. Puts cup and plate in sink</td>
<td></td>
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</tr>
</tbody>
</table>

Coercive Processes

The Parent and Child Coding System (PACCS) (Lucyshyn et al., 2007) was used to generate conditional probabilities of coercive and constructive processes in family routines. PACCS was developed using guidelines described by Bakeman and Gottman (1997) for designing observational methods for the sequential analysis of dyadic interaction. PACCS consists of 19 parent and child coding categories and their constituent defining codes. There are 9 parent codes and 10 child codes. Codes are organized in a hierarchy for both members of the dyad. The hierarchy allows a coder to select the most salient code when a parent or child is simultaneously engaged in two behaviour categories (e.g., parent delivering praise while wiping the table). The coding system is based on a turn-taking scheme. It is designed to be sensitive to
changes in behaviour categories within one person's turn and across turns between parent and child. The hierarchy of parent categories, with agent-action codes in parentheses, is as follows:
(a) Negative Attention (PNA); (b) Request/Demand (PRD); (c) Reduced Request/Demand; (d) Positive Attention (PPA); (e) Physical Assistance (PAS); (f) Non-Comply (PNC); (g) Comply (PCO); (h) Other Behaviour (POT); and (i) Occupied (POC). The hierarchy of child code categories, with agent-action codes in parentheses, is as follows: (a) Problem Behaviour (CPB); (b) Problem Behaviour with Non-Compliance (CPN); (c) Problem Behaviour with Compliance (CPC); (d) Non-Comply (CNC); (e) Comply (CCO); (f) Out of Assigned Area (COA); (g) Appropriate Request/Demand (CRD); (h) Positive Attention (CPA); (i) Other Behaviour (COT); and (j) Occupied (COC).

Coercive patterns of interaction were defined for routines in which the child sought negative reinforcement—that is, escape from demand to eat non-preferred food. Because of the statistical need for a large N of parent-child interaction, this was an aggregate measure across families. Coded observation sessions were aggregated in conformance with the multiple baseline design. Observations that shared the same research phase (i.e., baseline, intervention) were aggregated into one data file. One aggregate data file was composed of ten randomly sampled observation sessions in the baseline phase across the three families. The second aggregate file was composed of ten randomly sampled observation sessions in the intervention phase across the three families. Conditional probabilities were generated by posing a series of questions using the following general format: Given the occurrence of a criterion event, what is the conditional probability of a target event? The questions represented the first two, the first three, and the full four steps in a coercive pattern of parent-child interaction during escape driven meal routines as defined below:
a. Given a parent demand, what is the conditional probability that a child will engage in problem behaviour?

b. Given a parent demand followed by child problem behaviour, what is the conditional probability that the parent will withdraw their demand?

c. Given a parent demand followed by child problem behaviour, what is the conditional probability that the parent will withdraw demand, and the child will terminate problem behaviour?

*Constructive Processes*

PACCS also was used to generate conditional probabilities of constructive processes in family routines. Constructive processes also were defined for routines in which the child, during the baseline phase, sought negative reinforcement—that is, escape from demands to eat non-preferred foods. The observation sessions that were randomly sampled and aggregated across families by research phase to generate conditional probabilities of coercive processes also were used to generate conditional probabilities about constructive processes. Conditional probabilities were again generated by posing questions about the occurrence of a target event given a criterion event. However these questions represented the first two, the first three, and the full four steps in a constructive pattern of parent-child interaction, as defined below.

a. Given a parent request/demand, what is the conditional probability that the child will comply to the request/demand (e.g., accept and consume non-preferred food)?

b. Given a parent demand, followed by child compliance, what is the conditional probability that the parent will provide positive attention?
c. Given a parent demand, followed by child compliance, what is the conditional probability that the parent will provide positive attention and the child will respond with appropriate behaviour?

Questions about sequential relationships between parent and child behaviour were answered by using the GSW sequential analysis program (Quera & Bakeman, 2000). For each question about coercive and constructive patterns of interaction, GSW for Windows generated conditional probabilities within a $2 \times 2$ contingency table. Always, one behaviour (or behaviour pattern) serve as antecedent to the other behaviour or sequential pattern. For instance, for the first two-steps in a coercive escape-driven process, Parent Request/Demand (PRD) was cross-tabulated with Child Problem Behaviour (CPB). Analyzing the behaviour sequences in a contingency table structure, conditional probabilities generated by SDIS/GSEQ (Bakeman and Quera, 1995) are empirically determined based on the obtained data for each family. Table 2.2 below lists the 6 dependent measures.
Table 2.2.

Dependent Variables and Dependent Measures

<table>
<thead>
<tr>
<th>Dependent Variable: Process/Routine/Steps</th>
<th>Dependent Measure: Conditional Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Coercive/Escape-Driven/2-Step</td>
<td>Child Problem Behaviour</td>
</tr>
<tr>
<td>2. Coercive/Escape-Driven/3-Step</td>
<td>Parent Withdraw Demand</td>
</tr>
<tr>
<td>4. Constructive/2-Step</td>
<td>Child Compliance</td>
</tr>
<tr>
<td>5. Constructive/3-Step</td>
<td>Parent Positive Attention</td>
</tr>
<tr>
<td>6. Constructive/4-Step</td>
<td>Parent Positive Attention &amp; Child Appropriate Behaviour</td>
</tr>
</tbody>
</table>

Parent Implementation Fidelity of Support Strategies

Parent implementation fidelity was defined as accurate implementation of the following ten behaviour support strategies (see Table 2.3): (a) visual support strategies (Luiselli, 2000); (b) choice making; (c) stimulus fading of amount of food (Kerwin, Ahearn, Eicher, & Burd, 1995; Shore et al., 1998); (d) positive contingency statements; (e) simultaneous presentation of preferred and non-preferred food (Kern & Marder, 1996); (f) teach alternative replacement behaviour (break) (Carr & Durand, 1985; Mirenda et al., 2002); (g) contingent praise (Anderson & McMillan, 2001; Piazza, Patel, Gullota, Sevin, & Layer, 2003); (h) contingent preferred toy or food (Najdowksi et al., 2003); (i) escape extinction procedure (Ahearn et al., 2001; Palmer, et al., 1975; Werle et al., 1993); and (j) de-escalation procedure. These ten strategies constituted the core set of strategies used by each mother during their targeted meal routine. Twenty percent of treatment sessions were scored for each mother’s accurate use of the support strategies.
Definitions of accurate and inaccurate use were generated after the plan of intervention was developed. Parent behaviour was scored as the percentage of intervals of accurate implementation. The length of the interval was thirty seconds. Given that an escape extinction procedure takes longer to implement than do other strategies in the plan, a 30 second interval was considered a reasonable length of time to measure the mother’s use of this procedure, in addition to other procedures in the plan. An occurrence was scored if accurate use of a support strategy occurred at any point during the interval. The percentage of intervals of accurate implementation was calculated by dividing the number of intervals the parent exhibited accurate use of the support strategies by the total number of intervals and then multiplying by 100.
<table>
<thead>
<tr>
<th>Strategy</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Visually mediated contingency</td>
<td>The parent uses a visually mediated positive contingency with the child. The contingency differs depending on how successful the child is at eating the targeted foods. For example, if the child is just learning to eat a new food and is required to eat four bites, four pictures of the new food are placed on the picture schedule, each picture representing one bite of food. For a child that can read simple words, the type of food is written on a piece of paper and four boxes are drawn, each box representing one bite of food. Alternatively, if the child is able to eat a nutritionally appropriate portion of food, one picture symbol of that food will be placed on the schedule, with that one picture symbol representing the whole plate/dish of food. For a child that can read, one box will be drawn beside the food word, with that one box representing the entire portion of food. The use of visual strategies is scored only if (a) the visually mediated positive contingency is reviewed with the child before presenting him with the food; (b) the parent shows the child that a bite or dish of food has been consumed by removing the picture symbol from the picture sequence or crossing off the word/box.</td>
</tr>
<tr>
<td>2. Stimulus fading of amount of food</td>
<td>The parent teaches the child to eat new non-preferred foods, by presenting the child with a small number of pea-sized amount bites of food. The use of a stimulus fading procedure is scored if when presenting the child with a new food the parent presents 1-3 pea-sized bites of a new food. Each bite of food presented to the child is scored as correct. The strategy is scored as incorrect if in the midst of problem behaviour the parent responds by decreasing the size or number of bites.</td>
</tr>
<tr>
<td>3. Offer choices</td>
<td>Before and during the meal, the parent offers the child choices. Choices can be big (e.g., type of food, type of reinforcer, number of bites, order in which the child eats the food), or small (e.g., type of condiment, utensil or dish used, number of chews before getting the reinforcer). Each choice offered by the parent is scored. This strategy is scored as incorrect if a choice is offered after a significant problem behaviour occur.</td>
</tr>
<tr>
<td>4. Simultaneous presentation of preferred and non-preferred</td>
<td>The parent teaches the child to eat new or difficult foods by offering the bite of food simultaneous with a preferred food (e.g., chocolate, chip, piece of cookie) or a preferred condiment or spread (e.g., ketchup, dip, peanut butter, or cream cheese). This may involve: (a) the</td>
</tr>
<tr>
<td>Strategy</td>
<td>Description</td>
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<td>parent presenting the bite of food and reinforcer together on the same spoon; (b) the parent giving the child the reinforcer in the child’s hand as the parent places the non-preferred food in the child’s mouth; (c) the parent putting the non-preferred food in the child’s mouth, followed immediately with the reinforcer; or (d) the parent puts a dab of spread or dip on the bite of non-preferred food before presenting it to the child. Each bite of food paired with a preferred food is scored. This strategy is scored as incorrect if the parent first gives the child the food reinforcer before presenting the non-preferred food.</td>
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</table>
| The parent tells the child what behavior(s) he needs to do, and the positive reinforcer he will get after engaging in the behaviour(s) (i.e., “finish your food and then you can [get reinforcer]”). The reinforcer can be a preferred food (e.g., brownie, ice cream sandwich, chocolate), or activity (play computer, play board game). A positive contingency statement is only scored when the contingency statement is made before a significant problem behaviour occurs.  
   a. Examples: “Eat banana and yoghurt and then you can go play outside”  
   b. Nonexample: “Eat your food because it tastes good” “What do you want as your treat?” |
<p>| The parent teaches the child an alternative replacement behaviour—asking for a break. Prompting the child to request a break is scored when (a) at the beginning of the meal the parent reminds the child if he needs a break to just ask at any time during the meal; (b) in response to minor problem behaviours, the parent prompts the child to request a break (e.g., “ask me for a break”). Honouring the child’s request for a break is scored when the parent responds to the child’s request by (a) permitting him to leave the table for a few minutes; (b) moving the child’s plate away or putting the child’s fork down; (c) requesting the child do something for the parent before earning the break (“finish your vegetables and then you can take a break”). The strategy is scored as incorrect if the child requests a break and is denied by the parent (e.g., “no”, “not now”, “Nope, you need to finish eating”). |
| The parent offers praise contingent on desirable behavior (within 3 seconds). Praise may comprise an evaluative comment and/or descriptive comment. Praise statements may include a statement of what the child did and what he gets. Each independent phrase or sentence of praise is scored. The strategy is scored as incorrect if a praiseful statement is delivered after the child engages in problem |</p>
<table>
<thead>
<tr>
<th>Strategy</th>
<th>Description</th>
</tr>
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</table>
| behaviours or errorful performance. Also, this strategy is scored as incorrect if the child is not actually engaged in the behaviour that is descriptively praised. | a. Examples: “Good eating! You ate all of your apple”, “You are doing such a good job eating all on your own”  
b. Nonexamples: “Good eating” after the child has put the spoon up to his mouth but did not deposit the food into his mouth. “That’s okay try again”, after the child has spit the food out onto the floor. |
| 8. Contingent access to preferred toy/food    | The parent delivers a preferred toy/activity/food (e.g., card game, story, trivia game) contingent on the child consuming a bite of food or a targeted amount of food. Each time the parent delivers a preferred toy/activity/food, the strategy is scored. The strategy is scored as incorrect if the parent delivers a preferred toy/activity/food after the child engages in problem behaviour or errorful performance. |
| 9. Escape extinction procedure                | In response to child’s food refusal behaviour, the escape extinction procedure is scored if the parent continues to present the bite of food, repeating the demand “take a bite” every 30 seconds until the food is accepted and consumed. If the child expels the food, the parent presents another spoonful of the same food to the child until accepted and consumed. The parent ignores the child if he engages in minor problem behavior (e.g., turning head, pushing spoon away, crying or screaming) and redirects him to the task (e.g., eat your food). The strategy is scored as incorrect if the parent in response to problem behaviour withdraws her demand to eat the food by: (a) putting the spoon/fork down; (b) taking the food off the child’s plate; or (c) offering a bite of a different food. |
| 10. De-escalation procedure                   | The de-escalation procedure is scored if parent minimizes reinforcement for major problem behavior by doing one or more of the following: (a) moving away from aggression; (b) ignoring throwing and redirecting; (c) calmly blocking leaving seat and redirecting when calm (d) if child leaves the table, not following the child. Instead, once the child settled, approaching the child and calmly delivering a warning about loss of privilege if the child does not return to the table and eat his food. Then, counting to five to allow the child time to transition back to the table. If the child escalates more than three times, terminating the meal. |
Social Validation

The social validity of the intervention approach was measured by administering a questionnaire to the each mother, once during the initial training phase of intervention, once during the maintenance phase of intervention, and once during follow-up. The mothers were asked to answer a series of questions that were rated on a Likert-type scale from 1 to 5 (1 = disagree; 5 = agree). The questionnaire assessed the mothers’ evaluation of the acceptability and importance of intervention goals, procedures, and outcomes. For each of the mother’s evaluation, an average social validity rating across 10 items was computed, and this average was used as a formative index of social validity. Across three evaluations, a grand average was computed, which provided a summative index of social validity. During these computations, ratings for items 3 and 7, which had reverse scoring for acceptability and importance, were converted to reflect the same direction of importance and/or acceptability. The social validity form is presented in Appendix D.

Goodness-of-Fit Measure

The “goodness-of-fit” assessment questionnaire, composed of 12 items, is designed to evaluate how well the behaviour support plan fits with the ecology of the family (Albin, Lucyshyn, Horner, & Flannery, 1996). The items sample five parameters relevant to goodness-of-fit: (a) goals and expectations (e.g., “Does the plan address your highest priority goals?”); (b) congruence to lifestyle (e.g., “Does the plan disrupt the time of day to the point that stress and hardship will be created?”); (c) implementation effort (e.g., “All things considered how difficult will it be for you to implement the plan?”); and (d) sustainability (e.g., “If the plan is effective, do you believe you can continue to use the strategies for a long time?”). Mothers rated each item using a 5-point Likert scale (e.g., 1 = little; 5 = a lot). The questionnaire was administered twice
during the initial training phase of intervention, once during the maintenance phase of intervention, and once during follow up. For each of the mother’s evaluation, an average rating across the 18 items was calculated, and was used as a formative index of goodness-of-fit. Across four indices of goodness-of-fit, a grand average was computed and served as a summative index of goodness-of-fit. During these calculations, ratings for items 12 and 16, which had reverse scoring for goodness-of-fit, were converted to reflect the same interpretation as the other 16 items. The goodness-of-fit survey form is presented in Appendix E.

Family Functioning Measures

Family functioning was measured using two family assessment instruments: (a) Family Quality of Life Survey (Park et al., 2003); and (b) the Parenting Stress Index (PSI) (Lloyd & Abidin, 1984). The assessment instruments, described below, were administered to the three mothers participating in the study once during the baseline phase and once during follow up.

Family Quality of Life Survey. The Beach Center Family Quality of Life Survey (Park et al., 2003) comprises 41 items that assess five family quality-of-life domains: family interaction, parenting, emotional well-being, physical/material well-being, and disability related support. For each item, parents rate the level of importance and satisfaction on a Likert-type scale (1 = a little important, 5 = critically important). Psychometric evaluations of the instrument has shown that it possess excellent reliability (Cronbach alpha of .94 on importance ratings and .88 on satisfaction ratings) and concurrent validity (correlation coefficients of .68 and .60, \( p < .001 \)) with well established measures of quality of life (Hoffman, Marquis, Poston, Summers, & Turnbull, 2006; Park et al., 2003).

Parenting Stress Index (PSI). The PSI (Lloyd & Abidin, 1984) is a 120 item self-report questionnaire designed to measure the relative magnitude of stress in the parent-child dyad.
Items are scored on a 1-6 Likert scale, ranging from 0 (strongly disagree) to 5 (strongly agree). Items are arranged in a child domain and parent domain. Items in the child domain measure those characteristics of the child that make parenting difficult. Items in the parent domain measure those characteristics of the parent and the family context that are sources of stress or represent potential dysfunction of the parent-child system (Abidin, 1995). From a normative sample of 2,633 mothers, the PSI has been standardized for use with parents of children one to twelve years of age. Parent responses generate a total stress score that is converted to a percentile score, which is derived from the frequency distribution of the normative sample. Total Stress scores between the 15th and 80th percentile are normal and scores at or above the 85th percentile are considered high. The Parent Stress Index total scale and subscales have shown high internal consistency (Cronbach alpha of .90 or greater for the parent and child domain and the total stress scale). The instrument has a stable three-factor structure (i.e., child domain, parent domain, total stress) and strong construct and predictive validity as evidenced by many studies (Abidin, 1995).

**Observer Agreement**

Two coders (Lauren Binnendyk and a fellow student) participated in approximately 10 hours of training in the coding of child-related dependent variables (e.g., child problem behaviour, steps completed, bites consumed) prior to measurement of baseline data. A training criterion of 85% agreement on two consecutive pilot observations was required before coding began. To maintain high levels of agreement for child-related dependent variables, the coders met bi-monthly for review training sessions using previously coded observation files. During an interobserver agreement session, the two coders independently observed and coded the videotaped session at different times.
Lauren Binnendyk and a second coder participated in 40 hours of training in coding parent and child interaction data using the PACCS coding system (Lucyshyn et al., 2007). A training criterion of 85% agreement on two consecutive pilot observations was required before coding began. To maintain high levels of agreement for parent and child interaction data, coders posed questions in the comment section of the observation file for parent and/or child behaviour that they found difficult to interpret and for which the coding manual did not provide adequate direction. After the coding of a file, the coder attended a consensus meeting with the primary coder, Lauren Binnendyk, to pose these questions and come to an agreement regarding the appropriate way to code the behaviour and/or interaction. The questions were limited to no more than 10% of any observation file. The purpose of the consensus meeting was to ensure the accuracy of the coding and the calibration of coding between coders when parent and child behaviour were highly nuanced, subtle, or complex and the PACCS coding manual did not provide sufficient direction for what to do in these instances. This is a common procedure among research teams coding dyadic interactions in real time because of the complexity of such interaction and the inability of a coding manual to define every possible nuance of parent and child behaviour and interaction (J. Lucyshyn, personal communication, May 21, 2007; M. Stoolmiller, personal communication, August 7, 2006). During an interobserver agreement session, the two coders independently observed and coded the videotaped session at different times. All interobserver agreement scores were calculated prior to a consensus meeting between the two coders.

**Problem Behaviour**

For percentage of intervals of problem behaviour, interobserver agreement checks were completed an average of 34% of probe sessions per family, balanced across phases. Observer
agreement for problem behaviour during the meal routine was calculated using the following formula: the total number of agreements divided by the number of agreements plus disagreements, multiplied by 100. An agreement was considered when two coders recorded the occurrence of a target behaviour(s), during the same 10-second interval. For Robbie, the average agreement for problem behaviour was 94% (range, 75 - 99%). For Luke, the average interobserver agreement for problem behaviour was 96% (range, 91 - 98%). For Josh, the average interobserver agreement for problem behaviour was 95% (range, 88 - 99%).

**Bites of Food Consumed During Routine**

For bites of food consumed, interobserver agreement checks were completed an average of 34% of probe sessions per family, balanced across phases. Observer agreement for bites of food consumed was calculated using the following formula: the total number of agreements divided by the number of agreements plus disagreements, multiplied by 100. An agreement was considered when two coders recorded the same number of bites consumed during the same 10-second interval. For Robbie, the average agreement for bites consumed was 88% (range, 79 - 100%). For Luke, the average interobserver agreement for bites consumed was 94% (range, 72 - 100%). For Josh, the average interobserver agreement for bites consumed was 92% (range, 81 - 100%).

**Steps Completed**

For steps completed, interobserver agreement checks were completed an average of 34% of probe sessions per family, balanced across phases. Observer agreement for percentage of steps completed was calculated using the following formula: the total number of agreements divided by the number of disagreements, multiplied by 100. An agreement was considered when two independent coders recorded the same step successfully completed, not completed,
or as having no opportunity, during the same trial. For Robbie, the average agreement for steps completed was 92% (range, 80 - 100%). For Luke, the average interobserver agreement for steps completed was 97% (range, 88 - 100%). For Josh, the average interobserver agreement for steps completed was 98% (range, 88 - 100%).

Coercive and Constructive Processes Data

For data measuring coercive and constructive processes, interobserver agreement sessions were held for 20 percent of observation sessions balanced across families and routines. To compute interobserver agreement across all behaviour codes (parent and child) the Observer software program’s interobserver agreement analysis function was used (Noldus, et al., 2000). The formula used was total agreement \( \times 2 \div \text{Total Codes by Coder 1} + \text{Total Codes by Coder 2} \) (Bakeman & Gottman, 1997). In addition, interobserver agreement data for all behaviour codes (parent and child) was converted to a Kappa statistic (k) to control for non-occurrence agreements and disagreements (Bakeman & Gottman, 1997; Cohen, 1977). The formula for calculating the Kappa statistic is as follows: 

\[
k = \frac{(Oa - Ea)}{(N - Ea)}
\]

where Oa is the observed count of agreement, Ea is the expected count of agreement, and N is the total. Overall agreement across parent and child behaviours was 82%. Overall Kappa was .80. The overall percentage of agreement for parent behaviours was 91%. For individual parent behaviours, percentage agreement was as follows: 88% for negative attention, 95% for request/demand, 92% for positive attention, 88% for physical assistance, 0% for non-compliance, 52% for compliance, 93% for other behaviour, and 94% for occupied.

The overall percentage agreement between two independent observers was 89% for child behaviours. For individual child behaviours, percentage agreement was as follows: 88% for problem behaviour, 62% for problem behaviour with compliance, 97% for problem behaviour
with non-compliance, 57% for non-compliance, 84% for out of assigned area, 94% for compliance, 73% for request/demand, 0% for positive attention, 90% for other behaviour, and 92% for occupied. Codes in which there were zero percentages of agreement were due to the infrequent occurrence of such codes. Specifically, only one behavioural event was observed to occur for parent non-compliance (PNC) and for child positive attention (CPA).

**Parent Implementation Fidelity**

Because we could not define parent’s accurate use of behaviour support procedures before the support plan was designed, observer training for coding parent implementation fidelity began during the intervention phase of the study. After receiving detailed operational definitions of support procedures, two coders participated in approximately 10 additional hours of training. A training criterion of 85% agreement across two consecutive pilot observations was required before coding began.

Observer agreement for parent implementation fidelity was calculated using the following formula: the total number of agreements divided by the number of agreements plus disagreements, multiplied by 100. An agreement was considered when two observers recorded the occurrence of a target behaviour(s) during the same 30-second interval. Agreement checks for parent implementation fidelity were completed an average of 33% of probe sessions per family, balanced across intervention and follow-up phases. The average agreement for parent implementation fidelity was 85% (range, 80 – 92%).

**Research Design**

Two experimental designs were employed. A brief description of each design is described below.
Multielement Design

During assessment of each child’s problem behaviour, a functional analysis was completed to verify hypotheses about the function of food refusal and related mealtime problem behaviours. A multi-element design that alternates rapidly between conditions as a means of demonstrating experimental control was used. In this design, antecedent and consequent conditions hypothesized to control behaviour were alternated within a series of brief observations (e.g., 5 minutes). The degree of differentiation in the levels of problem behaviour by condition determined the extent to which hypotheses about behavioural functions were confirmed or not. The specific hypotheses tested for each child and the procedures used are described below in the procedures section.

Nonconcurrent Multiple Baseline Design

A single subject, experimental research design were used to evaluate the efficacy of the ecological behavioural feeding intervention approach for improving child and parent behaviour in valued meal routines. The study employed a nonconcurrent multiple baseline design across three families using a multiple probe strategy (Barlow & Hersen, 1988; Harvey, May, & Kennedy, 2004; Horner & Baer, 1978). The design had three phases: (a) baseline; (b) intervention, composed of initial training/support and maintenance support; and (c) follow-up. A nonconcurrent multiple baseline design is similar to a concurrent multiple baseline design in that experimental control is based on evaluating behaviour across different baselines (e.g., people, settings) (Harvey et al, 2004). However, with a nonconcurrent multiple baseline design, the data are not collected simultaneously—that is, each participant is not simultaneously available for baseline and intervention. Instead, prior to conducting the study, the experimenter determines the length of each baseline and ensures that each baseline length is unequal (e.g., 5, 7, 9). When a
given participant becomes available, the participant is randomly assigned to one of the predetermined baseline lengths. Baseline observations are then conducted and assuming a stable pattern of behaviour is evidenced, the intervention is implemented at the pre-determined point in time (Barlow, Nock, & Hersen, 2009).

Using a nonconcurrent multiple baseline has several merits. First because unequal baseline lengths are randomly assigned to participants and the implementation of the intervention is planned, the design allows for demonstration of an experimental effect (Harvey, et al., 2004). Second, the design permits maximum flexibility and individualization in the introduction of baseline, intervention, and follow-up phases. Third, the design limits the amount of time participating families have to wait for intervention. This is important considering the severity of the children’s food refusal behaviour. If left untreated, many children with severe food refusal are at risk for malnutrition and delayed development (Secretz-Mertz et al., 1997).

Research and Intervention Procedures

The behavioural intervention approach was implemented in the context of a nonconcurrent multiple baseline design across three family meal routines. L. Binnendyk served as the primary interventionist throughout the study, conducting or coordinating all assessments and collaborating with each family on intervention development and implementation activities. Because intervention procedures (i.e., the independent variable) were described in detail in Chapter 1, this section will focus on the sequence of research procedures and clinical family support procedures that occurred in the study.

Preliminary Screening Assessment

Preliminary screening assessment activities were conducted to determine whether or not the child’s problematic feeding behaviour warranted the need for an intensive intervention for
food refusal, whether the parent and child engage in a four-step escape driven coercive interaction, and to establish a structured baseline across three routines (Davis, Turner, Rolider, & Cartwright, 1994). I first administered the Behavioural Feeding Assessment Parent Interview (Budd, 1992). The interview took place in the family’s home and was approximately 60 minutes in length. During the interview, the parents answered semi-structured, open-ended questions about their child’s feeding history, mealtime habits, current feeding problems, and current feeding techniques used by the parents. The results of the behavioural feeding assessment are summarized below.

Robbie’s parents reported that Robbie’s feeding problems began after he transitioned to solid foods around the age of 15 months. In order to get Robbie to eat as a toddler, his mother would sit him in a high chair and distract him with television. From the age of 2 to 5, Robbie’s mother continued to introduce new foods and although challenging at times, Robbie began to develop a preference for certain foods. At the time of the study, during the dinner routine, Robbie regularly accepted macaroni and cheese, baked beans, bananas, and apples. Foods Robbie accepted at one time but was no longer accepting included peas and pears. His mother indicated that they occasionally tried to prompt consumption of new foods, but were unsuccessful in expanding his diet. As a result, Robbie’s mother stopped trying to get Robbie to try new foods and instead solely provided him with preferred foods. Most of Robbie’s eating occurred in brief bouts during the day and he almost never sat for meals unless his parents distracted him with television.

Luke’s mother reported that Luke’s feeding problems had begun at approximately the age of two and remained constant throughout his early childhood years. As a toddler, Luke transitioned well to solid foods. He was reported to have a healthy diet including a variety of
fruits, vegetables, and dairy products. Around the age of two, however, Luke began to refuse foods until eventually all he would accept were bottles of milk which his mother mixed with Pediasure®-- a nutritional supplement designed to provide children with calories, vitamins, and minerals missing from their daily diet. Surprisingly, there was no illness, accident or traumatic event that may have accounted for the sudden change in Luke’s eating behaviour. From the age of two to four, Luke’s mother continued to try and prompt consumption of new foods, but to no avail. Concurrently, during Luke’s second year at preschool, with little support from his teachers, Luke began to eat most foods served to him at snack. His teachers hypothesized that Luke was highly motivated by the presence of his peers to participate in snack and eat the same foods they were eating. Unfortunately, the eating success Luke experienced at preschool did not generalize to home. At the time of the study, Luke’s primary source of calories and nutrients at home was 4-5 bottles of milk and Pediasure®. On weekends and holidays when there was no opportunity for Luke to eat a snack at preschool, his entire diet was milk and Pediasure®. Due to the high volume of milk consumed during the week, Luke was easily constipated, requiring that his mother give him an enema once a week. Given that Luke did not eat food at home, there was no expectation for him to come to the table and sit with the rest of the family during mealtimes.

Josh’s parents reported that Josh’s feeding problems had begun from the moment he was introduced to infant pureed foods and remained constant throughout his early childhood years. Josh’s mother reported that both parents tried a number of strategies including forced feeding, rewards, distraction with toys or television, and coaxing in attempt to get Josh to try new foods. Each strategy was met with limited success in that the only foods Josh was willing to eat were crackers, chips, and cookies. At the time of the study, Josh was regularly eating several different types of chips, crackers and cookies, in addition to drinking 5-6 glasses a day.
of Glucerna®; a milk based product designed to maintain blood sugar levels for individuals with diabetes. Due to Josh’s limited diet, he required a daily dose of PEG-3350 (polyethylene glycol electrolyte solution), a laxative solution that increases the amount of water in the intestinal tract to stimulate bowel movements. At the time of the study, Josh had a bowel movement once every week to ten days. Josh ate all meals at the kitchen table at regular times of day. Overall, the behavioural feeding assessment for all three children confirmed the perception that persistent and serious food related problem behaviours occurred during meal routines at home.

After the behavioural feeding assessment was completed, each family collaborated with the experimenter to identify and prioritize a meal routine in the home (e.g., lunch, dinner, snack) that was valued yet problematic. Luke’s mother and Robbie’s mother selected dinner. Josh’s mother chose a snack routine. After the meal routine was selected for intervention, the families collaborated with the experimenter to define the content and structure of a successful meal setting.

The interview took approximately 30 minutes to complete. Definitions of the envisioned meal routine were guided by the concept of an activity setting and its six elements, as described by Gallimore and his colleagues (Gallimore et al., 1989). Specifically each family was asked to describe: (a) the time, place, and envisioned length of the meal routine; (b) the people who would be involved; (c) the material resources that would be used; (d) the steps of the routine and how they would be organized; (e) the family’s goals, values, and beliefs that would inform the routine; and (f) common patterns of interaction that would occur during the meal routine. Additionally, guided by the logic of a general case programming instructional strategy (Horner & Albin, 1988), the parents defined an instructional universe of foods that they would like their child to eat during the meal routine. Parents were asked to choose twelve foods, three foods from each of the major
food groups (fruits, vegetables, meat/meat alternatives, grains). The experimenter assisted the family in selecting foods that closely approximated the range of stimuli and response requirements that would occur during meals in the home (e.g., roasted chicken, rice, apple slices, and broccoli).

The envisioned routine that emerged from this process was summarized into a one-page operational definition. Each family reviewed each definition, evaluated its accuracy, and if necessary suggested adjustments or corrections. The finalized definition was then used to structure the family’s implementation of the meal routine during baseline, intervention, and follow-up phases. Defining the routines prior to baseline procedures ensured the comparability of observation sessions across phases (Davis et al., 1994; Lucyshyn, Albin, & Nixon, 1997). Each family’s envisioned routine is summarized in Table 2.4.

Following the routine assessment interview, a brief functional assessment (Cipani & Schock, 2007) was conducted to determine if the parent and child engaged in a four-step escape driven coercive interaction. The interventionist asked each parent a number of specific questions to help discern possible functional relationships between the child’s problematic feeding behaviours and current maintaining contingencies. For example, “Is problem behaviour more reliably to occur during meals when you are not paying attention to your child or when you request that he eat a new food?” “When your child engages in problem behaviours during meals, does he reliably get your attention?” “Do other family members also give him attention when he engages in problem behaviour?” “When he refuses a new food, do you or someone else give him a preferred food instead?” “Will your child continue to engage in problem behaviour until you remove the food or stop asking him to take a bite?” Results from the brief functional assessment
suggested that all three children engaged in escape motivated problem behaviour during mealtime routines.

Following the interviews, the experimenter conducted one or two pilot observations in the defined routines to confirm the presence of a four-step escape driven coercive interaction. The observations also served to reduce reactivity by the child to videotaped observation sessions. Information from the preliminary screening assessment was then incorporated into the comprehensive assessment.
Table 2.4

Families’ Vision of a Successful Meal Routine

<table>
<thead>
<tr>
<th>Routine</th>
<th>Robbie</th>
<th>Luke</th>
<th>Josh</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time/Setting/Length/Persons Present</td>
<td>6:30 pm</td>
<td>5:30 pm</td>
<td>2:00 pm</td>
</tr>
<tr>
<td></td>
<td>Dinner</td>
<td>Dinner</td>
<td>Snack</td>
</tr>
<tr>
<td></td>
<td>Dining room</td>
<td>Kitchen</td>
<td>Kitchen or dining room</td>
</tr>
<tr>
<td></td>
<td>30 minutes</td>
<td>30 minutes</td>
<td>15-20 minutes</td>
</tr>
<tr>
<td></td>
<td>Mother and father (if home from work)</td>
<td>Mother, older brother, father (if home from work)</td>
<td>Mother and baby brother</td>
</tr>
<tr>
<td>Resources</td>
<td>dishes, utensils</td>
<td>dishes, utensils</td>
<td>dishes, utensils</td>
</tr>
<tr>
<td></td>
<td>healthy foods</td>
<td>healthy foods</td>
<td>healthy foods</td>
</tr>
<tr>
<td></td>
<td>cup of water</td>
<td>cup of water</td>
<td>cup of water</td>
</tr>
<tr>
<td></td>
<td>napkin</td>
<td>napkin</td>
<td>napkin</td>
</tr>
<tr>
<td></td>
<td>placemat</td>
<td>placemat</td>
<td>placemat</td>
</tr>
<tr>
<td></td>
<td>adjustable chair with footstool</td>
<td>adjustable chair with footstool</td>
<td>adjustable chair with footstool</td>
</tr>
<tr>
<td>Targeted Foods</td>
<td>carrots, peas, broccoli</td>
<td>carrots, red pepper, celery</td>
<td>carrots, avocado, cucumber</td>
</tr>
<tr>
<td></td>
<td>grapes, watermelon, strawberries</td>
<td>grapes, apple, banana</td>
<td>apple, banana, grapes</td>
</tr>
<tr>
<td></td>
<td>tortellini, pizza, rice</td>
<td>tortellini, lasagna, rice</td>
<td>crackers with spread (nutella, cream cheese, peanut butter), tortilla with peanut butter</td>
</tr>
<tr>
<td></td>
<td>chicken, fish sticks, hamburger</td>
<td>meatballs, chicken, ham</td>
<td>tofu hotdog, turkey bacon, cheese, peanuts</td>
</tr>
<tr>
<td>Child and Sibling’s Tasks</td>
<td>stop what he’s doing</td>
<td>come and sit down when requested</td>
<td>come and sit down when requested</td>
</tr>
<tr>
<td></td>
<td>wash his hands</td>
<td>eat all of his food</td>
<td>eat all of his food</td>
</tr>
<tr>
<td></td>
<td>bring cup to the table</td>
<td>stay seated for entire meal</td>
<td>stay seated for entire meal</td>
</tr>
<tr>
<td></td>
<td>sit down when requested</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Robbie</td>
<td>Luke</td>
<td>Josh</td>
<td></td>
</tr>
<tr>
<td>--------</td>
<td>------</td>
<td>------</td>
<td></td>
</tr>
<tr>
<td>• eat all of his food</td>
<td>• ask for more if necessary</td>
<td>• ask for more if necessary</td>
<td></td>
</tr>
<tr>
<td>• stay seated for entire meal</td>
<td>• use napkin</td>
<td>• use napkin</td>
<td></td>
</tr>
<tr>
<td>• ask for more if necessary</td>
<td>• use utensils</td>
<td>• use utensils</td>
<td></td>
</tr>
<tr>
<td>• use napkin</td>
<td>• converse with family</td>
<td>• converse with family</td>
<td></td>
</tr>
<tr>
<td>• use utensils</td>
<td>• ask to be excused</td>
<td>• put cup and plate in sink</td>
<td></td>
</tr>
<tr>
<td>• converse with family</td>
<td>• put cup and plate in sink</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parent’s Tasks</td>
<td>Parent’s Tasks</td>
<td>Parent’s Tasks</td>
<td></td>
</tr>
<tr>
<td>• serve food on plates</td>
<td>• serve food on plates</td>
<td>• serve food on plates</td>
<td></td>
</tr>
<tr>
<td>• eat and drink</td>
<td>• eat and drink</td>
<td>• sit between children</td>
<td></td>
</tr>
<tr>
<td>• respond to Robbie’s requests</td>
<td>• respond to children’s requests</td>
<td>• talk with children</td>
<td></td>
</tr>
<tr>
<td>• mom support Robbie to stay seated and eat his food</td>
<td>• mom support Luke to stay seated and eat his food</td>
<td>• respond to children’s requests</td>
<td></td>
</tr>
<tr>
<td>• talk with family members</td>
<td>• dad when present support other son to stay seated and eat his food</td>
<td>• remind Josh as needed to put dish and cup in sink</td>
<td></td>
</tr>
<tr>
<td>• dismiss Robbie after he asks to leave</td>
<td>• talk with family members</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• remind Robbie as needed to put dish and cup in sink</td>
<td>• dismiss children after they ask to leave</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child and Family Goals</td>
<td>Child and Family Goals</td>
<td>Child and Family Goals</td>
<td></td>
</tr>
<tr>
<td>• expand son’s diet to include vegetables and meat</td>
<td>• eat at a proper time of night</td>
<td>• expand son’s diet to include foods from all major food groups</td>
<td></td>
</tr>
<tr>
<td>• eat dinner with out using television as a distracter</td>
<td>• eat nutritious foods</td>
<td>• learn about mealtime etiquette</td>
<td></td>
</tr>
<tr>
<td>• eat a portion of the meal that the rest of the family is eating</td>
<td>• Luke participate in dinner with family and experience self as a part of the family</td>
<td>• use utensils</td>
<td></td>
</tr>
<tr>
<td>• generalize eating new foods to eating a restaurant</td>
<td>• strengthen family unity by eating dinner together</td>
<td>• have a relaxing time together while eating food</td>
<td></td>
</tr>
<tr>
<td>• use positive parenting strategies</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• generalize dinner strategies to supporting son in a restaurant</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patterns of Social Interaction</td>
<td>Patterns of Social Interaction</td>
<td>Patterns of Social Interaction</td>
<td></td>
</tr>
<tr>
<td>• listening to parents and complying</td>
<td>• listening to parents and complying</td>
<td>• listening to parents and complying</td>
<td></td>
</tr>
<tr>
<td>Robbie</td>
<td>Luke</td>
<td>Josh</td>
<td></td>
</tr>
<tr>
<td>-----------------------------</td>
<td>-----------------------------------------------</td>
<td>------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>to requests</td>
<td>to requests</td>
<td>to requests</td>
<td></td>
</tr>
<tr>
<td>• conversation about each person’s day</td>
<td>• conversation about each person’s day</td>
<td>• conversation</td>
<td></td>
</tr>
<tr>
<td>• enjoying each other’s company</td>
<td>• laughing and having fun together</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Baseline

During the baseline phase, all child-related dependent variables were measured across the three families before comprehensive assessment and plan design procedures were initiated. Videotaped observations occurred in the three target meal routines in conformance with the non-concurrent multiple baseline design. During an observation probe, the parents were first asked to read a one-page summary of the operational definition of each envisioned routine. The parents then were asked to implement the envisioned routine with their child. Based on the apriori random assignment of baseline lengths, the first family (Luke) to begin baseline conditions was assigned a baseline length of 7 observations, the second family (Robbie) was assigned a baseline length of 5 observations, and the third family (Josh) was assigned a baseline length of 9 observations. To ensure that the statistical assumptions of the ITSACORR interrupted time-series statistical analysis software program (Crosbie, 1993) were adequately met, a minimum of five observations were conducted during the baseline phase and intervention phase for each family. ITSACORR evaluates the statistical difference between two adjacent phases of time-series data, and requires a minimum of five observations per phase. After the assigned baseline length was completed (i.e., 5, 7, or 9 observations) if a non-stable baseline was evidenced, baseline measurement continued until a stable or increasing trend in child problem behaviour was documented. Finally, the Beach Center Quality of Life Survey (Park et al., 2003) and the Parenting Stress Index (PSI) (Lloyd & Abidin, 1984) were administered to the three mothers to assess the family’s quality of life and relative magnitude of stress in the parent-child system before intervention.
Intervention

During the intervention phase, the interventionist fully implemented the components and steps of the ecological approach to behavioural feeding intervention that were described earlier. This was done in conformance with the non-concurrent multiple baseline design.

Comprehensive assessment. The interventionist completed assessment procedures that were initiated during preliminary assessment with each family. First, a full functional assessment interview (FAI) was completed using a modified version of the form developed by O’Neill and colleagues (1997). The functional assessment interview took place in the family’s home and was completed in approximately 60 minutes. After completion of the interview, the experimenter, in collaboration with the parents, merged information obtained from the FAI and behavioural feeding assessment to develop hypotheses regarding the function of problematic feeding behaviours. The functional assessment interview indicated that all three children engaged in nine categories of problem behaviour: (a) food refusal; (b) negative vocalizations; (c) physical aggression; (d) disruptive/destructive behaviours; (e) tantrums; (f) physical resistance to parent physical assistance; (g) elopement; (h) out of assigned area; and (i) non-compliance.

During meal routines, several ecological conditions appeared to contribute each child’s problematic feeding behaviours. For Robbie, his long days of preschool and behavioural intervention left him with little down time before dinner. For Luke, his low tone and seizure disorder caused him to tire easily, especially later in the day around dinner hour. In addition, the occupational therapist reported that due to his low tone, Luke experienced difficulties with chewing. For Josh, because he was a diabetic, regulating his meals to ensure he was hungry
and therefore more motivated to eat new foods was difficult to achieve for there was risk that his blood sugar level might have dropped to a dangerously low level during a meal.

For all three children, the antecedent event of a request or demand to eat new, non-preferred foods typically provoked problem behaviour. For Luke, the demand to come to the table and sit and eat preferred foods was an additional antecedent event that provoked problem behaviour.

Finally, all three families consistently responded to their child’s problem behaviour by allowing their child to leave the table, removing the food, or offering a different, preferred food. One hypothesis about the function of all three participant’s problematic feeding behaviours emerged from the assessment: each child engaged in mealtime related problem behaviours to avoid the demand to eat non-preferred foods or in Luke’s case, to also avoid the demand to come to the table and eat preferred foods.

The validity of hypotheses about the functions of problem behaviour then was tested during a series of experimental manipulations conducted in family homes with each mother as the interventionist (Lucyshyn et al., 1997). Three conditions were designed to test for the presence of escape-motivated, attention-motivated, or tangible-motivated problem behaviour. A fourth condition that predicts the absence of problem behaviour served as a control. During the escape condition, a plate of three non-preferred foods was placed in front of the child while demands to take a bite of food were delivered every 10-15 seconds. Demands were presented by the mother placing a bite of food towards the child’s mouth and verbally requesting the child to “take a bite.” The plate of non-preferred food was removed for 30 seconds contingent on problem behaviour. During the attention condition, a plate of three non-preferred foods was place in front of the child but no demands were given and attention was diverted away from
the child. Contingent on problem behaviour the mother delivered attention (e.g., “I know you don’t like the food,” “Why don’t you like it?” “Does it taste yucky?”). During the tangible condition, a plate of three non-preferred foods was placed in front of the child. Also on the table but out of reach of the child was a plate of highly preferred foods or for Luke a bottle of milk. No demands were given to eat the non-preferred food and attention was delivered continuously. The parent denied any requests by the child to eat the preferred foods or drink. Contingent on problem behaviour, the mother then gave the child a small bite of preferred food or a small sip of milk. During the control condition, a plate of three non-preferred foods was placed in front of the child. No demands were given and attention was delivered continuously. The conditions were presented in counterbalanced order across three sessions using a variation of the procedure used by Iwata, Dorsey, Slifer, Bauman, and Richman (1982). During hypothesis-testing sessions, parents read a procedural description of each condition and then implemented each condition with their child for 5 min or a dangerous behaviour occurred. After a condition was completed, the child was allowed to rest for a few minutes. During this pause between conditions, the experimenter provided feedback to the mother on implementation fidelity, and the mother prepared to implement the next condition. An observer videotaped the sessions and the data was later coded using an observation software program (e.g., Windows Media Player). All behaviours were measured as the percentage of intervals of problem behaviour. Each interval was ten seconds in length. The experimental analysis served to confirm or disconfirm the hypothesized functions of child problem behaviour in routines. For Luke, an additional session of each condition was implemented to confirm an escape hypothesis.
Last, the family ecology assessment was completed. Families were interviewed about their goals, strengths, resources and social supports, and sources of stress (See Appendix F). Table 2.5 summarizes information gathered from the family ecology interview with each family. Results from the behavioural feeding interview, the functional analysis/assessment, and the family and routine assessment were used to develop a technically sound and contextually appropriate behaviour support plan for each target routine.
Table 2.5

Results From the Family Ecology Interview

<table>
<thead>
<tr>
<th>Family</th>
<th>Routine</th>
<th>Child’s positive contributions</th>
<th>Family strengths</th>
<th>Resources</th>
<th>Stressors</th>
<th>Goals</th>
</tr>
</thead>
</table>
| Robbie | Dinner  | • Robbie is a loving, fun, happy child  
• Keeps his parents young and active  
• Having Robbie has reconnected them with their extended families  
• Taught both parents that there is more to life than their careers | • Loving, mature, realistic  
• Priority for both parents is parenting Robbie  
• Patient, resilient | • Robbie receives 20 hours a week of behavioural intervention  
• Attends preschool 3 days a week  
• Robbie receives SLP and OT services  
• Mother attends parent support group  
• Mother has many friends that support the mother emotionally | • Lack of sleep  
• Not being able to solve Robbie’s feeding issues  
• Mother worries that Robbie is not learning properly due to the lack of nutrients he gets from his limited diet  
• Managing Robbie’s other problem behaviours (i.e., transitions and toileting) | • Expand Robbie’s diet to include vegetables and meats  
• Parents learn some positive strategies  
• Be able to go to restaurants together as a family  
• Be able to go on holidays and not worry about what to feed Robbie. |
| Luke   | Dinner  | • Luke is loving and affectionate  
• Luke has taught his family to appreciate differences and love unconditionally  
• Boys enjoy playing together | • Easy going family  
• Love to have fun together  
• Loving and affectionate  
• Good at celebrating successes and achievements in the family  
• Boys enjoy playing together | • Luke receives 20 hours a week of behavioural intervention  
• Attends preschool 5 days a week  
• Luke receives SLP and OT services  
• Mother attends parent support group  
• Mother has many friends that support the mother emotionally | • Not being able to solve Luke’s feeding issues  
• Luke’s chronic constipation  
• Managing Luke’s problem behaviours outside the meal routine  
• Dad not involved, unemployed | • Parents want to learn to feed Luke  
• Do something together as a family each day (i.e., eat dinner together)  
• Involve older brother as a model in the intervention effort  
• Be able to go on holidays and not worry about what to feed Luke |
| Josh   | Snack   | • Very happy boy  
• Raising Josh has expanded  
• Care about each other  
• Parents want the best for each | • Josh receives 20 hours a week of behavioural intervention | • Mom is often embarrassed by Josh’s diet  
• Mom feels a | • Expand Josh’s diet to include fruits, vegetables, |
**Family** | **Routine** | **Child’s positive contributions** | **Family strengths** | **Resources** | **Stressors** | **Goals**
---|---|---|---|---|---|---
parents’ interests  
• Love teaching Josh new things  
• Josh plays well with his baby brother  
family member  
• Enjoy spending time together  
• Parents able to find time for themselves e.g., skating lessons  
• Dad often gives mom a break and takes the boys out  
• Value exercise and eating healthy  
intervention  
• Attends preschool 3 days a week  
• Josh receives SLP and OT services  
• Grandma babysits the boys  
• Parents have many friends  
• Parents attend couples counseling  
lot of pressure from extended family to solve Josh’s eating issues  
• Managing Josh’s blood sugar levels  
• Infrequent bowel movements  
• Parents can be inconsistent with what to feed Josh and the strategies used.  
meat/meat alternatives  
• Parents to become consistent with how they feed Josh

**Behavioural support plan development.** In collaboration with each family, the interventionist developed an individualized behaviour support plan for the target meal routine. Support plans for each routine were developed in step-wise (i.e., lagged) fashion in conformance with the multiple baseline design. The development of the behavioural support plan had four steps. First, functional assessment results were used to develop a summary statement/competing behaviour pathway diagram for individual routines. Second, for each feature of the problem in the pathways diagram for a routine (e.g., setting events, antecedent triggers, problem behaviour, maintaining consequences), a logically-linked behaviour support strategy was generated. Third, the parents and interventionist reviewed family ecology information and adjusted the strategies to better fit the routine and family. Fourth, the interventionist distilled the support strategies into a two-page implementation checklist that was used during the parent-training phase. The finalized behaviour support plan for each child, including contextual fit considerations, is summarized in Table 2.6. See Appendix G for the full version and implementation checklist for each family.
### Table 2.6

Summary of Behaviour Support Plans Including Contextual Fit Considerations

<table>
<thead>
<tr>
<th>Family</th>
<th>Routine</th>
<th>Setting event strategies</th>
<th>Antecedent Strategies</th>
<th>Teaching Strategies</th>
<th>Consequence Strategies</th>
<th>Contextual Fit Considerations</th>
</tr>
</thead>
</table>
| **Robbie** | Dinner | • Limit food and milk 2-3 hours prior to dinner  
• Begin initial feeding sessions earlier in the day  
• Use visual supports to increase predictability  
• General case programming | • Demand fading  
• Stimulus fading of amount of food  
• Offer choices  
• Positive contingency statements  
• With new foods, give Robbie the new food simultaneous with the reinforcer (treat) | • Teach Robbie to ask for a break | • Offer praise and treat contingent on eating bites of foods or a portion of food  
• Ignore and redirect minor problem behaviours  
• Use escape extinction procedure for major behaviours | • Teach dad to use support strategies with son  
• Teach Robbie to eat foods commonly served at restaurants |
| **Luke** | Dinner | • Limit food and milk 2-3 hours prior to dinner  
• Begin initial feeding sessions earlier in the day | • Demand fading  
• Stimulus fading of amount of food  
• Offer choices  
• Positive contingency statements | • Teach Luke to ask for a break | • Offer praise and preferred activity contingent on eating bites of foods or a portion of food | • Use self-management system with older brother  
• Schedule one meal a week with father |
<table>
<thead>
<tr>
<th><strong>Family Routine</strong></th>
<th><strong>Setting event strategies</strong></th>
<th><strong>Antecedent Strategies</strong></th>
<th><strong>Teaching Strategies</strong></th>
<th><strong>Consequence Strategies</strong></th>
<th><strong>Contextual Fit Considerations</strong></th>
</tr>
</thead>
</table>
| Josh Snack        | • Test Josh’s blood sugar level before snack. If low, offer easy foods to start  
• Use visual supports to increase predictability  
• General case programming | • Demand fading  
• Stimulus fading of amount of food  
• Offer choices  
• Positive contingency statements  
• With new foods, give Josh the new food simultaneous with the reinforcer (treat) | • Teach Josh to ask for a break | • Offer praise and treat contingent on eating bites of foods or a portion of food  
• Ignore and redirect minor problem behaviours  
• Use escape extinction procedure for major behaviours  
• De-escalation procedure | • Enlist support of early intervention team to help parents with Luke’s problem behaviour at other times of day  
• Expand the number of protein enriched foods in Josh’s diet  
• Teach dad to support Josh during snack  
• Offer younger brother preferred toys to play with while mom is busy, rotate toys often |

- Serve small portions and cut food up into small pieces  
- Use visual supports to increase predictability  
- Increase positive events at the dinner table  
- General case programming  
- Ignore and redirect minor problem behaviours  
- Use escape extinction procedure for major behaviours  
- De-escalation procedure
Implementation plan development. Immediately following the design of the behaviour support plan for the family’s targeted routine, an implementation plan was designed in collaboration with the families. The implementation plan defined: (a) training materials and support activities that were used to empower family members to implement behaviour support strategies; (b) roles and responsibilities; and (c) a timeline for completing the support process. The implementation plan was attached as an addendum to each family’s behaviour support plan (See Appendix G).

Implementation support

Three phases of implementation were sequentially introduced: (a) intensive training with interventionist; (b) initial parent training; and (c) maintenance support.

Intensive training with interventionist. The interventionist began intensive training with the child for the purpose of establishing initial stimulus control and to set the stage for a transfer of stimulus control to the parent in the natural setting of the meal routine. At the start of the intensive training phase, materials necessary for the implementation of particular support procedures (e.g., visual supports) were developed and included in each training session. For Robbie, training sessions occurred 4 times per week (M=43 minutes), and required 8 sessions across two weeks for a total of 6 hours. For Luke, training sessions occurred 3 times per week (M=50 minutes), and required 6 sessions across two weeks for a total 5 hours. For Josh, training sessions occurred 4 times per week (M=55 minutes), and required 10 sessions across two and half weeks for a total of 9.5 hours. See Table 2.7 for a vignette of an intensive training session with the interventionist.
Table 2.7

Vignette of an Intensive Training Session with Interventionist

• Prior to the start of intensive training sessions, Robbie’s mother and the interventionist have identified three foods for Robbie to try during his feeding session with the interventionist.
• The feeding session takes place in the defined mealtime area (dining room), however, mom and/or dad are not present and common distracters are turned off (e.g., television, video games).
• The interventionist asks Robbie in which order he would like to try the three foods (e.g., “What food do you want to try first?”). If Robbie responds, “fish sticks,” then the interventionist writes the word fish sticks at the top of his visual contingency. The interventionist then asks Robbie which food he would like to try second, and so on until all the foods are listed on the visual contingency in the order in which Robbie would like to eat them.
• The interventionist then informs Robbie of how many bites he is expected to eat of each food. For example, if it is a new food, Robbie is expected to eat a few, very small bite sized pieces of the food. To ensure that Robbie understands how many bites he is expected to eat, boxes are drawn on his visual contingency, each box representing a bite of food. A total of 20 bites of food are presented during the session across the three-targeted foods.
• The interventionist then informs Robbie of when he will earn a treat, by writing a T above some of the boxes on his visual contingency. For new foods, a T is written above each and every box for that new food. For more familiar foods, a T is written above every second or third box for that particular food.
• Before a presentation of the food, the interventionist shows Robbie the plate of food and asks him to choose his next bite. For example, “Which size bite do you want to try next? The little one or the big one?” If Robbie does not make a choice of size of bite, the interventionist chooses for him.
• The interventionist then asks Robbie what he would like as a treat after eating a bite of food. Treats are located in small dishes on the dining room table. The dishes are in view but out of Robbie’s reach. Robbie’s choice of treat is then presented to Robbie either simultaneous with a bite of new food or contingent on him accepting and swallowing a bite of a more familiar food.
• The interventionist then praises Robbie for successful acceptance of the new food (e.g., “Wow! You did it! You tried broccoli!”).
• Once Robbie has swallowed the food, the interventionist prompts him to cross off a box on his visual contingency and count how many boxes are left for the target food.
• If Robbie engages in problem behaviour, the interventionist holds the bite of food up close to Robbie’s mouth and repeats the demand to take a bite every 10-15 seconds until Robbie complies and accepts the food. The interventionist ignores any protests or negative vocalizations. If Robbie runs away from the table, the interventionist
swiftly brings him back and prompts him to sit in his chair. The bite of food is then presented again until Robbie accepts.

- The feeding session ends after Robbie has accepted and consumed the 20 bites of food. The approximate length of the feeding session is 25 minutes. If after 120 minutes Robbie has not accepted and consumed the 20 bites of food, the session is terminated and the interventionist tries again the next day.

**Parent training.** Once the child was consistently consuming, with minimal problem behaviour, full-sized spoonfuls/bites of a minimum of five foods, the parent training phase began. For Robbie’s mother, training and support activities occurred 3-4 times per week and lasted 30-45 minutes (M=40 minutes). Parent training involved 16 training sessions across 8 weeks for a total of 11 hours. For Luke’s mother, training and support activities occurred 2-4 times per week and lasted 60 minutes (M=54.3 minutes). Parent training involved 28 sessions across 15 weeks for a total of 25 hours. For Josh’s mother, training and support activities occurred 3-4 times a week and lasted 60 minutes (M=55 minutes). Parent training involved 20 sessions across 6 weeks for a total of 18 hours.

During parent training and support sessions, the interventionist implemented a flexible but common set of activities. These activities included modeling of interventions for the mother, coaching the mother in the use of interventions, problem solving discussions, role play, and self-monitoring and self-evaluation using the implementation checklist. During early training sessions, the interventionist directly implemented the support procedures with the child during the natural meal routine, while the mother observed and praised her child for accepting and consuming new foods. The mother then implemented the support procedures with her child while the interventionist observed and coached (i.e., delivered suggestions, modeled, gave feedback) the mother in accurate use of the procedures. Initially, the mother supported her child to eat new foods previously mastered with the interventionist. As the child became successful with having
his mother support him during the meal routine, the interventionist coached the mother to teach her son to accept and consume new, non-preferred foods. After a training session was complete, using the implementation checklist as their guide, the interventionist and parent discussed the child’s progress (e.g., foods consumed, level of problem behaviour), highlighted support procedures that the parent implemented effectively, and reviewed common implementation errors. As the mother and child became successful at participating in the meal routine together, the interventionist began to fade training and support activities. During the last few training sessions of the parent training phase, the interventionist briefly coached the mother just before the training session began, describing or modeling the strategy that was still weak in the mother’s repertoire. The interventionist then only provided support when it appeared that the mother was not able to overcome an escalation in the child’s problem behaviour or self-correct a series of implementation errors.

Maintenance support. After stable and meaningful improvement in child behaviour and routine participation were observed, the routine entered a maintenance support phase. The focus during the maintenance support phase was to empower the parent to become self-sufficient in their use of the support strategies and prevent a relapse toward the coercive process.

The interventionist provided support to the family approximately once every week to two weeks for approximately one hour. For Robbie’s mother, maintenance support involved 7 sessions across 10 weeks for a total of 7 hours. For Luke’s mother, maintenance support involved 9 sessions across 14 weeks for a total of 12 hours. For Josh’s mother, maintenance support involved 7 sessions across 9 weeks for a total of 8 hours. During maintenance support sessions the following tools were used: (a) revised implementation checklist; (b) coercive process assessment; and (c) relapse prevention plan (see Appendix H). The revised
implementation checklist was an abbreviated version of the original checklist containing only the core strategies that were necessary to maintain improvements in child eating behaviour and routine participation. The coercive process assessment was a brief self-monitoring tool to assess whether a coercive process had returned. The relapse prevention plan identified obstacles to maintenance that could lead to a regression and solutions that would help the parent continue to support their child effectively and build resilience to future setbacks. To facilitate maintenance in the absence of the interventionist, the parents were encouraged to once a week use the revised implementation checklist to self-monitor and self-evaluate their use of the support strategies for maintaining improvements and preventing a relapse. In addition, parents were encouraged to complete the coercive process assessment tool to self-monitor and self-evaluate the potential re-occurrence of a coercive process in the targeted meal routine. During maintenance support sessions the interventionist reviewed the completed checklist and self-monitoring tool with the parents. If there had been a relapse in progress, the interventionist and parents reviewed the relapse prevention plan and determined whether the necessary strategies were in place to overcome the setback.

Follow Up

For each family, the follow-up phase began after the mothers demonstrated the ability to: (a) feed their child one new food without the interventionist present; and (b) use the relapse prevention self-management tool to recognize and overcome regressions in the targeted routine (e.g., illness, vacation). Follow-up observation sessions in target routines took place at 1, 2, and 3 months post-intervention. The observation protocol used during baseline and intervention phases were maintained. Following a follow-up observation session, behavioural support was provided as needed.
Data Analysis and Interpretation

Visual and Statistical Analysis of Single Subject Design Data

Percent of problem behaviour, total number of bites consumed, and steps completed was analyzed using visual and statistical analysis procedures (Houle, 2009; Parsonson & Baer, 1986). For each family, percentage of intervals of problem behaviour, bites consumed per minute, and percentage of steps completed were graphed and visually analyzed. Criteria for a multiple baseline design were used to evaluate whether a functional relationship existed between the intervention and changes in child behaviour and routine participation. Specifically, the experimenter visually examined the number of data points, variability of the data, level of behaviour, direction and degree of slope, and the immediacy of change in level when a phase change occurred. To test the statistical significance of changes, the ITSACORR interrupted time-series analysis software program (Crosbie, 1993) was used. ITSACORR uses an omnibus $F$ test to determine the statistical significance of the overall change in intercept and slope between baseline and intervention phases having 5 or more data points. The program controls for autocorrelation. The visual analysis of results was interpreted in terms of the functional effect of intervention on child behaviour and participation in routines. The statistical analysis of the results was interpreted in terms of the statistical significance of changes in child behaviour and routine participation from baseline to intervention conditions.

Conditional Probability Analysis of Coercive and Constructive Processes

The analysis of conditional probabilities of coercive and constructive processes in family meal routines occurred across families within research phases (e.g., baseline, intervention). The following procedures were used to generate aggregate conditional probability data. First, observation sessions for families were coded using the PACCS coding system and Observer.
After data for one observation session were entered, an Observer data file was saved for that session. After all observation sessions for a particular phase (e.g., baseline or intervention) were entered and saved, the OTS software program (Bakeman & Quera, 2000) was used to convert Observer data files (i.e., odf files) into a format compatible with the Sequential Data Interchange Standard and General Sequential Querier (SDIS/GSEQ) software program (Bakeman & Quera, 1995) (i.e., “sds” files). These “sds” files were then converted into “Cycles” files using the Cycles software program (Bakeman, 2001). The software program Cycles controls for irrelevant or trivial codes that are interspersed within patterns of coercive interaction (e.g., after a parent demand, the parent engages in one or two other behaviours before the child complies). The Cycles program converts each file of parent and child interaction data into a series of parent-child behaviour cycles. A cycle is comprised of one or more parent codes followed by one or more child codes. Thus, each cycle is represented by one line, or cycle, of parent-child interaction. Following the creation of Cycles files, SDIS/GSEQ was used to merge observation files across families by research phase (baseline and intervention). The General Sequential Querier (GSEQ) for Windows was then used to conduct sequential analyses of hypotheses about coercive and constructive processes across families within a particular research phase. Specifically, questions were posed that statistically tested for the presence of the first two, the first three, and the full four steps in the sequential pattern for an (a) escape driven coercive process, and (b) escape driven constructive process (see dependent variables).

GSEQ for Windows (Quera & Bakeman, 2000) was used to answer the statistical questions. To do so, a series of $2 \times 2$ a contingency tables were created for aggregated baseline data and for aggregated intervention data. The two rows represented, respectively, criterion (i.e.,
given) behaviour and residuals (i.e., all other codes). The two columns represented, respectively, target behaviours and residuals. GSEQ was then programmed to compute: (a) the lag frequency of target codes and residuals within each box of the contingency table; (b) the conditional probability of the target behaviour given the criterion behaviour; (c) the adjusted residuals, which approximate a normal distribution and thus are equivalent to binomial z-scores; and (d) the probability value ($p$) that allows for the interpretation of the adjusted residual in terms of statistical significance.
CHAPTER 3

RESULTS

Overview

Results of the functional analysis and of the implementation of the ecological behavioural feeding approach for each participant are presented in this chapter. The first goal of this study was to determine whether a functional relationship exists between implementation of the ecological approach and: (a) decreases in the percentage of intervals of child problem behaviour; (b) increases in the number of bites per minute during a meal routine; and (c) increases in the percentage of steps successfully completed in meal routines. In addition, changes from baseline to intervention in percent of problem behaviour, bites consumed per minute, and percent of steps completed were analyzed using the ITSACORR statistical software program (Crosbie, 1993) to determine if changes from baseline to intervention were statistically significant. A related goal was to determine if implementation of the approach was associated with maintained improvements in percent of problem behaviour, bites consumed per minute, and percent of steps completed, up to three months post-intervention.

A second goal of the study was to examine the extent to which coercive processes of parent-child interactions during baseline were transformed into constructive processes of interaction during intervention. Two sets of results were generated to achieve this goal. The first step was to determine if the conditional probability of the first two, the first three, and the full four-step coercive process was statistically significant during baseline and not significant during intervention. The second step was to determine if the conditional probability of the first two, the first three, and the full four-step constructive process was statistically significant during intervention and not significant during baseline.
A fourth goal of the study was to examine whether implementation of the ecological approach was associated with parents’ accurate use of behaviour support strategies.

A fifth goal was to assess whether the behaviour support plans developed for each family and child were socially valid and from the parent’s perspective, possessed a “goodness of fit” with the family’s ecology.

A final goal was to determine whether implementation of the ecological approach was associated with improvements in family functioning, specifically, parent stress and family quality of life.

*Functional Analysis*

Figure 3.1 presents the session-by-session functional analysis data, by condition, for problem behaviours for each child. For Luke, visual inspection of the data reveal that the highest average percentage of intervals of problem behaviour was during the Demand condition (M = 69%). These data support a primary function of escape from demands to eat non-preferred foods. The Tangible condition (M = 51%) has the next highest average percentage of intervals of problem behaviour, suggesting a secondary function of accessing tangibles in the form of a bottle of milk. For Robbie, the average percentage of intervals of problem behaviour was highest in the Demand condition (M = 61%), supporting a primary function of escape from demands to eat non-preferred foods. Similar to Luke, the Tangible condition was the next highest percentage of problem behaviour (M = 22%), suggesting a possible secondary function of engaging in problem behaviour to get preferred food. Josh’s data suggest that his problem behaviour also was maintained by escaping the demand to eat non-preferred foods. The average percentage of intervals of problem behaviour during the Demand condition was 62%. The condition with the second highest percentage of intervals of problem behaviours was the Tangible condition with an
average of 25%. Similar to Luke and Robbie, these data suggest a possible secondary function of engaging in problem behaviour to get preferred food. Results from the attention and control conditions confirm that during non-demanding interactions with either no attention or non-contingent attention, all three participants engaged in low levels of problem behaviour (means less than 10% of intervals).
Figure 3.1. Functional analyses of child problem behaviour
Implementation of Ecological Behavioural Feeding Approach

Eight dependent variables were used to evaluate the impact of implementation of the ecological approach: (a) percentage of intervals of problem behaviour; (b) bites consumed per minute; (c) percentage of steps successfully completed in routine; (d) conditional probability of coercive processes and of constructive processes; (e) percentage of intervals of parent’s accurate use of behaviour support plan strategies; (f) average rating of the social validity of the support effort; (g) average index of the support plan’s “goodness-of-fit” with the family’s ecology; and (h) family functioning scores (i.e., family quality of life and parenting stress). Results for these variables are summarized below.

Problem Behaviour

Figure 3.2 shows the percentage of intervals of problem behaviour for Robbie, Luke, and Josh. These data represent multiple probe measurement within a nonconcurrent multiple baseline design in which probes were gathered every 2-3 days during baseline and every 3-4 training sessions during intervention. Overall, when comparing baseline to intervention phases, the data reveal high and stable levels of problem behaviour during baseline and marked improvements in problem behaviour at the point of intervention across the three participants. During baseline, problem behaviour averaged 74% of intervals (range, 55 - 92%) across the three participants. This decreased to an average of 16% (range, 2 - 51%) during the initial training phase of intervention and 9% (range, 2 - 42%) during the maintenance phase of intervention. During follow up, problem behaviour further decreased to an average of 5% (range, 0 - 18%). Across the three participants, the percentage of non-overlapping data was zero. A summary of problem behaviour data for each participant is presented below.
Robbie. During baseline, problem behaviour data were high and stable at an average of 74% of intervals (range, 68 - 78%). The onset of intervention evidenced a marked improvement in problem behaviour. The percentage of intervals of problem behaviour decreased to an average of 12% (range, 6 - 27%) during the initial training phase. During the maintenance phase, further improvements were evidenced as problem behaviour data decreased to an averaged of 4% of intervals (range, 3 - 5%). During follow up, problem behaviour increased slightly to an average of 8% of intervals (range, 1 – 13%).

Luke. During baseline, problem behaviour averaged 81% of intervals (range, 55 - 92%). During the initial training phase of intervention problem behaviour evidenced a steady, gradual improvement, with an average of 27% of intervals (range, 4 - 51%). The onset of the maintenance phase of intervention evidenced a further but variable improvement in problem behaviour. The percentage of intervals of problem behaviour decreased to an average of 13% (range, 3 – 42%). During follow-up, Luke’s problem behaviour further improved to an average of 9% of intervals (range, 1 - 18%).

Josh. Baseline data evidence a high and stable pattern of problem behaviour; the average percentage of intervals was 68% (range, 55 - 75%). This level of problem behaviour dropped precipitously during the initial training phase of intervention to an average of 7% of intervals (range, 2 – 16%). Problem behaviour data further improved during the maintenance phase of intervention to an average of 5% of intervals (range, 2 – 9%). During follow up, problem behaviour stabilized at near zero levels (range, 0 – 2%).

A statistical analysis of intervention effects was conducted for each child’s baseline using the ITSACORR interrupted time-series analysis software program (Crosbie, 1993). For problem behaviours, the omnibus F test showed statistically significant overall change from baseline to
intervention for Luke, $F(2, 17) = 3.77, p = .04$ and for Josh, $F(2, 14) = 7.79, p = .01$. Overall change in problem behaviour for Robbie was not statistically significant, $F(2, 10) = 2.76, p = .11$.

**Figure 3.2.** Percentage of intervals of problem behaviour during the routine. Note: The month in which one or more probe sessions occurred is indicated under the first data point for that month. ITI = Intensive Training with Interventionist phase.

**Bites Consumed**

Figure 3.3 shows the number of bites consumed per minute for Robbie, Luke, and Josh. These data represent a multiple probe measure within a nonconcurrent multiple baseline design in which probes were gathered every 2-3 days during baseline and every 3-4 training sessions during
intervention. Overall, the data show near zero levels of bites consumed during baseline and marked improvements in number of bites consumed at the point of intervention across the three participants. During baseline, the number of bites consumed per minute averaged 0.05 (range, 0 - 0.3) across the three participants. This increased to an average of 1.5 (range, 0.7 – 2.5) bites per minute during the initial training phase of intervention and 1.7 (range, 0.60 – 3.0) bites per minute during the maintenance phase of intervention. The number of bites consumed per minute further increased to an average of 1.9 (range, 0.8 – 3.1) during follow-up. Across the three participants, the percentage of non-overlapping data was zero. A summary of number of bites consumed per minute data for each participant is presented below.

Robbie. During baseline, the number of bites consumed was stable and low with an average of 0.07 bites per minute (range = 0 to 0.3). The introduction of intervention evidenced a steady, gradual improvement in Robbie’s eating behaviour. An average of 1.6 bites per minute (range = 0.7 to 2.3) was evidenced during initial training. During maintenance, Robbie’s eating further improved to an average of 2.6 bites per minute (range = 2.3 to 3). During follow up, bites per minute data decreased slightly to an average of 2.2 bites per minute.

Luke. During baseline, bites per minute data were stable and low with an average of 0.07 (range = 0 to 0.5). The introduction of intervention evidenced a steady, gradual improvement in Luke’s eating behaviour. An average of 1.6 bites per minute (range, 0.9 to 2.5) was evidenced during initial training. During the maintenance phase of intervention, bites per minute data decreased somewhat to an average of 1.2 bites per minute (range, 0.6 – 1.6). After a temporary deterioration in eating behaviour during the first session of the maintenance phase (Session 14 = 0.6 bites per minute), the data gradually returned to levels previously obtained during initial training with an average of 1.3 bites per minute (range, 1.0 – 1.6) for the remaining five sessions.
During follow up, Luke’s eating behaviour maintained at an average of 1.3 bites per minute (range, 1 - 1.6).

Josh. Baseline data revealed a low and stable rate of bites consumed with an average of 0.02 bites per minute (range = 0 to 0.07). This level of eating behaviour improved to an average of 1.3 bites per minute (range = 0.9 - 1.9) during initial training. Further improvement was evidenced during maintenance phase as the average increased to 1.7 bites per minute (range = 1.3 - 2.4). During follow up, bites per minute data further improved to an average of 2.2 bites per minute (range, 0.8 – 3.1). After a temporary deterioration in eating behaviour during the first session of follow up (0.8 bites per minute), the data for the remaining two sessions exceeded levels obtained during intervention, with an average of 2.9 bites per minute.

A statistical analysis of intervention effects was conducted for each child’s baseline using the ITSACORR interrupted time-series analysis software program (Crosbie, 1993). For number of bites consumed per minute, the omnibus $F$ test showed a statistically significant overall change from baseline to intervention for Josh, $F (2, 14) = 7.01, p = .01$. Overall change in bites consumed per minute was not statistically significant for Luke, $F (2, 17) = 2.64, p = .10$ and for Robbie, $F (2, 10) = 1.36, p = .29$. 
Figure 3.3. Number of bites consumed per minute. Note: The month in which one or more probe sessions occurred is indicated under the first data point for that month. ITI = Intensive Training with Interventionist phase.

Steps Successfully Completed

Figure 3.4 shows the percentage of intervals of steps successfully completed for Robbie, Luke, and Josh. These data represent a multiple probe measure within a nonconcurrent multiple baseline design in which probes were gathered every 2-3 days during baseline and every 3-4 training sessions during intervention. Overall, the data show low and stable levels of percentage of steps completed during baseline and a level increase and gradual improvement at the point of intervention across the three participants. During baseline, the percentage of steps completed
averaged 20% (range, 0 – 50%) across the three participants. This increased to an average of 78% (range, 50 – 100%) of steps completed during the initial training phase of intervention and 95% (range, 75 – 100%) during the maintenance phase of intervention. During follow up the percentage of steps completed maintained at an average of 95% (range, 86 - 100%). Across the three participants, the percentage of non-overlapping data was zero. A summary of steps completed data for each participant is presented below.

Robbie. During baseline the percentage of steps completed was stable at an average of 44% (range, 30 – 50%). During the initial training phase of intervention, steps completed data evidenced a gradual improvement with an average of 80% (range, 50 - 100%). During the maintenance phase of intervention, the percentage of steps successfully completed further improved and stabilized at an average of 100%. During follow up, the percentage of steps successfully completed decreased slightly to an average of 97%.

Luke. During baseline, steps completed data averaged 4% (range, 0 - 13%). During the initial training phase of intervention, the percentage of steps completed gradually improved with an average of 69% (range, 50 - 100%). During the maintenance phase, steps completed data further improved, with some variability, to an average of 90% steps completed (range, 75 -100%). Further improvements were evidenced during follow-up, with an average of 94% steps completed (range, 88 – 100%).

Josh. During baseline, Josh completed an average of 20% of steps (range, 13 – 25%). Following the introduction of intervention there was marked improvements in Josh’s behaviour. Steps completed averaged 82% (range, 71 - 100%) during the initial training phase. This data further improved during the maintenance phase to a stable and high average of 100% of steps completed. During follow up, steps completed decreased somewhat to an average of 95% (range,
86 – 100%). After a temporary deterioration in Josh’s behaviour during the first session of follow up (86% of steps completed), the data returned to levels previously obtained during the maintenance phase of intervention with an average of 100% of steps completed for the remaining two sessions.

A statistical analysis of intervention effects was conducted for each child’s baseline using the ITSACORR interrupted time-series analysis software program (Crosbie, 1993). For percentage of steps completed, the omnibus $F$ test showed statistically significant overall change from baseline to intervention for Luke, $F (2, 17) = 5.06, p = .01$ and for Josh, $F (2, 14) = 7.70, p = .01$. Overall change in percentage of steps completed for Robbie was not statistically significant, $F (2, 10) = 1.36, p = .30$. 
Figure 3.4. Percentage of steps successfully completed during the routine. Note: The month in which one or more probe sessions occurred is indicated under the first data point for that month. ITI = Intensive Training with Interventionist phase.

Conditional Probability of Coercive Processes and of Constructive Processes

Coercive Processes. The aggregated sequential analysis results of coercive processes during meal routines are presented in Figure 3.5. Results show relative frequencies (JNTF), conditional probabilities (CONP), adjusted residuals (i.e., binomial z-score equivalents) (ADJR), and levels of statistical significance (PVAL) for the first two-steps, the first three-steps, and the
full four-steps of an escape-driven coercive process in home meal routines during baseline and intervention. During baseline, across the three families, results show high relative frequencies for the first two-steps (JNTF = 180), the first three-steps (JNTF = 80), and the full four-steps (JNTF = 52) of a coercive parent-child interaction. A very strong and stable relationship was evident for the first two-steps in the coercive interaction. Given a parent demand (PRD), the conditional probability that the child engaged in problem behaviour (CPN, CPB) within the same cycle (lag 0) was .72. The adjusted residual was 19.20 (p < .001), showing that this relationship was statistically significant. For the first three-steps of a coercive interaction, given that the first two steps in the sequence occurred within a cycle, the probability that the parent withdrew the demand by engaging in routine related behaviours (POC) in the next cycle (lag 1) was .44. The adjusted residual (2.82) indicated that this interaction was statistically significant at $p < .01$. Regarding the full four-step coercive interaction, given the first two steps in the process, the probability that the parent withdrew the demand followed by the child terminating problem behaviour (COC, COA) was .24. The adjusted residual at 3.26 (p < .001) indicated that this interaction was statistically significant. Taken together, these data indicate that during baseline a strong (i.e., high lagged frequencies) and stable (i.e., high levels of statistical significance) escape driven coercive parent-child interaction was present in meal routines across the three families.

During intervention, results showed a dramatic decrease in the relative frequencies of the first two-steps (JNTF = 12), the first three-steps (JNTF = 1), and the full four-steps (JNTF = 0) of a coercive parent-child interaction. During the first two steps in the interaction, given a parent demand (PRD), the conditional probability that the child engaged in problem behaviour (CPN, CPB) within the same cycle (lag 0) was .06. The adjusted residuals at 6.18 showed that this relationship was highly statistically significant at $p < .001$. During the first three steps of parent-
child interaction, given that the first two steps in the coercive sequence occurred within a cycle, the probability that the parent withdrew their demand by engaging in routine related behaviours (POC) in the next cycle (lag 1) was .08. The adjusted residuals at -1.74 indicated that this interaction was not statistically significant \( (p = .08) \). Finally, regarding the full four-step coercive parent-child interaction, given the first two steps in the coercive sequence, the probability that the parent withdrew their demand followed by the child terminating problem behaviour (COC, COA) was zero. The adjusted residuals at -1.48 showed that this interaction also was not statistically significant \( (p = .14) \). Taken together, these data show that during intervention, a stable, two-step coercive parent-child interaction continued to occur. Following a parent request/demand, the children continued to engage in problem behaviours, albeit at a lower magnitude. However, the stability of the coercive process ceased to be present at the third and fourth step in parent child interaction during meal routines.
Figure 3.5. Sequential analyses of steps in the coercive sequence at lag 1 during baseline and intervention. Note. JNTF = Observed Joint Frequency; CONP = Conditional Probability; ADJR = Adjusted Residual; PVAL = Probability Value.
Constructive Processes. The aggregated sequential analysis results of constructive processes during meal routines are presented in Figure 3.6. Results show relative frequencies (JNTF), conditional probabilities (CONP), adjusted residuals (i.e., binomial z-score equivalents) (ADJR), and levels of statistical significance (PVAL) for the first two-steps, the first three-steps, and the full four-steps of a constructive process in home meal routines during baseline and intervention.

During baseline across the three families, results show low relative frequencies for the first two-steps (JNTF = 35), the first three-steps (JNTF = 8), and the full four-steps (JNTF = 2) of a constructive parent-child interaction. A stable association was evident for the first two-steps in the constructive interaction during baseline. Given a parent demand (PRD, PAS) the conditional probability that the child complied (CCO) within the same cycle (lag 0) was .14. The adjusted residuals at 2.79 showed that this relationship was statistically significant (p < .01). For the first three steps of the constructive interaction, given that the first two steps in the constructive sequence occurred within a cycle, the probability that the parent delivered positive attention (PPA) in the next cycle (lag 1) was .23. The adjusted residuals (0.96) indicated that this interaction was not statistically significant with a p value of .33. Regarding the full four-step constructive interaction, given the first two steps in the process, the probability that the parent provided positive attention followed by the child engaging in acceptable behaviours (COC, COT) was .06. The adjusted residual at -.12 indicated that this interaction was not statistically significant (p = -.91). Altogether, these data indicate that during baseline conditions, although a stable constructive parent-child interaction was observed during the first two steps of the interaction, it ceased to occur at the third and fourth steps in parent-child interaction during meal routines.

During intervention, results show a dramatic increase in the relative frequencies of the first two-steps (JNTF = 142), the first three-steps (JNTF = 66), and the full four-steps (JNTF = 57) in a
constructive parent-child interaction. Similar to baseline, a stable association was evident for the first two steps of a constructive interaction—that is, given a parent demand (PRD) the conditional probability that the child complied (CCO) within the same cycle (lag 0) was .76. However, a four-fold increase in relative frequency (35 to 142) and an adjusted residual of 20.00 ($p < .001$) indicates that the strength of this association was far greater following intervention. For the first three steps of a constructive interaction, given that the first two steps in the constructive sequence occurred within a cycle, the probability that the parent provided positive attention (PPA) in the next cycle (lag 1) was .46. The adjusted residual indicated that this interaction was statistically significant (ADJR = 4.38, $p < .001$). Regarding the full four steps of a constructive parent-child interaction, given the first two steps in a constructive process, the conditional probability that the parent provided positive attention followed by the child engaging in positive attention to the parent (CPA) or acceptable behaviours (COC, COT) was .40. The adjusted residual at 5.48 showed that this interaction was statistically significant ($p < .001$). Taken together, these data indicate that during intervention a strong and stable constructive parent-child interaction emerged in the meal routines.
Figure 3.6. Sequential analyses of steps in the constructive sequence at lag 1 during baseline and intervention. Note. JNTF = Observed Joint Frequency; CONP = Conditional Probability; ADJR = Adjusted Residual; PVAL = Probability Value.
**Parent’s Use of Support Plan Procedures**

Parent treatment integrity data were gathered for 20% of sessions across all participants during the intervention and follow-up phases. These data show an overall average level of treatment integrity of 75% of intervals (range, 42 - 94%). During intervention, treatment integrity was high with an average level of 83% of intervals (range, 67 - 94%). During follow-up, the average level of treatment integrity decreased to 59% of intervals (range, 42 - 89%).

**Social Validity Ratings**

Figure 3.7 shows the results of parent ratings of the social validity of the intervention approach. The self-report questionnaire was administered to each parent twice during intervention (initial training phase and maintenance phase), and once during follow-up. Overall, the results show that the mothers consistently perceived the intervention goals, procedures, and outcomes to be acceptable.

For Luke’s mother, the average social validity index (1 = disagree; 5 = agree) across three evaluations was 4.4 (range, 4.2 – 4.7). Across the evaluations, Luke’s mother consistently rated the goals and outcomes as beneficial to her son and family. She made these comments: “My child DID NOT eat. This is so huge—it’s probably the biggest break through in all of his intervention [referring to Luke’s community based early intervention program]. We are thrilled. It has been a huge step forward for our child and our family.” A lower index rating during the maintenance phase evaluation was due to some unanticipated attention-seeking problem behaviours by the older sibling during dinner. The mother made this comment: “There has been some attention seeking behaviour by our other son but we are trying different strategies.” For Robbie’s mother, the average social validity rating across the three evaluations was 4.9 (no range). The mother made this comment during follow-up: “The interventionist
working first with Robbie was key to the success we have experienced with getting Robbie to eat new foods.” For Josh’s mother, the average social validity rating was 4.7 (range, 4.5 – 4.9). Her high social validity ratings are reflected in the following comments made during maintenance: “No child should exist on chips and cookies, and now I can hardly believe that this was our lifestyle for most of Josh’s life. Food or mealtimes are an extremely important part of our culture and personal happiness. Our whole family life has improved so much since Josh has started eating a more diverse diet.”

Figure 3.7. Parent social validity ratings across three evaluations.

**Goodness-of-Fit Ratings**

Figure 3.8 presents the results from each mother’s evaluation of the how well the behaviour support plan fit with the family’s ecology. The self-report questionnaire was administered to each parent twice during the initial training phase of intervention, once during the maintenance phase of intervention, and once during follow-up. Overall, the results show that the mothers abidingly believed the support plans fit well with their family’s ecology.
For Luke’s mother, the average contextual fit index (1 = poor fit; 5 = good fit) across four evaluations was 4.6 (range, 4.3 – 4.8). An improvement in contextual fit indices across evaluations is reflected in the following comments. During initial training, the mother made this comment: “It’s overwhelming to realize the time and energy needed to put the (support) plan into action.” During maintenance, she responded to the same question but made this comment instead: “The (support) plan seems to get easier with each month that goes on, it becomes more natural.” For Robbie’s mother, the average contextual fit index across four evaluations was 4.7 (range, 4.4 – 4.9). The mother made the following comments during follow-up: “I am worried that with reduced contact from the interventionist I might start forgetting or get lazy with supporting my son.” For Josh’s mother, the average contextual fit index across four evaluations was 4.9 (range, 4.8 – 4.9). The mother made the following comments during follow up: “The interventionist has taught my husband and I so much about Josh and how to help him overcome his strong aversion to certain foods. Her approach with its many incentives and rewards has made this process personal and fun for all of us.”

Figure 3.8. Parent goodness-of-fit ratings across four evaluations.
Family Functioning

Family functioning was measured using two family assessment instruments: (a) Family Quality of Life Survey (FQOL) (Park et al., 2003); and (b) Parenting Stress Index (PSI) (Abidin, 1995; Lloyd & Abidin, 1984). The results for each assessment instrument are described below.

Family quality of life. Table 3.1 presents the average satisfaction score across five quality of life domains in the FQOL (Park et al., 2003) before and after the implementation of the support process (1 = very dissatisfied; 5 = very satisfied). The data suggest that following eight months of implementation support there was minimal change in quality of life for all three families. For Robbie and his family, the average satisfaction scores suggest only a modest improvement in quality of life from baseline to intervention (3.9 pre-intervention; 4.1 post-intervention). Specifically, from the mother’s perspective the greatest positive shift appeared to be in the area of physical/material well-being (4.0 pre-intervention; 4.8 post-intervention). However, in regards to family interaction, the mother’s level of satisfaction decreased from 4.6 pre-intervention to 4.0 post-intervention. A possible reason for a downward shift in the area of family interaction was the father’s return to work after a four-month strike that ended a month into intervention. His long hours as a movie production designer left him with little time for interactions with his family. For Luke and his family, average satisfaction data suggest a slight deterioration in quality of life from baseline to intervention (3.5 pre-intervention; 3.4 post-intervention). From the mother’s perspective, the greatest positive shift appeared to be in the areas of family interaction (2.2 pre-intervention; 3.3 post-intervention). However, in regards to supports for persons with disability, the mother’s level of satisfaction decreased from 4.8 pre-intervention to 3.8 post-intervention. One possible reason for a downward shift in this area is
that many of Luke’s support persons from his community based early intervention team stopped working with Luke at the beginning of the summer (when the post-intervention measure was gathered). As a result, with the exception of intervention during the dinner routine, Luke had very little intervention for the duration of the summer. For Josh and his family, average satisfaction data suggest only a slight improvement from baseline to intervention (4.2 pre-intervention; 4.6 post-intervention). Specifically, from the mother’s perspective, the greatest positive shifts were in the areas of family interaction (3.8 pre-intervention; 4.8 post-intervention) and supports for persons with disability (4.5 pre-intervention; 5.0 post-intervention).

Table 3.1.

Quality of Life Ratings

<table>
<thead>
<tr>
<th>Domain of Family Quality of Life Scale</th>
<th>Robbie Baseline</th>
<th>Robbie Follow-up</th>
<th>Luke Baseline</th>
<th>Luke Follow-up</th>
<th>Josh Baseline</th>
<th>Josh Follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family Interaction</td>
<td>4.6</td>
<td>4</td>
<td>2.2</td>
<td>3.3</td>
<td>3.8</td>
<td>4.8</td>
</tr>
<tr>
<td>Parenting</td>
<td>4</td>
<td>4</td>
<td>3.3</td>
<td>3</td>
<td>4.5</td>
<td>4.2</td>
</tr>
<tr>
<td>Emotional Well Being</td>
<td>3.5</td>
<td>3.8</td>
<td>2</td>
<td>2.5</td>
<td>3.3</td>
<td>4</td>
</tr>
<tr>
<td>Physical/Material Well Being</td>
<td>4</td>
<td>4.8</td>
<td>4.4</td>
<td>4.4</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Supports for Persons With Disability</td>
<td>4.3</td>
<td>4</td>
<td>4.8</td>
<td>3.8</td>
<td>4.5</td>
<td>5</td>
</tr>
<tr>
<td>Total Score of Family Quality of Life</td>
<td>3.9</td>
<td>4.1</td>
<td>3.5</td>
<td>3.4</td>
<td>4.2</td>
<td>4.6</td>
</tr>
</tbody>
</table>
Parenting stress ratings. Table 3.2 presents each mother’s total parenting stress score, and child and parent domain stress scores from the PSI (Abidin, 1995). Total stress scores between the 15th and 80th percentile are considered to be within the normative range, while scores at or above the 85th percentile are considered to fall in the clinical range. The data suggest that following eight months of implementation support, little change in parenting stress was observed across all three families. Specifically, following eight months of implementation support, Robbie’s mother showed little change in total stress with scores remaining at the 95th percentile (287 pre-intervention; 282 post-intervention). For Luke’s mother, although the data show a decrease in total stress from baseline to intervention (388 pre-intervention; 342 post-intervention), stress scores remained very high at the 99+ percentile. For Josh’s mother, the results show an increase in stress from baseline to intervention (239 pre-intervention; 252 post-intervention), however the scores remained in the normative range below the 80th percentile.

The PSI also includes an additional measure for defensive responding, which examines social desirability by assessing respondent bias in presenting a favourable impression of herself or himself or the tendency to minimize problems or stress in the parent-child relationship. A score of 24 or less indicates that the individual may be responding in a defensive manner and caution should be taken with interpreting the scores. In the present study there were no scores to indicate the presence of defensive responding. Social desirability scores ranged from 35 to 44.
Table 3.2.

Parenting Stress Ratings

<table>
<thead>
<tr>
<th></th>
<th>Robbie</th>
<th>Luke</th>
<th>Josh</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Baseline</td>
<td>Follow-up</td>
<td>Baseline</td>
</tr>
<tr>
<td>Child Domain</td>
<td>145</td>
<td>150</td>
<td>189</td>
</tr>
<tr>
<td>Parenting Domain</td>
<td>142</td>
<td>132</td>
<td>199</td>
</tr>
<tr>
<td>Total Score</td>
<td>287</td>
<td>282</td>
<td>388</td>
</tr>
</tbody>
</table>
CHAPTER 4
DISCUSSION

Summary of the Results

The present study addressed two experimental questions and seven descriptive questions about the efficacy of an ecological behavioural feeding approach for: (a) improving child eating behaviour; (b) empowering parents to build a successful mealtime routine based on their vision; and (c) transforming coercive parent-child interactions into constructive interactions in the context of meal routines. The results, comprised of multiple outcome measures suggest that these questions have been answered fully and affirmatively.

First, the study demonstrated a functional relationship between implementation of an ecological behavioural approach and improvements in child behaviour. Following parent implementation of the ecological behavioural approach, problem behaviour decreased to low, socially valid levels for all three participants (average of 9% during maintenance phase). Consumption of new, non-preferred foods also improved following intervention. By the end of the initial training phase of intervention, all three children were successfully consuming age appropriate portions of the 12-targeted foods at a rate acceptable to their parents (average = 1.6 bites/min). Following implementation, the children and their families were able to successfully participate together in valued meal routines, as indicated by the high average of steps completed (85%) across participants. Most important, at three months post-intervention, improvements in child behaviour and routine participation were maintained.

Statistical analysis partly moderated the interpretation of these outcomes, suggesting strong effects for problem behaviour and routine participation for two of three children and relatively strong effects for bites consumed per minute for two of three children. The absence
of statistically significant effects for all three of Robbie’s dependent variables may be attributed to the low statistical power inherent in time series data in which the baseline phase is comprised of only 5 data points. Although Crosbie (1993) has indicated that 5 data points per phase are the minimum necessary to conduct a statistical analysis using ITSACORR, he also noted that under certain conditions this number may be insufficient. Notwithstanding, overall single subject design data document the effectiveness of the ecological approach for promoting meaningful and durable changes in each child’s behaviour and participation in meal routines.

Second, implementation of an ecological behavioural feeding approach was associated with improvements in parent-child interactions during meal routines. Specifically, sequential analysis results of aggregated baseline data across the three families documented a strong and stable four-step pattern of escape driven coercion as described by Patterson and colleagues (1982), in which a parent demand followed by child problem behaviour predicted the parent withdrawing their demand and the child terminating problem behaviour. During intervention, although a weak but stable pattern of parent demand followed by child problem behaviour continued to occur, the results indicated that the remaining two steps of the classic escape-driven coercive process did not occur. Also during intervention, a strong and stable four-step constructive process emerged in which parent demand followed by child compliance predicted the parent providing positive attention (e.g., praise, affection) and the child reciprocating with positive attention or engaging in acceptable mealtime related behaviours (e.g., continuing to eat, wiping mouth, taking a drink). Although, the first two steps in the constructive process of parent-child interactions occurred during baseline, the magnitude of this process was much greater following implementation of the behaviour support procedures. Taken together, child behaviour, routine participation, and parent-child interaction data offer preliminary evidence of
the transformation of coercive processes into constructive processes in valued meal routines across the three families. However, in the absence of follow up data beyond three months, this interpretation should be viewed as tentative at best.

Further evidence of the efficacy of the support approach was found in (a) high ratings of social validity for plan goals, procedures, and outcomes; and (b) high parent ratings of goodness-of-fit between the support plan and the family’s ecology. Less convincing, however, were the family functioning outcomes. Following 8 months of intervention, two of three parents reported modest improvements in family quality of life and parenting stress. Clearly intervention with each family in only one valued home-based meal routine was not sufficient to promote improvements in overall family quality of life or parenting stress.

High parental treatment integrity data for the support strategies suggest that the parent training and support procedures employed (e.g., modeling, coaching, implementation checklist, coercive process checklist) were efficacious in: (a) developing each mother’s capacity to effectively support her child’s participation in a valued meal routine; and (b) empowering each mother to support her child to expand their repertoire of accepted foods. A decrease in parental treatment integrity data from intervention to follow up and maintenance of child progress during follow up suggest that the parents over time did not need to use the behaviour support strategies as much to maintain child progress.

During maintenance and follow up, the mothers reported several collateral effects for their child and family. For example, all three children expanded their diet beyond the 12 foods targeted for intervention. At the end of follow up, Robbie was accepting 29 foods, Luke was accepting 33 new foods, and Josh was accepting 21 new foods. The families also reported success with getting their children to eat at restaurants, at birthday parties, and at gatherings
with extended family members. The successes Josh’s family experienced are reflected in the following comments made by Josh’s mother on her social validity questionnaire during follow up: “Our whole family life has improved so much since [Josh] started eating a more diverse diet. Eating out at restaurants is an easy and pleasurable experience. Birthday parties are easier as well.”

Luke’s mother also reported that with an increase in Luke’s caloric intake due to all the new foods in his diet, he no longer required 4 bottles a day of milk and Pediasure®. Instead, Luke received a glass of milk in the morning to help him swallow his seizure medication. With less milk and more fruits and vegetables in his diet, Luke’s mother also reported that he began to have regular bowel movements and thus no longer required a weekly enema.

Josh’s mother reported during maintenance that with Josh receiving more nutrition through food, it was easier for her to manage his diabetes. She reported that there were considerably fewer incidents of Josh’s blood sugar levels rising or dropping to dangerous levels. In addition, given that Josh was receiving more calories through food, he required fewer glasses of Glucerna® each day. In addition, with more fibre in his diet, Josh’s mother reported that he started to have regular bowel movements.

Findings in Relation to the Literature

The study contributes to and extends several findings in the feeding literature. First, the study replicates and extends the previous work of Binnendyk and Lucyshyn (2009) by using an experimental design instead of a case study design to evaluate the efficacy of an ecological behavioural feeding approach to improve child eating behaviour and routine participation during valued meal routines. The study strengthens the internal and external validity of such an approach by demonstrating a functional relationship between implementation of the ecological
behavioural feeding approach and substantial improvements in child eating behaviour and routine participation for three young children with autism and severe food refusal behaviour.

The study adds to a growing body of evidence of the utility of functional assessment procedures for understanding the behavioural mechanisms that maintain food refusal behaviors (Galensky et al., 2001; Girolami & Scott, 2001; Levin & Carr, 2001; Luiselli, 2000, Werle et al., 1993). The study also extends the use of functional analysis procedures into home settings with parents implementing naturalistic conditions that test hypotheses about the functions of problem behaviour. Evaluating the effects of parent-implemented experimental functional analysis procedures represents an emerging theme in the behavioural feeding literature (e.g., Najdowski et al., 2003). Consistent with Najdowski et al., assessment findings revealed that all three children primarily engaged in food refusal and other problematic mealtime behaviours to escape consumption of non-preferred foods. This information was then used to design multicomponent interventions that were logically linked to the purpose of problematic feeding behavior and the factors that set up or triggered such behaviors.

Outcomes from the study provide further evidence that in severe cases of food refusal behaviour, in which the coercive process of interaction between the parent and child is well established, it is useful and potentially more efficient to have the interventionist promote the initial change in eating behaviour (Binnendyk & Lucyshyn, 2009; Linscheid, 2006). Because the interventionist did not share the stimulus control and negative reinforcement history that the parent and child had with each other, the interventionist was more likely to succeed with the initial implementation of proactive and teaching strategies and less likely to provoke as long or as intense of an extinction burst when withholding negative reinforcement for food refusal behaviour (i.e., continuing to present the demand to eat the food). Once the child’s
eating behaviour was brought under the stimulus control of five foods with the interventionist, stimulus control of eating was systematically transferred from the interventionist to the parent within a four step process: (a) parent observed the interventionist modeling the behavioural feeding strategies and was prompted by the interventionist to praise their child for acceptance of food; (b) parent practiced/role played the feeding procedures with the interventionist outside the feeding session (Werle et al., 1993); (c) parent fed the child while the interventionist provided coaching, feedback, and positive reinforcement; and (d) parent fed the child with the interventionist not present. In the present study, delaying parent involvement until the child’s eating behaviour had improved helped to minimize the negative impact problem behaviour had on the parent and family and thus may have reduced the risk of parents prematurely terminating treatment (Galensky et al., 2001; Werle et al., 1993). High social validity ratings for all three families lend support to this supposition. Interventionist-initiated feeding intervention is an approach commonly used in in-patient or day treatment programs in a clinic setting and has been shown to be effective (e.g., Piazza et al., 2003; McCartney et al., 2005). Results from this study suggest, however, that with adequate medical monitoring and close professional support, similar outcomes are obtainable with an interventionist-initiated feeding intervention in the home. The average number of sessions required to teach the child to accept six new foods in the family’s home was seven sessions across a two-week period. In a clinic setting, those seven sessions are likely to occur within two and half days (Linscheid, 2006). However, there might be greater efficiency of outcomes when intervention starts in the home because transferring stimulus control to the parent in the natural mealtime setting may be more efficient compared to intervention that is first initiated in a clinic setting. Future research comparing the efficiency of each approach is warranted.
The study offers another example of the usefulness of the activity setting as a unit of analysis and intervention (Binnendyk & Lucyshyn, 2009; Clarke, Dunlap, & Vaughn 1999; Lucyshyn, Albin, & Nixon, 1997; Moes & Frea, 2002). Family activity settings are the routines of everyday life in which child behaviour and parent-child interactions are embedded. By taking time to understand the objective and subjective elements that comprise the targeted meal routine (e.g., people, tasks, goals and values, patterns of interaction), feeding interventions were developed that participating families viewed as possessing a good fit with each family’s meal routine and family life. In collaboration with family members, support strategies were selected that: (a) incorporated family goals and values; (b) built upon family and child strengths; (c) utilized resources available to the family; and (d) sought to minimize stressors. The fit between the behaviour support plan and the family’s ecology was further refined by ensuring interventions were congruent with elements of the envisioned meal routine; that is, time and place, people present, targeted foods, resources, tasks and their organization, goals and values, and parent and child interactions.

For example, for Luke’s family, the intervention plan addressed setting factors such as the presence of his older brother at dinner. During intervention, the effort required to successfully support Luke at dinner left the mother with little opportunity to also attend to her other son’s needs. As a result, Luke’s older brother began to engage in problem behaviours to get attention from his mother. In response to these behaviours, a self-management chart with a built in reward system was employed to motivate Luke’s brother to engage in acceptable mealtime behaviours. In addition, activities used to motivate Luke to eat his food (e.g., books, stickers) were changed to activities that allowed for more participation from Luke’s older brother (e.g., trivia games, I spy games).
For Robbie’s family, the plan addressed family goals of eating at restaurants and learning positive parenting strategies. First, target foods selected for intervention at home were foods often found on a children’s menu at restaurants (e.g., fish sticks, hamburger, hot dog, and chicken nuggets). Second, the behaviour support plan emphasized the use of positive, proactive strategies to motivate Robbie to eat new foods. Most important was the strategy of simultaneously presenting a preferred and non-preferred food. By presenting a new food (e.g., chicken, carrots, peas) simultaneous with a highly preferred food (e.g., chocolate, cookie, macaroni and cheese) Robbie was more likely to accept the new food with minimal problem behaviours.

For Josh’s mother, the plan addressed setting factors such as the coming and going of his younger brother, who was disrupting the snack routine. Specifically, a set of activities (e.g., puzzles, music box, figurines) were set up for Josh’s younger brother to keep him safe and busy while his mother supported Josh during snack. In addition, the plan addressed the goal of teaching Josh to eat foods that were “diabetic friendly.” Foods targeted for intervention included foods high in protein (soy-based foods, peanuts, cheese, and bacon) and high in fibre (whole wheat tortillas, vegetables, bananas, apples). Attention to these contextual variables in plan design was associated with the implementation of a multicomponent behavioural feeding intervention that was effective in ameliorating problematic feeding behaviours for three young children and was perceived by the mothers to be acceptable and feasible.

**Contributions**

This study offers five unique contributions to the feeding literature on behavioural interventions: (a) documentation of coercive processes during meal routines; (b) documentation of constructive processes during meal routines; (c) measurement of conditional
probabilities of parent-child interaction during meal routines; (d) a socially valid method for observing coercive processes; and (e) an ecological model of assessment and intervention for young children with developmental disabilities and food refusal behaviour.

*Documentation of Coercive Processes During Meal Routines*

Drawing on the behavioural family intervention literature on coercion theory with aggressive boys (Patterson et al. 1982) and with children with developmental disabilities and problem behaviour (Lucyshyn et al., 2004) the study expands this literature in this area by offering empirical evidence of the bi-directional role of coercive parent-child interactions in the development and maintenance of severe feeding disorders. To date, feeding studies have only commented on the importance of broadening assessment procedures beyond functional assessment of child behaviour to include an examination of the parent-child feeding relationship (Davies et al., 2006; Kerwin, 2003, Sanders et al., 1993). This is the first study in the feeding literature to offer empirical evidence of four-step coercive processes operating in mealtime routines among families of children with developmental disabilities and severe food refusal behaviour. Results from this study indicate that, similar to the findings of Patterson and colleagues, young children with developmental disabilities and food refusal behaviour are likely to use coercive control tactics to influence parent behaviour. Parents become unwilling partners in this dance of coercion by submitting to the child (i.e., withdrawing the demand to eat non-preferred foods), thus negatively reinforcing child food refusal behaviour. The child in turn, negatively reinforces parental submission by terminating problem behaviour. Such a pattern is difficult to interrupt and change, not only because the interaction happens so quickly but also because negative reinforcement is a powerful mechanism for learning (Reid & Eddy, 2002). As a result, parents stop making demands on their child to eat new foods, withdraw, and
become disheartened (Reid & Eddy, 2002). In this study, prior to intervention, Robbie’s mother reported that she no longer tried to get Robbie to eat new foods and instead fed him foods that he would willingly accept. Luke’s mother reported that she stopped trying to get Luke to come to the table 2 years prior to the commencement of the study. Moreover, the success of Luke’s preschool teachers in getting Luke to eat new food made his mother feel incompetent in her parenting skills. For Josh’s mother, her repeated failure to expand his diet beyond chips and cookies left her feeling discouraged and partly to blame for his recent diagnosis of diabetes.

Consistent with Lucyshyn et al. (2004) and Floyd and Phillippe (1993), the pattern of coercion evidenced in this study differed from Patterson’s theory of coercion in that the parent did not escalate into intense aversive behaviour in response to their child’s persistent problem behaviours. Despite a high frequency of child problem behaviour during baseline, parents responded most often to their child’s problem behaviour with patience, encouragement, and affection (e.g., PPA, POT).

Documentation of Constructive Processes During Meal Routines

This is the first study in the feeding literature to offer empirical evidence of the emergence of constructive processes of parent-child interaction following intervention in mealtime routines among families of children with developmental disabilities and severe food refusal behaviour. Results showed that following implementation of the ecological behavioural feeding intervention there was an improvement in the quality of parent-child interaction. Children were more likely to respond to parent demands to take a bite of food with compliance. Parents in turn positively reinforced child compliance by offering praise, affection, and/or preferred foods or activities. The child then reciprocated with acceptable mealtime behaviours.
Examples of acceptable mealtime behaviours included eating more food, using a napkin, talking with family members, or drinking from a cup. Further evidence of improvements in the quality of parent child interaction following intervention included an increase in the rate of positive parent behaviours (e.g., praise, affection, and offering choices) from 1.0 per minute during baseline to 3.0 per minute during intervention. Child positive behaviours (e.g., affection, humour) also increased from .03 per minute during baseline to .07 per minute during intervention. In addition, results showed that the conditional probability of the parent and child engaging in conversational exchanges increased from .29 during baseline to .75 in intervention.

Measurement of Conditional Probabilities of Parent-Child Interaction During Meal Routines

The study strengthens the internal and external validity of the Parent and Child Coding System (PACCS) (Lucyshyn et al., 2007) by replicating and extending its use to document the presence of coercive processes of parent-child interaction during baseline and the emergence of constructive processes of interaction during intervention. Sequential analysis has long been viewed as a method for describing what Shoenfeld refers to as a behavioural stream (Delprato, 1987; Sharpe, Balderson, & So, 2004). In this view, behaviour occurs as a continuous stream of events flowing from the past to the present to the future. Sequential analysis is able to identify relationships among multiple ongoing behaviours and events as they naturally occur across time (Delprato, 1987). The PACCS coding system, with its mutually exclusive and exhaustive set of parent and child codes supported the use of sequential analysis to explicitly investigate patterns of parent and child behaviour that occurred within the complex, interactive milieu of family meal routines. Most important, the sensitivity of the measurement system to the presence of both coercive and constructive patterns of parent-child interaction allowed for documentation of changes in these patterns of interaction following implementation of the
behavioural feeding intervention. Specifically, during baseline, sequential analysis data revealed a strong and stable four-step coercive pattern of parent-child interaction. Following intervention, however, the stability of the third and fourth steps in the coercive process was shown to no longer exist. The parent was less likely to respond to their child’s food refusal behaviour by withdrawing the demand to eat. Instead, the parent implemented proactive strategies that prevented food refusal and consequence strategies that empowered the parent to persist in the face of problem behaviour until the child submitted and ate the food. Since behaviour occurs as a continuous stream, “there are no empty spaces in the behaviour stream [and so], to inhibit responding anywhere is to replace one response with another” (Martens & Witt, 1988, p. 130). By learning to persist, the parent replaced their earlier response of removing the demand. By accepting the food, the child positively reinforced the parent’s use of effective parenting strategies. The parent in turn positively reinforced the child’s acceptance of new foods by offering praise, affection, and preferred food or activities. The child then reciprocated with acceptable mealtime behaviour, which reinforced the parent’s use of positive consequence strategies. The reciprocal effects of positive parent and child behaviour led to the emergence of a strong and stable four-step constructive pattern of interaction during meal routines. Using the PACCS coding system to sequentially analyze parent and child behaviour provided an opportunity to understand in more detail the processes by which behavioural feeding interventions have their effects on parent-child interaction during natural meal routines.

_A Socially Valid Method for Observing Coercive Processes_

Another contribution is the way in which coercive patterns of parent-child interaction were captured during natural meal routines. One of the methodological challenges of
conducting sequential analysis research in natural settings such as a family’s home is the very large number of dyadic interactions that are needed to meet the statistical assumptions upon which sequential analysis is based (Bakeman & Quera, 1995; Gottman & Roy, 1990). In this study, as many as 50 to 60 iterations of the four-step coercive process were needed in order to statistically test for its presence during baseline and intervention conditions. A related challenge is the difficulty in observing escape-driven coercive processes in naturally occurring family routines. First, under natural conditions parents are unlikely to attempt to engage their child in the expectations of an unsuccessful routine more than once or a few times. Second, when parents are asked to engage their child in the expectations of an unsuccessful routine for 5-15 minutes (in order to increase the opportunity to observe coercive exchanges), some parents, as experienced by Lucyshyn et al. (2004), tend to unnaturally persist with demands on the child until the routine itself is terminated. For this reason, I implemented an observation procedure designed to ensure that sufficient iterations of the coercive process could be captured in as natural and socially valid a manner as possible (Lucyshyn et al., 2009). First, to ensure that observations captured the natural process of parent-child interaction, initial screening activities were conducted to clinically verify that a four-step, escape driven coercive process occurred during family meal routines. Second, informed by the initial screening activities, a “break” procedure was designed. A break defined how the parent naturally responded to their child’s food refusal behaviour; that is, the specific way in which the parent terminated demands to eat non-preferred foods. The break procedure reduced parent reactivity to the observation protocol, in the form of persistent demands, by allowing the parent to terminate demands to eat non-preferred foods when they would naturally do so during a routine without also terminating the routine altogether. The procedure also provided parents with a safe and acceptable way to
re-engage the child in the expectations of their envisioned routine within the same observation session. By asking a parent to try to engage the child in the expectations of the meal routine for 5 to 15 minutes or 5 to 8 times, more than a few iterations of the coercive exchange could be observed in the routine. Given the very large number of interactions necessary to measure a four-step coercive process, the break procedure allowed for multiple interactions to occur in one observation session, thus reducing the total number of observation sessions necessary to measure four-step coercive processes.

Ecological Model of Assessment and Intervention

The study introduces a useful ecological unit of analysis that expands our view of the sources of variability that affect child and parent behaviour during a behavioural feeding intervention. The ecological unit of analysis integrated three levels of understanding: (a) function of child eating behaviour; (b) reciprocal patterns of parent-child interaction; and (c) the physical and social ecology of activity settings. It was supposed that such an ecological unit of analysis would promote the design of effective, acceptable, and durable multicomponent behaviour support plans. First, functional assessment procedures were used to understand the function of problem feeding behaviour. This information was then used to design interventions that were logically-linked to the function of the child’s problematic feeding behaviour and the factors that set up or trigger such behaviours. Second, micro-social patterns of parent-child interaction within problematic meal routines were assessed and support procedures were designed to empower parents to consistently disrupt and dismantle these maladaptive patterns of interaction. Third, the activity setting as a unit of analysis was used to: (a) develop a family-driven vision of successful meal routines; and (b) design support plans that possessed a good contextual fit with key elements of each family’s envisioned meal routine.
The plan design process was associated with implementation of a behavioural feeding intervention that proved to promote change that was more complete than what is currently documented in the feeding literature. The change documented extended beyond a unitary focus on improving child eating behaviour to a multivariate focus on transforming coercive parent-child interactions in meal routines. Specifically, intervention and support procedures were effective in: (a) improving child eating behaviour and routine participation up to three months post-intervention; (b) teaching parents to use the support procedures with fidelity; (c) empowering parents to overcome well established coercive process to form strong and stable constructive processes; and (d) empowering parents to teach their child to eat many new, non-trained foods and to support their child to eat in non-trained settings (e.g., restaurants, relative’s home, birthday parties).

Although, these outcomes suggest a transformation in parent-child interactions, proof of this supposition requires a comparative analysis be conducted to statistically analyze the change observed from baseline to intervention in coercive and constructive parent-child interactions. In addition, more follow up data is needed. This is especially important given that during intervention, the first two steps in the coercive parent-child interaction did not altogether disappear. The child, on occasion, was observed to use coercive control tactics in an attempt to get their parent to withdraw their demand. Although parents learned to be vigilant in such situations and not submit to their child, additional follow-up data is needed to assess the long-term durability of these behavioural improvements.

**Implications**

Results of this study offer several implications for practitioners and researchers who are involved in behavioural feeding interventions.
Assessing Coercive Patterns of Parent-Child Interaction

In addition to a functional assessment, formal assessment procedures should include an assessment of the social interactional processes that occur within problematic mealtime routines. Functional assessment procedures help to understand the behavioural mechanism that maintains child food refusal behaviour (e.g., negative reinforcement). The functional assessment procedures essentially define the first three steps in a coercive exchange: (a) parent request or demand that child eat non-preferred food; (b) child engages in food refusal behaviour; and (c) parent withdraws the demand to eat the non-preferred food. This information is then used to design intervention strategies that are logically linked to the purpose of the child’s problematic feeding behaviour and the factors that set up or trigger such behaviours. Assessment of coercive parent-child interaction helps to understand the mechanism that maintained ineffective parenting practices. Of particular importance is an examination of the fourth step in the coercive process. This step involves the children negatively reinforcing parent submission by terminating food refusal behaviour. The parents’ experience of negative reinforcement increases the likelihood that in the future that he or she will engage in behaviours that served to terminate child problem behaviour (e.g., withdraw the non-preferred food, give a preferred food, provide positive attention). Over time, with much practice, such parent-child coercive exchanges may become automatic and highly resistant to change (Dumas, 2005). This study suggests that without an assessment of the effects of the child on parent behaviour, the survivability of a feeding intervention may be compromised. Given a parent’s past history of experiencing negative reinforcement, one cannot be assured that the parent will be able maintain the use of evidence-based behavioural strategies over a long period of time (i.e., months and years). Accordingly, to understand the effects of child
behaviour on parent behaviour, one additional question should be asked during a functional assessment: What does the child do after the parent withdraws or terminates their request or demand to eat? If the results of the functional assessment interview and observations indicate that the child reliably terminates or reduces problem behaviour, then it is likely that a coercive process is in effect. These assessment findings then have several implications for intervention. First, at the end of the assessment process, the parent is apprised of the coercive dance operating in their family meal routine. Through a conversation filled with warmth and empathy the interventionist explains to the parent the processes by which child problem behaviours and ineffective parenting strategies are maintained. Teaching parents to become aware of the effects of child behaviour on parent behaviour is an initial step in helping them to overcome these automatic and powerful coercive parent-child interactions (Reid, Patterson, & Snyder, 2002). In this study, after the completion of assessment activities, the interventionist met with the parents and reviewed the four step coercive process that was occurring within their respective meal routine. For each mother, it was almost a revelation to learn that the child terminating problem behaviour served to reinforce parental submission. Specifically, the parents were unaware that over time their child calming down had inadvertently taught them to change their demand to one less aversive (e.g., reduce the number of bites or size of bites), to give up sooner to avoid an escalation, or in the case of Luke’s mother, to give up altogether. Second, given that the coercive process of interaction between the parent and child is often well-established, an efficient and effective way to begin the feeding intervention is to have the interventionist promote the initial change in child eating behaviour. In the present study, the interventionist taught each child to eat five or six new foods before transferring the support procedures to the parent. Third, during implementation support, because the parent is required
to make significant and often difficult changes in their own behaviour, a strong, trusting, collaborative partnership with the interventionist is essential if parents are to gather the energy and courage that is necessary to change patterns of interaction with their child that have been going on for years. In addition, the interventionist must act as a support and coach throughout the time it will take parents to disrupt and dismantle coercive patterns of interaction. As experienced in this study, this is often not a quick process, but one that unfolds over a period of several months. Fourth, after parents succeed in transforming a problematic meal routine into a successful one, they are taught to use a coercive process assessment tool to self-monitor and self-evaluate whether a coercive process has returned. In this study, completing the self-monitoring tool once a week gave the parent an opportunity to recognize if the previous coercive patterns of interaction had returned or not. The tool also was used to guide discussions with parents about the occurrence or non-occurrence of coercive processes for the purpose of strengthening the family’s awareness and conceptual understanding of coercive processes and how to prevent or recover from them.

Assessing Current and Desired Mealtime Routines

The ultimate criterion for success of a feeding intervention in this study was whether the children’s parents were able to successfully embed behaviour support plan procedures within the natural milieu of family mealtimes. Parents met this criterion by demonstrating the ability to support their child with food refusal in the midst of an envisioned dinner or snack routine with all of its attendant complexities. During mealtimes, parents were able to fulfill other family functions such as eating their own meal, conversing with one’s partner, attending to the other child at the table, and responding to family members’ requests. Successful inclusion of the child with food refusal in family mealtime routines is critically important
considering the rich number of social and learning opportunities available to children when family members sit at the table and eat a meal together (Snow & Beals, 2006).

Supporting a family to achieve such an outcome requires an assessment of current problematic mealtime routines and a family-driven vision of what a meaningful, feasible, and successful mealtime routine would look like. The process as described by Lucyshyn et al. (2002) involves families identifying valued but problematic meal routines and then prioritizing the routines for further assessment and intervention. Targeted routines are defined in terms of the key elements of an activity setting (e.g., time and place, persons present, resources, tasks, goals and values, patterns of interaction). Because of natural variations in family meal routines, the envisioned routine also should include changes in structure that may occur across the span of a week or month. For example, Robbie’s dinner routine varied according to who was present (e.g., father, aunt, family friend), the time dinner occurred (e.g., 5:30 before skating lessons, 7:00 pm when dad was home), and the types of foods served (one dish meal, take-out). A broad understanding of the structural elements of a mealtime routine can inform the design of a contextually appropriate behaviour support plans in which intervention strategies are effectively embedded in the routine, implemented by family members, and adapted to common changes in routine structure.

Using General Case Instructional Programming to Promote Generalized Food Acceptance

In this study, given that the target routine was a meal routine, each family’s vision of success naturally included a description of the types of foods they wanted their child to eat. All three families expressed a desire to have their child eat a range of foods across all food groups (e.g., fruits, vegetables, meats or meat alternatives, grains, and dairy). Designing a feeding intervention to target such a wide range of foods is unquestionably a daunting task. A logical
solution to this problem is to use a general case instructional approach to promote generalization of child’s eating behaviour (Horner & Albin, 1988). This strategy involves establishing an instructional universe of foods and then from this universe sampling a range of relevant stimulus properties and response requirements that would occur during a targeted meal. During assessment, the interventionist can ask the parents to select foods they would like their child to eat that varies according to the following dimensions: (a) type of food (e.g., fruit, vegetable, soup, pasta dishes, meat); (b) taste (e.g., savory, sweet); (c) texture (e.g., crunchy, smooth, lumpy); and (d) appearance (e.g., color, number of ingredients). Instructional examples are then selected that adequately sampled the range of stimulus properties and response requirements within the family-defined instructional universe of foods. Examples would then be sequenced for instruction, with maximally different examples presented during a training session. The desired outcome of a general case approach is that once the child accepts the targeted foods, child food acceptance will generalize to other non-trained food within the instructional universe. In this study, anecdotal parental reports suggest that all three children generalized food acceptance to other non-trained food within the instructional universe. By the end of the study, each child was accepting a minimum of 20 new foods. Most important, was that many of the non-trained foods introduced to the children occurred during follow-up, when there was no support from the interventionist. Given the enormous challenge presented to interventionists and parents when teaching a child to eat a wide range of foods, an essential feature of feeding interventions should be a generalization promotion strategy such as general case programming.
If practitioners wish to promote meaningful and durable changes in child feeding behaviour, then ongoing maintenance support by the interventionist to the family may be necessary (Carr et al., 1999). In the present study, each family encountered a number of unavoidable setting events (e.g., child surgery, child illness, summer vacation, transition to a new school) that either had the potential to or did disrupt progress. With continuous monitoring and support, the interventionist was able to help the family predict and plan for the impact of an imminent setting event, provide a framework for analysis, and devise a plan to prevent the event from occurring or minimize its negative effects. For example, before Luke’s scheduled eye surgery during the maintenance phase of intervention, the interventionist met with the mother to analyze the potential impact of the surgery on his progress and develop an adjunctive plan to prevent a disruption in the routine. The plan included: (a) feeding Luke easy, preferred foods in a setting most comfortable to him (e.g., at computer, in front of television) for a minimum of three days following his surgery; (b) once Luke was feeling better, setting smaller, more manageable expectations for type and amount of food to be consumed; and (c) increasing reinforcement for desired mealtime behaviours (e.g., introduce a new game or activity at dinner).

Once the family had returned to the level of progress previously attained, the adjunctive plan became part of the larger behaviour support plan and served as a tool for addressing future setbacks to the routine that were of a similar nature (e.g., illness, a seizure). As this example suggests, each challenge that a family overcomes provides parents with an opportunity to fortify their knowledge and skills in supporting a child with an eating behaviour. Adopting such a longitudinal perspective can encourage the interventionist and family to view setbacks
as not merely a regression in progress but also as a valuable lesson that can contribute to a family’s resilience against future challenges.

Cautions

Potential for Regression for One Child and Family

Two of the participants in the study (Robbie and Josh), showed stable improvements in eating and mealtime related behaviours during initial training, maintenance support, and follow up. For the other participant, Luke, regressions in problem behaviour at the beginning of maintenance and at the beginning of follow up suggest that the change in his behaviours was more fragile. He continued to engage in problem behaviours during the envisioned dinner albeit at low levels of frequency and intensity. Thus, the possibility of regression is present. The mother’s fatigue, the lack of support from Luke’s father due to his long hours at work, child illness or fatigue, and the effort required to maintain progress are factors that may contribute to significant deterioration in Luke’s behaviour. Three-month follow up data provide only modest evidence that improvements in Luke’s eating and mealtime behaviours may endure, and that the family continues to find the feeding intervention effective, acceptable, and feasible. Luke’s recovery from setbacks during the maintenance phase of intervention (e.g., illness, surgery, vacation) and the mother’s verbal reports, during follow up, of continued success with generalizing Luke’s eating to new foods and new contexts (e.g., coffee shop, relative’s home, restaurants) are encouraging. Nevertheless, the extensiveness of Luke’s problem behaviour repertoire and the long history coercive of parent-child interaction requires caution and additional follow-up data to assess the long-term durability of behavioural improvements.
Moderate Family Functioning Outcomes

One caution when interpreting the results of the study is that following eight months of intervention, there was little to no improvement in family quality of life and parenting stress for each mother. These findings differed from an earlier study conducted by Binnendyk and Lucyshyn (2009) in which family quality of life for one family improved substantially following intervention during a snack routine. Four reasons may account for this difference in findings.

First, little to no improvement in family functioning suggests that intervention in only one meal routine with each family was not sufficient to address the larger family issues that may have affected the quality of life of participating families (e.g., marital dissatisfaction, maternal depression, lack of social supports). Although intervention within a family routine offers a window into the larger ecology of the family, in this study, intervention only addressed features of family ecology that potentially affected child progress or parent accurate use of support procedures during a targeted meal routine (e.g., sibling issues, participation of father).

Second, one mother evidenced high scores on the depression subscale of the Parenting Stress Index (Abidin, 1995). For this mother, feelings of depression may have limited improvements in family quality of life outcomes. Compared to mothers who are not depressed, mothers with depression experience more stress in family life (Webster-Stratton & Hammond, 1988). Mothers who are depressed tend to perceive themselves as less competent, more socially isolated, and more restricted in their role as a parent (Downey & Coyne, 1990; Webster-Stratton & Hammond, 1988).

Third, two of three mothers reported dissatisfaction in their marital relationships. Mothers reported to have lower marital satisfaction are likely to experience increased stress
and negative perceptions of child adjustment (Webster-Stratton, 1989). Fourth, during follow up, family functioning measures were re-administered at a time when all three children were entering kindergarten. A child entering a new school is considered a major life stressor that may intensify the total stress a parent is experiencing (Abidin, 1995).

In this study, problems in the larger ecology of participating families (e.g., maternal depression, marital conflict) may have been more readily understood and engaged if support was provided in more than one family routine and if fathers also were trained as interventionists with their child with a disability. A more comprehensive approach would inform the provision of adjunctive family supports that addressed sources of stress extending beyond child problem behaviour (Lucyshyn et al., 2009; Singer, Goldberg-Hamblin, Peckham-Hardin, Barry, & Santarelli, 2002). Because some parents in this study experienced maternal depression and/or marital conflict, adjunctive supports that might have contributed to improvements in family quality of life include psychological counseling and marital therapy (Dadds, Sanders, Behrens, & James, 1987; Singer et al., 2002). Such a comprehensive approach, however, extended beyond the scope of this study.

Limitations

Comparative Analysis of Coercive and Constructive Processes

Although sequential analysis results offers evidence of strong and stable coercive processes of parent-child interaction in meal routines during baseline and the emergence of strong and stable constructive processes of parent-child interaction during intervention, caution is necessary when interpreting these results. A more complete statistical analysis of change in coercive processes and constructive processes from baseline to intervention is required before one can verify unequivocally that implementation of the ecological behavioural feeding
approach was effective in improving parent-child interaction during meal routines. However, with only three families and one routine per family, there was insufficient parent-child interaction data to meet all of the statistical assumptions necessary to conduct a statistical analysis of change in interactional processes between baseline and intervention phases (M. Stoolmiller, personal communication, Dec 9, 2008).

A direct test of the statistical significance of change in coercive and constructive processes between baseline and intervention can be conducted in one of two ways. To test the statistical significance of change within each family, conditional probabilities during baseline and intervention are converted to log odd ratios (Bakeman & Quera, 1995). Then a repeated measures t-test is used to compare the change in log odds from baseline to intervention (Wickens, 1993). To meet the statistical assumptions of such a within family analysis of change, a minimum of 10 observations (or 100 minutes across observations) in baseline and 10 observations (or 100 minutes across observations) in intervention are needed for each family (Lucyshyn et al., 2004). To test the statistical significance of change across families, a mixed model repeated measures multivariate analysis of variance can be used (Hays, 1988; Lucyshyn & Irvin, 2002). To meet the statistical assumptions of this more complex analysis of change in interactional processes across families, in addition to a minimum of 10 baseline and intervention observations per family (or 100 minutes of observation per phase), a minimum of 10 family participants also are needed. Unfortunately, neither method was available to this researcher. Regarding the first method, the time and monetary expense necessary to gather and code 10 baseline and 10 intervention observation sessions per family (or 100 minutes of baseline and intervention per family) was beyond this researcher’s means. Regarding the second method, the participation of only three families precluded its use.
Future research should consider single subject research designs that would lend themselves to such a statistical analysis of change in parent-child interactional processes between baseline and intervention conditions. One feasible design that would lend itself to the use of a repeated measures t-test, for example, would be a multiple baseline design across two family routines with one family. The two baselines (i.e., two routines) would assure the feasible collection of 10 observations (or 100 minutes of observation) per research phase. Intervention with only one family would increase the likelihood that resources in terms of time and money for coding was available.

External Validity

The results of the study, although encouraging, are based on support to three children and their families within one home-based meal routine. For this reason, the ability to draw conclusions about the potential impact of an ecological model of support with other families of children with developmental disabilities and severe food refusal behaviour remains limited.

Concerns about external validity also are warranted because of individual qualities each child and family brought to the clinical support and research effort. First, all the children lived in two-parent homes, in middle class neighbourhoods. The parents spoke fluent English and possessed cultural values similar to the experimenter. Second, each mother was deeply committed to supporting their child to eat new foods and possessed strong supports from either their spouse or friends and other family members. The families as a whole also possessed many strengths, including loving kindness and patience. Future research with other families possessing different ecologies and personal qualities will be necessary before the external validity of the approach has a sufficient empirical foundation (Durand & Rost, 2005).
Cost of Measurement

Although observational measurement of microsocial processes is an objective, sensitive and accurate method for documenting the mechanism by which problem behaviour develops and is maintained within parent-child interactions (Snyder & Stoolmiller, 2002), it cannot be characterized as inexpensive in terms of time and effort. First, learning the PACCS coding system and coding parent and child interaction in real time was a time-consuming process. The experimenter and second coder participated in 40 hours of training before reaching a training criterion of agreement to begin coding. Second, weekly consensus meetings were required to ensure accuracy of coding and calibration of coding between coders. Third, a large number of observations (i.e., a minimum of 10 observations per phase across three families) were required to provide the measurement system with enough interactions to conduct sequential analyses of coercive and constructive parent-child interactions (Gottman & Roy, 1990).

Minimal Follow Up Data

Follow up data were collected up to three months following the termination of intervention. Although these data showed an impressive level of maintained improvements across the dependent variables, time constraints prohibited follow up data to be collected beyond three months. With minimal follow up data, this study can only modestly speak to the issue of durability. In order to assess durability of improvements in child behaviour and parent-child interactions, data should continue to be collected for a minimum of one year post-intervention (Carr et al., 1999; Eddy, Dishion, & Stoolmiller, 1998).

Recommendations for Future Research

The study offers the following directions for future research. First, the internal validity of the findings would be strengthened if a comparative analysis (e.g., a repeated measures t test
analysis) is conducted to analyze the significance of the change in coercive and constructive processes from baseline to intervention. Second, the external validity of the findings would be strengthened if efficacy of the ecological behavioural feeding approach were replicated across a larger sample of families, including families of different cultures, of different socioeconomic backgrounds, and families in which the father is included in the analysis and implementation of the support effort. The external validity of the approach would further be enhanced if the process were demonstrated with diverse children, including children of different ages, developmental disabilities other than autism, and with children whose food refusal behaviour is the result of more clearly physiological factors (e.g., allergies, gastroesophageal reflux disease, delayed or inadequate oral motor skills). Third, the use of general case programming as a guide to designing feeding interventions that result in generalized improvements in child eating behaviour, although promising, requires empirical validation. Fourth, further research is needed to examine whether a more comprehensive intervention approach across all relevant family meal routines will lead to a broader range of outcomes including improvements in overall family functioning.

Conclusion

Through the use of single subject research and clinical case studies, researchers in the field of applied behavior analysis have made several advancements in their support to families of children with severe food refusal behaviour. Despite these advancements, gaps remain in the feeding literature that may affect whether successful feeding interventions survive in the natural milieu of meal routines. Based on research in applied behavior analysis and clinical and community psychology, the present study evaluated a behavioural feeding approach that integrated child eating behavior, parent-child interaction, and the activity setting of meal
routines into an ecological unit of analysis. It was hypothesized that such an ecological unit of analysis would promote the design of effective, acceptable, and durable multicomponent behaviour support plans. The study examined the efficacy of an ecological behavioural feeding approach for: (a) improving child eating behaviour; (b) empowering parents to build a successful mealtime routine based on their vision; and (c) transforming coercive parent-child interactions into constructive interactions for three families of children with developmental disabilities and food refusal behaviour.

The results show that an ecological behavioural feeding approach was efficacious in improving child eating behaviour and participation within a valued meal routine. In addition these improvements were sustained for three months after the termination of the implementation support process. The study also demonstrated that implementation of an ecological behavioural feeding approach was effective in improving parent-child interactions during meal routines. Strong and stable coercive four step patterns of parent-child interaction that were shown to occur during baseline did not occur during intervention. In addition, the onset of intervention evidenced the emergence of strong and stable four-step constructive patterns of parent-child interaction. Finally, results suggest that parent training support and procedures facilitated each mother’s ability to effectively expand the child’s diet and support the child’s participation in the targeted meal routine.

The findings of this investigation make several unique contributions to the literature on behavioural feeding interventions. First, this is the first study in the feeding literature to offer empirical evidence of four-step coercive processes operating in mealtime routines. Second, the study was the first to empirically document four-step constructive processes of parent-child interactions during meal routines. Third, the study replicates and extends the usefulness of the
Parent and Child Coding System (PACCS) (Lucyshyn et al., 2007) to document the presence of coercive processes of parent-child interaction during baseline and the emergence of constructive processes of interaction during intervention. Fourth, the study offers a socially valid method of capturing coercive processes in natural meal routines. Finally, the study introduces to the behavioural feeding literature an ecological unit of analysis that expands our view of the sources of variability that affect child and parent behaviour during a behavioural feeding intervention. Such a unit of analysis was associated with implementation of a behavioural feeding intervention that proved to promote change that was more complete than what is currently documented in the feeding literature, although more follow up data is needed to verify this supposition.

This approach offers four implications for assessment and intervention. First, in addition to a functional assessment, formal assessment procedures should include an assessment of coercive parent-child interaction. Second, formal assessment procedures also should include an assessment of current and desired mealtime routines. Third, during plan design, a generalization promotion strategy such as general case programming should guide the selection of foods targeted for intervention. Fourth, ongoing maintenance support by the interventionist is essential to promote meaningful and durable change in child feeding behaviour.
REFERENCES


Dear Parent/Guardian,

The purpose of this letter is to inform you of an opportunity to participate in a research study to examine the acceptability, effectiveness, and sustainability of a comprehensive approach to behaviour support with families of children with developmental disabilities and food refusal behaviour. The study is entitled, “Expanding the Unit of Analysis and Intervention for Children with Developmental Disabilities and Food Refusal Behaviour.” This study will be conducted in the Faculty of Education of the University of British Columbia. I am a graduate student (Doctorate) in the Faculty of Education and the Co-Investigator of the study. This research is for the fulfillment of degree requirements for doctoral degree. The Principal Investigator (PI) of the study is Joe Lucyshyn, Associate Professor in the Faculty of Education.

The purpose of this study is to examine the acceptability and the effectiveness of a food refusal intervention using a comprehensive approach to behaviour support with families of children with developmental disabilities and food refusal behaviour. The approach is based on best practice in behavioural support with families. It emphasizes a collaborative process in which family members and the co-investigator work together in equal partnership to improve eating behaviour of the child with a disability, and overall family quality of life. The study will evaluate the extent to which behavioural feeding interventions:

1. Improve child eating behaviour and parent-child interaction in a family meal routine;
2. Promote your child’s successful participation in a meal routine;
3. Empower you and other family members to successfully support the child;
4. Enhance the quality of life of your child and family.

Participation in the study would involve you and your family collaborating with the co-investigator in four family support activities and in four research activities. The four family support activities are:

1. Comprehensive assessment;
2. Development of a behaviour support plan;
3. Implementation support to help you implement the behaviour support plan;
4. Follow-up support for up to three months.
The four research activities are:

1. Preliminary assessment to define meal routines and verify problem behaviour in a family meal routine;
2. Videotaped observations in a family meal routine, under conditions that may produce problem behaviour, to confirm the purpose of problem behaviour;
3. Videotaped observations in a family meal routine to measure the child and family outcomes;
4. Assessment of overall family quality of life.

The entire research study will require approximately 6 months to complete. During the first 3 months your child and family will be involved in support or research activities approximately 2 to 4 hours per week. During the following three months of the study, your child and family’s involvement will decrease. This period of time is called follow-up. It will begin after your child with a disability has improved his or her eating and related mealtime behaviours in the targeted meal routine. During follow-up (the last three months of the study), research and support activities will occur 1 to 2 hours per month.

The family that chooses to participate will need to consider four potential risks: (1) physical; (2) psychological; (3) legal; (4) loss of confidentiality.

1) Physical Risk. Because the child participant engages in problem behaviour, there is more than a minimal risk that the child participant or other family members may experience physical injury during the study. Every precaution will be taken to minimize this risk:
   a. Members of the research team have extensive experience working with children who engage in problem behaviour in the home.
   b. Behaviour support strategies will focus on preventing behaviour problems and on teaching positive behaviour that are designed to replace problem behaviour.
   c. Observation sessions and training and support activities will be terminated if the child participant begins to engage in medium to high intensity problem behaviour.
   d. As needed, the research team will be available to assist the family, the child and other family members during observation sessions, and during training and support activities.

2) Psychological Risk. Because the family will be observed during a home-based meal routine and will participate in training and support activities, the parents, child or other family members may experience psychological risk. That is, the parents, child or other family members may feel some discomfort or stress during these activities. Several steps will be taken to guard against this risk:
   a. During observation sessions the observer will maintain a low profile and not call attention to him or her self.
   b. Any person in the family can terminate an observation session at any time.
   c. ‘Family-friendly’ features of the family support process should help to reduce stress associated with the study.
3) **Legal Risk.** A potential but minimal risk relates to the legal requirements around reporting abuse if it is witnessed. If members of the research team witness any abuse of the focus person by any person, they will have to report it to the appropriate provincial authorities. This risk will be guarded against in the following ways:

a. The study focuses on providing family members with positive, non-punitive ways to prevent and manage child problem behaviour. Family members who develop these skills are unlikely to engage in child maltreatment.
b. If abuse is observed the parents will be informed and invited to participate in reporting the incident. The research team will then refer you to appropriate family support services or a community agency.

4) **Loss of Confidentiality.** There is a risk that the child participant or other family members may experience a loss of confidentiality. To guard against this risk we will:

a. Change names of all persons, places, and programs described in the study;
b. Allow access to information only to members of the research team;
c. Keep all data, notes, and videotapes in a locked file in a secure office; and
d. Data collected solely for the study will be destroyed 5 years after the study is completed.

The family that chooses to participate also may experience three benefits. These are listed below:

a. Your child’s problematic eating behaviour may decrease to near zero levels in the selected meal routine.
b. Your child may develop new behaviours and skills that help him or her participate in the meal routine.
c. Your quality of parent-child interactions may improve during mealtimes, and the parents’ knowledge and skills in supporting the child participant during mealtimes may be enhanced.

However, because behavioural and quality of life improvements cannot be assured, it is possible that the participating family not experience all of the benefits.

If you are interested in participating in the study, or learning more about the study, please contact me (Lauren Binnendyk) at (604) 721-3615 or Dr. Joe Lucyshyn at (604) 822-1904. My email address is lauren7@shaw.ca. Alternatively, you may also contact the agency representative who gave or sent to you this introductory letter. At that time, if you give the agency representative permission to release you name and phone number, I will contact you by telephone to answer any questions that you may have. In any event, thank you for your time and consideration.

Sincerely,

Lauren Binnendyk
Graduate Student (Doctorate)
Faculty of Education
University of British Columbia
CONSENT FORM: PARTICIPATION IN SCREENING PROCESS
Expanding the Unit of Analysis and Intervention for Children with Developmental Disabilities and Food Refusal Behaviour.

Principal Investigator: Joseph M. Lucyshyn, Ph.D.
Faculty of Education
University of British Columbia
2125 Main Mall
Vancouver, BC V6T 1Z4

Co-investigator: Lauren Binnendyk, Graduate Student (Doctorate)
3814 West 3rd Avenue
Vancouver, B.C. V6R 1M4

Dear Parent/Guardian:

The purpose of this form is to request consent for your, for your child with a disability, and for other family members’ (focus child’s brother or sister) participation in a screening process for a research study. The study will be conducted in the Faculty of Education of the University of British Columbia. Joseph Lucyshyn is the Principal Investigator. The co-investigator is Lauren Binnendyk of the University of British Columbia. The research study is for the fulfillment of degree requirements for the doctoral degree. I am inviting your family to participate in the screening process because a representative of a local social service agency has recommended your child and family’s participation. After reading the consent form, if you have any questions, I will be happy to answer them to ensure that the screening procedures are fully understood.

PURPOSE OF STUDY

The purpose of this study is to examine the acceptability, effectiveness, and sustainability of a comprehensive approach to behaviour support with families of children with developmental disabilities and food refusal behaviour. The approach is based on best practice in behavioural support with families. It emphasizes a collaborative process in which family members and the


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co-investigator work together in equal partnership to improve eating behaviour of the child with a disability, and overall family quality of life. The study will evaluate the extent to which behavioural feeding interventions:

1. Improve child behaviour and parent-child interaction in a family meal routine;
2. Promote your child’s successful participation in a meal routine;
3. Empower you and other family members to successfully support the child
4. Enhance the quality of life of your child and family.

SUMMARY OF FAMILY SUPPORT AND RESEARCH ACTIVITIES

Participation in the project will involve you and your family collaborating with the co-investigator in four family support activities and in four research activities. The four family support activities are:

1. Comprehensive assessment;
2. Development of a behaviour support plan;
3. Implementation support to help you implement the behaviour support plan;
4. Follow-up support for up to three months.

The four research activities are:

1. Preliminary assessments to define the meal routine and verify problem behaviour in a family meal routine
2. Videotaped observations in a family meal routine, under conditions that may produce problem behaviour, to confirm the purpose of problem behaviour
3. Videotaped observations in a family meal routine to measure child and family outcomes.
4. Assessment of overall family quality of life

Research and family support activities will occur over a six month period. During the first three months, your child and family will be involved in support or research activities approximately 2 to 4 hours per week. During the following three months of the study, your child and family’s involvement will decrease. This period of time is called follow-up. It will begin after your child with a disability has improved his or her eating and related mealtime behaviour in the targeted family meal routine. During follow-up (last three months of the study), research and support activities will occur 1-2 hours per month. Research and family support activities are described below:

CRITERIA FOR PARTICIPATION IN STUDY

Before a family can participate in the study, we first need to confirm that the child and family meet the criteria for participation. These criteria are: (a) the family is raising a young child (e.g., 3 to 8 years old) with a developmental disability; (b) the child consistently engages in severe food refusal behaviour (i.e., feeding problems have persisted for 15-50 months and the parent has virtually given up trying to get their child to eat new foods; (c) the child’s food
refusal behaviour is not the result of organic factors (e.g., physiological abnormalities, allergies); (d) the family does not view itself as in crisis due to the child’s problematic feeding behaviours or other family issues; (e) the family is willing to participate in the study for up to six months.

SCREENING PROCESS

We have developed a screening process to find out if your child and family are eligible to participate in the study. When you first contact us by telephone, we will review the criteria for participation, and answer any questions you may have. We will then decide together whether to proceed with the screening process. The specific steps in the process are described below.

1. **Preliminary interview.** We will first meet with you in your home or a place that is more convenient for you and conduct a preliminary interview. The interview is focused on understanding your child’s problem behaviours during home-based meal routines. The interview will take approximately one hour.

2. **Preliminary observations.** If the interview indicates that your child is a good fit for the study, then we will request permission to conduct observations in the home of the family meal routine. With your permission, I will observe you and your child during a family meal routine in which problem behaviours regularly occur. During the observation, I will use an observation form to gather data about child problem behaviours. A minimum of 2 to 3 observations will be conducted. Each observation will last between 3 and 15 minutes.

3. **Informed consent for study participation.** If the observations confirm the presence of durable problem behaviours in a family meal routine in the home, then we will invite you to participate in the study. At that time, we will ask you to read and sign an informed consent letter for participation.

POTENTIAL RISKS AND SAFEGUARDS

If you agree to participate and permit your child and family to participate in the screening process, you will need to consider four potential risks: (1) physical; (2) psychological; (3) legal; and (4) loss of confidentiality.

1) **Physical Risk.** Because the child participant engages in problem behaviour, there is more than a minimal risk that the child participant or other family members may experience physical injury during the study. Every precaution will be taken to minimize this risk:
   1. Members of the research team have extensive experience working with children who engage in problem behaviour in the home.
   2. Behaviour support strategies will focus on preventing behaviour problems and on teaching positive behaviour that are designed to replace problem behaviour.
   3. Observation sessions and training and support activities will be terminated if the child participant begins to engage in medium to high intensity problem behaviour.
4. As needed, the research team will be available to assist the family, the child and other family members during observation sessions, and during training and support activities.

2) **Psychological Risk.** Because the family will be observed during home-based eating/mealtime routines and will participate in training and support activities, the parents, child or other family members may experience psychological risk. That is, the parents, child or other family members may feel some discomfort or stress during these activities. Several steps will be taken to guard against this risk:

   1. During observation sessions the observer will maintain a low profile and not call attention to him or her self.
   2. Any person in the family can terminate an observation session at any time.
   3. ‘Family-friendly’ features of the family support process should help to reduce stress associated with the study.

3) **Legal Risk.** A potential but minimal risk relates to the legal requirements around reporting abuse if it is witnessed. If members of the research team witness any abuse of the focus person by any person, they will have to report it to the appropriate provincial authorities. This risk will be guarded against in the following ways:

   1. The study focuses on providing family members with positive, non-punitive ways to prevent and manage child problem behaviour. Family members who develop these skills are unlikely to engage in child maltreatment.
   2. If abuse is observed the parents will be informed and invited to participate in reporting the incident. The research team will then refer you to appropriate family support services or a community agency.

4) **Loss of Confidentiality.** There is a risk that the child participant or other family members may experience a loss of confidentiality. To guard against this risk we will:

   1. change names of all persons, places, and programs described in the study;
   2. allow access to information only to members of the research team;
   3. keep all data, notes, and videotapes in a locked file in a secure office; and
   4. data collected solely for the study will be destroyed 5 years after the study is completed.

**POTENTIAL BENEFITS**

By participating in the screening process, you and your child will experience one of two potential benefits. These are listed below.

Participation in family support research study. If the screening process indicates that your child is a good fit for the family support study, you will be invited to participate in the research study. There are three specific benefits of participation:
1. improvement in your child’s feeding behaviour and participation in the targeted routine;
2. The quality of parent-child interactions may improve during mealtimes, and the parents’ knowledge and skills in supporting the child participant during mealtimes may be enhanced; and
3. contributions to knowledge about how to durably and meaningfully improve child behaviour and parent-child relationships in a valued family meal routine.

However, because behavioural and quality of life improvements cannot be assured, it is possible that you and your family may not experience all of the benefits listed above.

1. **Assessment report and recommendations.** If the screening process does not indicate that your child is a good fit for the study, then we will provide you with two benefits:
   a. summary of the preliminary interview and/or observations;
   b. recommendations for behaviour support that are based on the interview and/or observations;
   c. and referral to appropriate, alternative sources for family and behavioural support in your community.

**ALTERNATIVES**

If during the screening process, you choose not to participate in the study, we will refer you to appropriate, alternative sources for family and behavioural support in your community.

**RIGHTS AS A RESEARCH PARTICIPANT**

Your participation and that of your child and other family members is voluntary. Your decision whether or not to participate and to allow your child and other family members to participate will not have any affect on your child’s education, the provision of support from a community agency, or future opportunities for behaviour consultation and support. If you agree to participate and allow your child and other family members to participate, you are free to withdraw consent and refuse to continue your participation and that of your child and family. You may do so at any time without penalty or loss of benefits to which you, your child, or other family members are otherwise entitled. By signing the consent form, you do not waive any of your legal rights. If you have any questions, please contact Dr. Joseph Lucyshyn at (604) 822-1904 or Lauren Binnendyk at (604) 721-3615. If you have any concerns about your rights or treatment as a research participant, you may contact the Research Subject Information Line in the UBC Office of Research Services at (604) 822-8598. Your signature below indicates that you have received a copy of this consent form for your records. Your signature indicates that you consent to your, your child with a disability and other family members (i.e., siblings) participation in the screening process.

Sincerely,
Lauren Binnendyk, M. A., Graduate Student (Doctorate)
Co-Investigator
Faculty of Education
University of British Columbia
CONSENT FORM FOR PARTICIPATION IN SCREENING PROCESS

Study Title: Expanding the Unit of Analysis and Intervention for Children with Developmental Disabilities and Food Refusal Behaviour.

Principal Investigator: Joseph Lucyshyn, Ph.D., Faculty of Education, University of British Columbia

Co-Investigator: Lauren Binnendyk, Doctoral Student, Faculty of Education, University of British Columbia

I have read and received a copy of this consent form and have had an opportunity to ask questions about the research project and the screening process. I have received an adequate description of the purpose, goals, and procedures of the screening process, and I consent to participate in the screening process. I understand that all information will be kept confidential, that my participation is voluntary, and that I may withdraw consent at any time and discontinue participation at any time without penalty or loss of benefits to which I am otherwise entitled, and that I am not waiving any legal claims, rights, or remedies. By signing below, I agree to participate in the screening process of the research study of parent-child interaction in family routines under the terms stated above.

___________ YES, I consent to participate in the screening process and give permission for my child with a disability and other family members (i.e., focus child’s brother and/or sister) to participate in the screening process.

___________ NO, I do not consent to participate in the screening process, and my child with a disability and other family members do not have my permission to participate in the screening process.

Focus Child’s Name: _______________________

Sibling’s Name: _______________________

Sibling’s Name: _______________________

Parent/Guardian Signature: _______________________
Date: __________

Parent/Guardian Signature: _______________________
Date: __________

Witness: _______________________
Date: __________

PLEASE RETURN THIS PAGE TO:
Lauren Binnendyk, Doctoral Student
3814 West 3rd Avenue
Vancouver, B.C. V6R 1M4
FOCUS CHILD ASSENT FORM: SCREENING PROCESS

Expanding the Unit of Analysis and Intervention for Children With Developmental Disabilities and Food Refusal Behaviour.

I have talked with your parents about a screening process. The screening process is the first step in a research project that you and your family might do with me. The purpose of the screening process is to find out if you and your family can participate in the research project. During the screening process, I will visit your home, talk with your parent(s), and observe you and your parents eating a meal together.

The information from these talks and observations will help us decide whether you and your family will participate in the research project. During an observation, if you want me to stop, you just have tell your parents or me to stop. Also, anytime you want to stop the screening process (that is, stop me from coming over a few times to observe), then just tell your parents and I will stop. After we finish the talks and observations, we will be able to decide what to do next. If we invite you and your family to participate in the research project, then we will visit you more often and observe more often. At that time, we will help you and your family learn to have meals together in the home. Also at that time, we would use a video camera to observe [show video camera and role play videotaping] how you and your family are doing during meals at home. If we are unable to invite you and your family to participate in the study, we will give your family a summary of the interview and observations. We also will give them suggestions about how to help you participate during family meals.

I am telling you what I will do, so that you can tell me whether you would like to participate in the screening process, or would prefer not to participate. If you choose to participate, then your parent(s) will sign their name below. Remember, you can change your mind and stop the screening process at any time.

Name of participant: ___________________________

__________ YES, I agree to participate in the screening process

__________ NO, I do not agree to participate in the screening process

Signed: ____________________________________ Date: _________

Witness: ____________________________________ Date: _________
BROTHER OR SISTER ASSENT FORM: SCREENING PROCESS

Improving Parent-Child Interaction in Valued Family Routines

We are interested in learning how to help your parents support (name of focus child) at during meals at home. We plan to do this by conducting a study. Before we can begin the study, we need to find out if _________ is eligible to participate in the study. We wish to do so by conducting a screening process with your family. We will interview your parents and observe _________ and you and your family having a meal together in the home.

We also would like to ask you to participate these meal routines in the home. If you agree to participate, we will ask you to do what you typically do during mealtimes; that is, listen to your parents and cooperatively do the routine. We will make sure that while you and your family are doing this meal routine together, everybody stays safe.

When we begin, a person will visit your home to observe you, _________, and your parents in during a family meal routine. We will observe once or twice to find out if _________ engages in problem behaviour during meal routines. When an observer is observing the meal routine and collecting data on problem behaviour, he or she will do his or her best to stay out of the way. Also, the screening data will only be shared with members of the research team.

If the screening process shows that _________ is a good fit for the study, then we will invite your family to participate in the study. During the study we will help your family create a happier life for _________ and your family. We will do so by helping your family successfully support _________ in a family meal routine in the home. If the screening process does not show _________ to be a good fit for the study, then we will give your parents a summary of the information that we gathered, and suggest to them some ways that they can support _________ ‘s participation in the meal routine that we observed.

While we are observing _________, you, and other family members, if you do not want to participate, just tell us. You won't get into any trouble. If you don't want to participate at all, you don't have to. Just say so. Also, if you have any questions about what you will be doing, or if you cannot decide, just ask us if there is anything you would like us to explain. If you want to try, please sign your name on the line below. Your parent(s) have already told us that it is alright with them if you want to participate in the screening process. Remember, you don't have to, and once you start you can rest or stop whenever you like.

Name of participant: ___________________________

_________ YES, I agree to participate

_________ NO, I do not agree to participate.

Signed: ___________________________ Date: __________

Witness: ___________________________ Date: __________
Dear Parent/Guardian:

The purpose of this form is to request consent for your, for your child with a developmental disability, and for your family members’ (i.e., focus child’s sibling) participation in the research study. The study will be conducted in the Faculty of Education of the University of British Columbia. Joe Lucyshyn is the Principal Investigator. The Co-Investigator is Lauren Binnendyk of the University of British Columbia. The research study is for the fulfillment of degree requirements for the doctoral degree. I am inviting your family’s participation because a representative of a local service agency has recommended your child and family’s participation. After reading the consent form, if you have any questions, I will be happy to answer them to ensure that the procedures are fully understood.

PURPOSE OF THE STUDY
The purpose of this study is to examine the acceptability, effectiveness, and sustainability of a comprehensive approach to behaviour support with families of children with developmental disabilities and food refusal behaviour. The approach is based on best practice in behavioural support with families. It emphasizes a collaborative process in which family members and the co-investigator work together in equal partnership to improve eating behaviour of the child with a disability, and overall family quality of life. The study will evaluate the extent to which behavioural feeding interventions:

1. improve child eating behaviour and parent-child interaction in a valued family meal routine such as lunch, snack, or dinner;
2. promote your child's successful participation in eating/mealtime routines;
3. empower you and other family members to successfully support the child;
4. enhance the quality of life of your child with a developmental disability and family.

**FAMILY SUPPORT AND RESEARCH ACTIVITIES**

Participation in the project will involve you and your family collaborating with the co-investigator in five family support activities and in two research activities. Research and family support activities will occur over a six month period. During the first 3 months your child and family will be involved in support and research activities for approximately 2-4 hours per week. During the last 3 months of the study, your family would be involved in support and research activities for approximately 1-2 hours a month. The five family support activities are described below.

*Preliminary Assessment* Preliminary assessment activities will involve two interviews with you and other family members at a time and place of your convenience. These interviews will last 1-2 hours. The purpose of the interviews is to identify a valued meal routine in the home and to develop a preliminary understanding about problematic feeding behaviour. Following the interviews, we will conduct two to three pilot observations in the identified routine. The purpose of these observations will be to verify the occurrence and purpose of problematic feeding behaviour. Each observation will last between 15 and 30 minutes.

*Comprehensive Assessment.* A comprehensive assessment is performed after the preliminary assessment is completed. First, a functional assessment interview will be completed. This will involve one meeting of 1-2 hours in length. We will then confirm the results of the functional assessment interview by conducting a series of observations of parent-child interaction in the identified meal routine in the home. The observations will occur during one session and will take approximately 1-2 hours to complete. This assessment will help us develop a thorough understanding of the why your child engages in food refusal behaviour. This also information will help us develop an effective behaviour support plan. Second, we will complete a family ecology assessment. This will involve one meeting of 1-2 hours in length in which we learn about your family’s strengths, supports, goals, and stressors. This information will help us develop a plan that is a good fit for your family.
Positive Behaviour Support Plan Design. Following assessment activities, we will collaborate with you to build a behaviour support plan for the problematic family meal routine. This will be done through a series of two meetings. Each meeting will last 1-2 hours. During a planning meeting, family members and the Co-Investigator will review assessment information and build a support plan that fits well with the routine. The plan will include several behaviour support strategies. It will be designed to improve child eating behaviour, parent-child interactions, and the success of the routine.

Training Support. Training and support to help you and your family members implement the support plan in the meal routine will occur approximately twice per week and involve 1-2 hours. During these meetings, the Co-Investigator will teach you and your family members how to implement support strategies with your child. Activities may include discussion of written instructions, role-play strategies, and coaching in the routine.

Follow-up Support. After you have succeeded in improving child eating behaviour in the selected meal routine, we will transition to a phase of research called follow-up support. The co-investigator will meet with your family once a month for three months to provide whatever support or retraining you may need.

The two research activities are described below.

Videotaped Observations Videotaped observations in one meal routine will occur during the experimental phases of the study. These phases are baseline, intervention, and follow-up. Observation sessions will NOT occur on the same day as a training session. During an observation session an observer will videotape your child and family’s participation in the selected meal routine. Each observation session will last up to 30 minutes. During baseline, observations will occur an average of once or twice per week over a period of three to four weeks. Approximately six or seven observations will be completed. During intervention, observation sessions will occur an average of once a week over a period of 8 weeks. Approximately 10 observations will be completed. During follow-up, observation sessions will occur once a month for three months.

Assessment of Family Functioning Another research activity that will take place is an assessment of your family’s well-being. This will occur at the beginning and end of the study. You will be asked to fill out four questionnaires about the overall quality of family life. Completing each questionnaire will take approximately 30 minutes.

POTENTIAL RISKS AND SAFEGUARDS

If you agree to participate and permit your child and family to participate, you will need to consider four potential risks: (1) physical; (2) psychological; (3) legal; (4) loss of confidentiality.

1. Physical Risk Because your child engages in food refusal behaviour, there is more than minimal risk that you, your child, or another family member may experience physical injury during the study. Every precaution will be taken to minimize risk:
a. Members of the research team have extensive experience working with children who engage in problem behaviour in the home.
b. Behaviour support strategies will focus on preventing behaviour problems and on teaching positive behaviours that are designed to replace problem behaviours.
c. Observation sessions and training and support activities will be terminated if your child begins to engage in medium or high intensity problem behaviour.
d. As needed, the research team will be available to assist you, your child, and other family members during observation sessions, and during training and support activities.

2. Psychological Risk

Because your family will be observed during a home mealtime routine and will participate in training and support activities, you, your child, and other family members may feel some discomfort or stress during activities. Several steps will be taken to guard against this risk:

a. During observation sessions, the observer will maintain a low profile and not call attention to him or her self.
b. You or other family members can terminate an observation session at any time.
c. ‘Family-friendly’ features of the support process should help to reduce stress associated with the study. Interviews will be conducted at a time and place that is convenient for you and your family. Support plans will be developed collaboratively with you and your family to ensure that plans fit well with your goals and routines.

3. Legal Risk

A potential but minimal risk relates to the legal requirements around reporting abuse if it is witnessed. If members of the research team witness any abuse of the focus person by any person, they will have to report it to the appropriate provincial authorities. This risk will be guarded against in the following ways:

a. The study focuses on providing family members with positive, non-punitive ways to prevent and manage child problem behaviour. Family members who develop these skills are unlikely to engage in child maltreatment.
b. If abuse is observed, you will be informed and invited to participate in reporting the incident. The research team will then refer you to appropriate family support services or a community agency.

4. Loss of Confidentiality

There is a risk that you, your child, or another family member may experience a loss of confidentiality. To guard against this risk we will:

a. change the names of all persons, places, and programs described in the study;
b. allow access to information only to members of the research team;
c. keep all data, notes, and videotapes in a locked file in a secure office; and
d. data collected solely for the study will be destroyed 5 years after the study is completed.

POTENTIAL BENEFITS

By participating in the study, you, your child with a disability and other family members may experience three direct benefits and one indirect benefit. These are listed below.
1. Your child’s problematic eating behaviours may decrease to near zero levels in the selected meal routine.
2. Your child also may develop new skills that help him or her participate in meal routines.
3. The quality of parent-child interaction may improve, and your knowledge and skills in supporting your child may be enhanced.
4. Through your participation, other families who have children with disabilities may also benefit. This will occur by describing project results in journals and at conferences.

However, because behavioural and quality of life improvements cannot be assured, it is possible that you and your family may not experience all of the benefits listed above.

ALTERNATIVES

If you choose not to participate in the study, we will refer you to appropriate, alternative sources of family and behavioural support in your community.

Your participation and that of your child and other family members is voluntary. Your decision whether or not to participate and to allow your child and other family members to participate will not have any affect on your child’s education, the provision of support from a community agency, or future opportunities for behaviour consultation and support. If you agree to participate and allow your child and other family members to participate, you are free to withdraw consent and refuse to continue your participation and that of your child and family. You may do so at any time without penalty or loss of benefits to which you, your child, or other family members are otherwise entitled. By signing the consent form, you do not waive any of your legal rights. If you have any questions, please contact Dr. Joseph Lucyshyn, (604) 822-1904 or Lauren Binnendyk (604) 721-3615. If you have any concerns about your rights or treatment as a research participant, you may contact the Research Subject Information Line in the UBC Office of Research Services at (604) 822-8598. Your signature below indicates that you have received a copy of this consent form for your records. Your signature indicates that you consent to your, your child with a disability and other family members (i.e., siblings) participation in the study.

Sincerely,
Lauren Binnendyk, M.A., Graduate Student (Doctorate).
Co-Investigator
Faculty of Education
University of British Columbia

Joe Lucyshyn, Ph.D.
Principal Investigator
Faculty of Education
University of British Columbia
CONSENT FORM FOR PARTICIPATION IN STUDY

Study Title: Expanding the Unit of Analysis and Intervention for Children with Developmental Disabilities and Food Refusal Behaviour.

Principal Investigator: Joseph Lucyshyn, Ph.D., Faculty of Education, University of British Columbia

Co-Investigator: Lauren Binnendyk, Doctoral Student, Faculty of Education, University of British Columbia

Consent: I have read and understood the attached letter of request to participate in the study entitled, “Expanding the unit of analysis and intervention for children with developmental disabilities and food refusal behaviour.” I also consent to and authorize the release of information from biographical records to document birth date, most recent IQ score and test, diagnostic information, and medical records. I understand that all information will be kept confidential and that my participation and that of my child and other family members (i.e., focus child’s brother and/or sister) is entirely voluntary and that I, my child, or other family members may withdraw consent and refuse to participate at any time without any penalty or loss of benefits to which my family is otherwise entitled, and that I am not waiving any legal claims, rights, or remedies. I also understand that I will receive a copy of this letter of request for consent for my own records. My decision regarding my participation, that of my child with a disability, and that of other family members is indicated below.

___________ YES, I consent to participate and give permission for my child with a disability and other family members (i.e., focus child’s brother and/or sister) to participate.

___________ NO, I do not consent to participate, and my child with a disability and other family members do not have my permission to participate.

Focus Child’s Name:_______________________

Sibling’s Name:_______________________

Sibling’s Name:_______________________

Parent/Guardian Signature:______________________________ Date:______________

Parent/Guardian Signature:______________________________ Date:______________

Witness:_______________________________________ Date:______________

PLEASE RETURN THIS PAGE TO:
Lauren Binnendyk, Doctoral Student
3814 West 3rd Avenue
Vancouver, B.C. V6R 1M4
FOCUS CHILD INFORMED ASSENT FOR PARTICIPATION IN STUDY
Expanding the Unit of Analysis and Intervention for Children With Developmental Disabilities and Food Refusal Behaviour.

We are interested in learning how to support you and your family while eating a meal together at home. We know that sometimes it's hard for you to sit at the table and eat new foods without getting upset. We would like to help you with this. We would do this by teaching your parents ways to help you stay calm and happy during mealtimes in the home. We may also spend some time teaching you ways to get what you want using words or pictures instead of problem behaviour. The things that you and your parents will learn will be pretty positive. We will make sure that while you are working with us you are safe. We will do our best to make life more enjoyable for you and your family. When we begin, a person will visit your home to videotape you, your parents and your brother(s) and/or sister(s) having a meal together. The person will videotape about once a week at the beginning of our work together. Later, he or she will videotape you and your family once or twice a month. He or she will do his or her best to stay out of the way. Later, we will look at the videotapes and learn if our help is working or not. We will make sure that only those people who need to see the videotape have a chance to see it. We would like to help your family for a pretty long time – up to six months.

By allowing us to support you and your family, we believe we can help you and your family have a happier meal together at home. Also, you will help us learn better ways to support other families. While we are helping you and your parents, if you want us to leave just tell us. You won't get into any trouble! In fact, if you don't want us to spend time with your family at all, you don't have to. Just say so. Also, if you have any questions about what you will be doing, or if you cannot decide whether to do it or not, just ask us if there is anything you would like us to explain. If you want to try, please sign your name on the line below. Your parent(s) have already told us that it is alright with them if you want to work with us. Remember, you don't have to, and once you start you can rest or stop whenever you like.

Name of participant: ___________________________

_____________ YES, I agree to participate in the screening process

_____________ NO, I do not agree to participate in the screening process

Signed: _________________________________ Date: __________

Witness: _________________________________ Date: __________
BROTHER OR SISTER ASSENT FORM FOR PARTICIPATION IN THE STUDY

Expanding the unit of analysis and intervention for children with developmental disabilities and food refusal behaviour.

We are interested in learning how to help your parents support (name of focus child) at home during mealtimes. We plan to do this by conducting a study. We know that sometimes it’s hard for _________ to sit at the table and eat new foods without getting upset. We would like to help him/her and your family with this. We would do this by teaching your parents ways to help _________ stay calm and happy during family meals in the home. We may also spend some time teaching _________ ways to get what he/she wants by using words or pictures instead of problem behaviour. The things that _________ and your parents will learn will be pretty positive.

We also would like to ask you to participate in this meal routine in the home. If you agree to participate, we will ask you to do what you typically do during these routines; that is, listen to your parents and cooperatively do the routine. We will make sure that while you and your family are working with us, you and your family are safe. We will do our best to make _________’s life more enjoyable for him or her. By doing so, we also hope to make your life and that of your family’s more enjoyable.

When we begin, a person will visit your home to videotape you, _________, and your parents in a meal routine. The person will videotape about once a week at the beginning of our work together. Later, he or she will videotape you, _________, and your parents once or twice a month. He or she will do his or her best to stay out of the way. Later, we will look at the videotapes and learn if our help is working or not. We will make sure that only those people who need to see the videotapes have a chance to see them. We would like to help your family for approximately six months.

By agreeing to participate, we believe we can help your family make a happier life for _________ and also for your family. Your participation also will help us learn better ways to support other families. While we are helping your family or while a person is videotaping, if you do not want to participate, just tell us. You won't get into any trouble. If you don't want to participate at all, you don't have to. Just say so. Also, if you have any questions about what you will be doing, or if you cannot decide, just ask us if there is anything you would like us to explain. If you want to try, please sign your name on the line below. Your parent(s) have already told us that it is alright with them if you want to participate. Remember, you don't have to, and once you start you can rest or stop whenever you like.

Name of participant: ___________________________

_______ YES, I agree to participate

_______ NO, I do not agree to participate.

Signed: ___________________________ Date: __________

Witness: ___________________________ Date: __________
VIDEOTAPING CONSENT FORM

Study Title: Expanding the Unit of Analysis and Intervention for Children with Developmental Disabilities and Food Refusal Behaviour.

Principal Investigator: Joseph M. Lucyshyn, Ph.D.

Co-investigator: Lauren Binnendyk, Doctoral Student

Consent: I understand that my participation in this study will involve videotaping of me, my child with a disability, and other family members in our home. I also understand that I may request that the researchers stop the videotaping at any time if I, or a member of my family does not want to be videotaped. I also understand that all videotaped materials will be kept in a secure and locked location, and that only the researchers will have access to this material, unless I give my specific permission for it to be viewed by any other person.

My consent regarding the videotaping of my child’s participation and that of my family in this study is indicated below. I understand that I will receive a copy of this consent for my personal records.

______, Yes, I consent to the videotaping of my child and family.

______, No, I do not consent to the videotaping of my child and family.

Focus Child’s Name: _______________________

Sibling’s Name: _______________________

Sibling’s Name: _______________________

Parent Signature: _______________________

Date: ______

Parent Signature: _______________________

Date: ______

Witness: _______________________

Date: ______

If I have questions or concerns about videotaping of my child or family, I may contact:

Joseph Lucyshyn OR Lauren Binnendyk
Faculty of Education 3814 West 3rd Avenue
University of British Columbia Vancouver, B.C.
2125 Main Mall (604) 721-3615
Vancouver, B.C. V6T 1Z4 lauren7@shaw.ca
(604) 822-1904
joe.lucyshyn@ubc.ca
APPENDIX D

Social Validity Evaluation

Family: _______________________

Date: _________________________

Family member completing evaluation: __________________

The purpose of this questionnaire is to obtain information that will aid in: a) the selection and improvement of behavioural support strategies implemented in the home by family members; and b) the improvement of our process for providing families with behavioural consultation and support. Please circle the number that best describes your agreement or disagreement with each statement (1 = disagree, 5 = agree). You also have space to write comments or suggestions for change or improvement.

<table>
<thead>
<tr>
<th>Disagree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The goals of the behavioural support plan are appropriate for my child.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Comments:</td>
<td></td>
</tr>
</tbody>
</table>

| 2. The goals of the plan are consistent with my family's goals, values, and beliefs. | 1 2 3 4 5 |
| Comments: |

| 3. The strategies and procedures used are difficult to carry out in the home. | 1 2 3 4 5 |
| Comments: |

| 4. The strategies and procedures used are effective in improving my child's behaviour. | 1 2 3 4 5 |
| Comments: |

| 5. The outcomes of the support effort are beneficial for my child. | 1 2 3 4 5 |
| Comments: |
|   | The outcomes of the support effort are beneficial to my family as a whole. | Disagree | Agree |
|---|---|---|---|---|---|
| 6. | 1 | 2 | 3 | 4 | 5 |
| Comments: | | | | | |

|   | The support effort has caused some unanticipated problems in our family. | Disagree | Agree |
|---|---|---|---|---|---|
| 7. | 1 | 2 | 3 | 4 | 5 |
| Comments: | | | | | |

|   | Training activities have been well organized, clear, and helpful. | Disagree | Agree |
|---|---|---|---|---|---|
| 8. | 1 | 2 | 3 | 4 | 5 |
| Comments: | | | | | |

|   | The person(s) providing technical assistance has shown respect for our family's values and beliefs. | Disagree | Agree |
|---|---|---|---|---|---|
| 9. | 1 | 2 | 3 | 4 | 5 |
| Comments: | | | | | |

|   | Overall, this behavioral support effort has strengthened our family. | Disagree | Agree |
|---|---|---|---|---|---|
| 10. | 1 | 2 | 3 | 4 | 5 |
| Comments: | | | | | |
APPENDIX E

Goodness of Fit Survey for Behavior Support Plans Used by Families

Name of Family:
Family Member(s) completing checklist:
Date:
Focus Routine:

Introduction: Research and practical experience show that the success of a support plan depends a great deal on whether the plan “fits” with the values and lifestyle of the family. The purpose of this survey is to understand the extent to which you believe the support plan developed for your son/daughter is a good fit for your family. Your responses will help us (a) improve the quality of the plan and (b) understand better how to build support plans that are most helpful. For the routine identified, please rate each question on a scale of one (1 – not at all) to five (5 – very well/much).

<table>
<thead>
<tr>
<th>Questions</th>
<th>Not at All</th>
<th>Not Much</th>
<th>Can’t Tell</th>
<th>Well/ (Much)</th>
<th>Very Well/ Very Much</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Do you believe the research team understands your child’s needs in this routine?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. Do you believe the plan is based on an understanding of the reasons for problem behavior (i.e., escape or attention)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3. Does the plan really address your highest priority goals for your child and family in this routine?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4. Do you understand what you are expected to do as part of this plan?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5. Do you understand what is expected of other family members?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6. Are you comfortable with what you and others are expected to do?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7. Does the plan recognize and support your needs as a mother or father?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8. Does the plan recognize and support the needs of other family members living in the home (e.g., siblings)?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9. Overall, how well does the support plan fit with your family’s needs within this routine?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>10. Overall, how well does the plan fit with your values and beliefs about raising your child with a disability and creating a meaningful family life together?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>11. To what extent does the plan build off of successful strategies you were using?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>12. Will the plan, in the long run, disrupt family routines in the home to a point that stress and hardship will be creating?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Questions</td>
<td>Not at All</td>
<td>Not Much</td>
<td>Can’t Tell</td>
<td>Well/ (Much)</td>
<td>Very Well/ Very Much</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------</td>
<td>------------</td>
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<td>----------------------</td>
</tr>
<tr>
<td>13. Does the plan recognize and build on you child’s and your family’s strengths?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>14. Does the plan make use of resources (e.g., help from your spouse, respite care, etc.) available to you and your family?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>15. To what extent would you like to see the use of available resources incorporated to a greater extent in your plan?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>16. All things considered, how difficult will it be or is it for you to use this support plan (e.g., time involved, coordination of tasks, etc.)?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>17. To what extent do you believe the support plan will be or is effective?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>18. Do you believe you can keep using the support strategies for a long time (e.g., over one year) even if there is reduced contact with members of the research team?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Comments:
APPENDIX F

Family Ecology Assessment

1. What would you characterize as strengths of your family?

2. What are sources of stress in your family?
   a. What is the effect of your child’s problem behaviours on you as a parent?
   b. What is the effect of your child’s problem behaviours on the family as a whole?
   c. What are other sources of stress in the family?

3. What formal or informal resources have you used to help improve the situation (e.g., respite care, participation in a parent support group, help with childcare and household chores by other family members)?

4. What are your sources of social support (i.e., someone with whom you discuss problems and find solutions; someone with whom you do leisure activities; someone who validates your worth as a person)?

5. What are your goals for your child and family?
APPENDIX G

Dinner Routine
December, 2007

Family Vision of a Successful Dinner Routine
Luke will participate in dinner routine with other family members (mom, dad, brother) in kitchen. The routine will begin approximately at 5:30 p.m. and up to 20 – 25 minutes. Son’s tasks are to come to the table and sit in his chair, eat entire meal using a fork or spoon, drink water/juice from a cup, use a napkin with support, converse with family, ask to leave when finished or ask for more if still hungry. Child and family-centered goals for this routine include, eating nutritious foods from all four major food groups and strengthening family unity by eating dinner together as a family.

Functional Assessment Summary
The insights gained from the F.A. are summarized below.

Behaviours of Concern: food refusal, scream, yell, physical aggression, throw food or meal related items, run away from table, physically resist

Contextual Events that Set the Stage for Problem Behaviour. There are several contextual events that increase the likelihood that Luke will engage in problem behaviour during the dinner routine: (a) tired at the end of the day due to seizure disorder and/or low tone; (b) difficulties with chewing due low tone; and (c) long history of food refusal behaviours.

Immediate Triggers for Problem Behaviour. The trigger for problem behaviour during dinner is a request to accept and swallow non-preferred foods.

Consequences that Inadvertently Reinforce Problem Behaviour: Research shows that children with developmental disabilities engage in problem behaviour because it helps them achieve what they want or avoid what they don’t want. Luke has learned that problem behaviour at dinner helps him to escape/avoid the request to eat non-preferred foods and get a preferred food/drink (e.g., milk). Specifically, when Luke engages in problem behaviour, the request to eat the food is withdrawn. The plate of food is taken away and Luke is permitted to leave the table or is given a bottle of milk. Although these are all natural things to do in response to Luke’s problem behaviours, it makes it more likely that he will engage in problem behaviour to escape the demands of eating new, non-preferred foods.
Behaviour Support Strategies

Strategies that Set the Stage for Success

Establish an instructional universe of foods: To promote generalization of Luke’s eating, choose three foods from each of the four major food groups (e.g., fruits, vegetables, meats/meat alternatives, grains). Foods targeted for intervention include the following: (a) carrots; (b) red pepper; (c) celery; (d) grapes; (e) apple; (f) banana; (g) tortellini; (h) lasagna; (i) rice; (j) meatballs; (k) chicken; and (l) ham.

Increase Luke’s motivation to accept new, non-preferred foods: Luke is likely to be more motivated to eat non-preferred foods if the following conditions are present. First, 2-3 hours prior to dinner or a feeding session, Luke is not allowed any food, milk, or juice. Second, Luke’s access to highly preferred toys and/or food reinforcers is limited to ONLY the feeding sessions/dinner routine.

Begin feeding intervention earlier in the day: If Luke is tired he is less likely to be cooperative with sitting at the table and trying new foods. As a result, it is recommended that intervention start earlier in the day and as Luke becomes more successful with eating new foods, introduce the foods during the dinner hour.

For foods that are more difficult to chew cut food up into small pieces: The occupational therapist has recommended that due to Luke’s low tone he is likely to tire easily when eating foods that are difficult to chew. To prevent this from occurring it is recommended that Luke’s food be served in smaller portions, and foods that are more difficult to chew cut up into bite sized pieces. Also to ensure Luke is well supported during meals, have Luke sit in his Trip Trap® chair while eating at the dinner table.

Initiate new foods with interventionist: To address Luke’s long history of food refusal, non-preferred foods are introduced with the interventionist during feeding sessions. Feeding sessions take place at the kitchen table. To begin, no family members will be present. Once Luke is eating age-appropriate portions of 5-6 non-preferred foods, implementation of the support procedures are transferred to the parent in the natural dinner routine.

Use visual supports to increase predictability and motivation with eating new foods: Three types of visual supports can be used to provide Luke with the information he needs to be successful during feeding interventions/dinner routine. The visual supports include: (a) social story; and (b) visual contingency.

Social story. Past experience has shown that the best way to communicate new information to Luke is through a social story. The social story developed for the dinner routine describes the sequence of expectations with trying new foods (i.e., touch, smell, put to lips, taste, eat a pea-sized amount), the importance of eating new foods, and what he can do if he is feeling anxious or uncomfortable. Also included in the story are short video vignettes from baseline.
observations in which Luke ate a few bites of dinner while sitting with his family. The social story is introduced to Luke a few days prior to starting the feeding intervention.

Visual contingency Luke maybe happier and more motivated to try new things if he understands what is expected of him and what he will get as a reinforcer for meeting those expectations. A visual contingency provides him with such information. The contingency differs depending on how successful Luke is at eating the new foods. For example, if Luke is just learning to eat a new food and is required to eat four bites, four pictures of the new food will be placed on the picture schedule, each picture representing one bite of food. Alternatively, if Luke is able to eat a nutritionally appropriate portion of food, one picture symbol of that food will be placed on the schedule, with that one picture symbol representing the whole plate/dish of food. At the end of the strip, show Luke using pictures, what he will earn for meeting the expectations of the routine, that is, eating all of his food (e.g., computer, game, playground). After each bite of food is consumed, remove a picture symbol from the plastic strip and count how many bites of food are left. After each food is consumed, removed the picture symbol representing that food and show Luke how many foods are left before he gets his preferred activity.

Increase positive events at the dinner table To increase Luke’s motivation to come to the table and stay for dinner it is helpful to increase the number of positive events and interactions he experiences during dinner. Based on Luke’s learning style and observations of the dinner routine, he is likely to be more cooperative when he is asked to help with a dinner related task (e.g., “can you scoop out the food?”), when food is paired with a preferred dip or condiment (e.g., Ketchup, salad dressing), when conversations are fun and humorous, and when novel reinforcers are available for Luke to earn.

Strategies that Prevent Problem Behaviour

Stimulus fading of TYPE of food: To teach Luke to eat non-preferred foods a hierarchy of foods are introduced to Luke beginning with highly preferred foods (i.e., foods he willingly accepts at preschool) and progressing to the most preferred of the non-preferred foods and finally the least preferred of the non-preferred foods. The adult begins the feeding intervention with preferred foods (e.g., cream cheese on bread, yoghurt). Beginning the intervention with highly preferred foods is likely to teach Luke the expectations of the routine (e.g., use of picture symbols, desired behaviour) and create momentum for more difficult foods. If the percentage of trials of acceptance for preferred foods (i.e., Luke accepts and swallows the preferred food within 30 seconds of presentation) is 80% or above for two-three consecutive sessions, the adult introduces a non-preferred food, beginning with the most preferred of the non-preferred foods (meat balls). If the percentage of trials of acceptance is above 80% for two to three consecutive sessions, a new food in the hierarchy of non-preferred foods will be introduced (e.g., another vegetable or meat). This stimulus fading procedure continues until Luke is accepting all foods targeted for intervention.

NOTE: When teaching Luke to eat new, non-preferred foods, gradually increase expectations for trying new foods. Specifically, when presenting a new food to Luke for the first time, provide Luke with a preferred food (e.g., chocolate) and praise contingent on him touching and smelling the food. Once Luke is successful with this level of expectation (i.e., no resistance),
up the ante by providing Luke with a reinforcer contingent on him licking or “nibbling the food”. Once Luke is successful, up the ante even further by delivering reinforcement contingent on Luke eating small pea-sized amounts.

**Stimulus fading of AMOUNT of food:** When teaching Luke to eat non-preferred foods, present pea-sized amounts on the spoon/fork. If the percentage of trials is above 80% (i.e., Luke accepts and swallows the food within 30 seconds of presentation) for 2-3 consecutive sessions increase the portion size by a specified amount (¼ of a spoonful, ½ of a spoonful, ¾ of a spoonful). This step continues until Luke is consuming a portion size that is nutritionally appropriate for his age (e.g., full child size, spoonful of food).

**Offer choices:** Luke is more likely to be successful if he feels that he has some control over the feeding intervention/dinner routine. Choice making is an effective way to give kids more control. Choices may vary from the number bites of the non-preferred food, the size of bite, the order in which he eats the food, or the reward at the end of the feeding session/meal (e.g., dessert, or fun activity).

**Use positive contingency statements** The use of natural positive contingencies is an important way that parents help their children learn to do new or difficult things. During the dinner routine, natural positive contingencies can be used to motivate Luke to come to the table and eat his dinner. Positive contingencies always include the following message, “Do [something that I want you to do] and then you will get [something that you like or want to do].” Examples include, “come to the table and see what surprise is waiting for you”; “take another bite and then I will read the question to you.”

**Strategies that Teach the Child New Skills**

**Teach Luke to ask for a break.** If Luke learns to ask for a break, he may be less prone to use problem behaviour to avoid or escape a demand to eat non-preferred food. When Luke is reliably using language instead of problem behaviour to assert his wants or needs, use a safety signal to build endurance (e.g., “Eat three more bites, and then you can take a break”).

**Consequences that Strengthen New Skills/Behaviours**

**Offer praise and preferred food** contingent on Luke coming to the table when requested, staying seated at the table, using his utensils, and eating new (non-preferred) food.

**Offer preferred activity** contingent on Luke consuming a specified number of bites of food or completing his meal.

**Consequences that Ensure Problem Behaviour is Not Rewarded**

If Luke engages in problem behaviour during the transition to the dinner table:

a) Actively ignore all behaviours
b) Give Luke a warning. E.g., “come to the table now or there will be no surprise”
c) Count to five to allow Luke an opportunity to get it together and make is way to the table.
d) After the warning, if Luke continues to engage in problem behaviour, ignore his behaviour and walk to the table.
e) If Luke does not follow, remove the “surprise” from the table.
f) Then, go and physically guide Luke to the table and prompt him to get started with eating some of his easy (i.e., preferred) foods.

If Luke engages in minor problem behaviours during the dinner routine, actively ignore and positively redirect or prompt language. Minor problem behaviour includes non-compliance or verbal defiance, and silliness. When minor behaviour occurs, do not call attention to the problem behaviour. Simply tell Luke what you want him to do and then prompt him to do so or prompt him to ask for a break.

If Luke engages in major food refusal behaviours during the dinner routine, use escape extinction procedure. Major food refusal behaviour includes, spitting, crying, screaming, throwing items/food, turning around in chair, hitting. If Luke escalates to this level of problem behaviour, use an escape extinction procedure. An escape extinction procedure includes the following steps:
   a) Ignore any problem behaviour. Do not comment or give any disapproving looks
   b) Hold the food up towards Luke and continue to present the demand to eat every 30 seconds. You can also remind Luke at this time what he will earn once he starts eating
   c) If Luke turns around in his chair, physically prompt him to sit forward facing the table. Then, stand behind him and continue to hold the food close to his mouth.
   d) If Luke tries to leave the table, block him from doing so
   e) Once Luke accepts the food, praise him for eating and sit back down
   f) If after 120 minutes Luke is still refusing to try new foods, end the session in a neutral way, do not provide him with his reinforcer, simply tell him he can try again tomorrow.

REVISIONS TO THE PLAN (MAY, 2008)
After several months of implementing the escape extinction procedure described above, Luke’s mother reported difficulty with keeping Luke in his chair if he was engaging in problem behaviour. The interventionist in collaboration with the mother revised the plan to make it more feasible for the mother. See below.

If Luke engages in minor food refusal behaviour do the following: Minor problem behaviours include the following: (e.g., minor protests, whining, covering mouth, turning head away)
   a) Ignore all behaviours. Do not comment or give any disapproving looks.
   b) Continue to present the bite of food and every 30 seconds request that Luke take a bite.
   c) If minor behaviours continue, continue to present the demand and/or prompt Luke to take a break.

If major food refusal behaviours occurred (e.g., spitting out food, turning head away, throwing food, screaming, leaving the table etc): When Luke engages in major
food refusal behaviours, remain calm and implement the three strikes rule. The three strikes procedure involves providing Luke with three warnings that if he doesn’t start eating he will lose a preferred item. The warnings are shown to Luke by drawing three boxes on a piece of paper and marking an × in each box after a warning is delivered. See below the steps involved with implementing the three strikes procedure:

a) Say gently to Luke, “If you don’t start eating I will have to put a strike here”;
b) Then count to five. If after five seconds Luke has not started eating, mark a strike.
c) Repeat steps a & b until Luke complies or receives 3 strikes
d) If Luke complies, then praise him and remind him that he will earn the reward
e) If Luke receives 3 strikes, sympathetically let him know that he did not earn the reward
f) Also, remind Luke that he still needs to eat his food (minimum three bites)
g) Then, actively ignore all protests and calmly redirect Luke back to eating. If after 60 minutes Luke still does not eat his food, calmly let him leave the table.

Evaluation

Use an implementation checklist on a daily basis at first, and later on a weekly basis, to evaluate: (a) plan implementation; (b) level of problem behaviour; and (c) social validity (the importance and acceptability of the plan’s goals, procedures, and outcomes).

Contextual Fit Considerations

Teach Luke’s Older Brother to Use a Self-management System During the Dinner Routine: Teach John (pseudonym) a self-management system that teaches him to identify desired behaviours during dinner, self-record when he is engaging in desired behaviours, and self-recruit adult attention and reward. The self-management system consists of a visual chart. The left column is a list of desired behaviours: (a) I come to the table when called; (b) I stay seated for the entire dinner; (c) I ate all my food; (d) I listened to my mom or dad; (e) I ignore Luke when he did something I didn’t like. The right column is where John records whether or not he is doing such behaviours. Before dinner, review with John desired behaviours you would like to see from John while having dinner with his family. During dinner, John monitors whether he met the expectation and if so, gives himself the assigned number of points. John then counts up his points and put the total at the end of the chart. John then shows him mom or dad and gets feedback as to whether he completed the self-management chart accurately (i.e., deserved the points he awarded himself). If so, John is awarded bonus points for his honesty. Once John has earned a specified number of points he can cash them in for reward that he chooses from his reward menu.

Schedule One Meal a Week With Father Present: To include the father in the support process, try and schedule one training session a week when father can be home early from work.

Enlist Support From Early Intervention Team to Provide Parents with Behaviour Support at Other Times of Day: In addition to the dinner routine, Luke engages in problem behaviour at other times of day. Additional support from the early intervention team is
recommended to teach the parents strategies for addressing Luke’s problem behaviours outside the meal routine.
# IMPLEMENTATION CHECKLIST

Luke  
Dinner Routine

Date: ________________________________

<table>
<thead>
<tr>
<th>Strategies to Set the Stage for Success</th>
<th>Not in Place</th>
<th>Partially in Place</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. To ensure L. was motivated to eat new foods I did the following:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) I did not give L. food or drinks (except for water) 2-3 hours before a feeding session/dinner.</td>
<td>1 2 3 4 5 NA</td>
<td></td>
</tr>
<tr>
<td>b) I limited Luke’s access to reinforcers (e.g., no big computer until after dinner, chocolate only at dinner)</td>
<td>1 2 3 4 5 NA</td>
<td></td>
</tr>
<tr>
<td>c) I rotated the reinforcers often</td>
<td>1 2 3 4 5 NA</td>
<td></td>
</tr>
<tr>
<td>d) I had Luke help prepare the meal</td>
<td>1 2 3 4 5 NA</td>
<td></td>
</tr>
<tr>
<td><strong>2. To increase predictability around mealtimes, I let Luke know in advance what would be happening after his session with his interventionist.</strong></td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Strategies to Support a Successful Transition To the Dinner Table</th>
<th>Not in Place</th>
<th>Partially in Place</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>3. I gave Luke a 5 minute then 2 minute warning that dinner was about to start.</strong></td>
<td>1 2 3 4 5 NA</td>
<td></td>
</tr>
<tr>
<td><strong>4. I used positive contingency statements (e.g., come to the table and see what’s waiting for you; come to the table and choose a fun activity for after dinner).</strong></td>
<td>1 2 3 4 5 NA</td>
<td></td>
</tr>
<tr>
<td><strong>5. I requested Luke’s assistance (e.g., help me call everyone to the table; help me serve the food; help me get the ketchup for your meatballs)</strong></td>
<td>1 2 3 4 5 NA</td>
<td></td>
</tr>
<tr>
<td><strong>6. I gave praise and preferred food contingent on Luke showing improvement with coming to the table and sitting down.</strong></td>
<td>1 2 3 4 5 NA</td>
<td></td>
</tr>
<tr>
<td><strong>7. If Luke engaged in problem behaviour during the transition, I ignored all behaviours and physically guided him to the table.</strong></td>
<td>1 2 3 4 5 NA</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Strategies to Support a Successful Dinner Routine</th>
<th>Not in Place</th>
<th>Partially in Place</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>8. I showed L. with a visual contingency</strong></td>
<td>1 2 3 4 5 NA</td>
<td></td>
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</tbody>
</table>
what is expected of him and what he will get once he meets those expectations.

<p>| | | | | | |</p>
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</thead>
<tbody>
<tr>
<td>9. I offered L. choices (e.g., type of new food; number of bites, size of bites; type of food reinforcer; fork or spoon)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>10. I increased the number of positive events at the table. Examples include: (a) humour; (b) condiments; (c) requesting L.’s assistance with serving the food.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>11. For new foods I gradually increased the amount L. was expected to eat starting with pea-sized amounts and increasing to age-appropriate foods.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>12. I used positive contingency statements to motivate L. to eat new foods. E.g., “one more bite and then you some chocolate”; “10 more bites and then we can play ___”).</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>13. I taught L. to ask for a break. I reminded L. before dinner that if he needed a break to just ask.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>14. I offered praise and a bite of preferred food/drink contingent on L. meeting the desired expectation.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>15. I offered L. a preferred activity contingent on him consuming a specified number of bites or completing his meal.</td>
<td>1</td>
<td>2</td>
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<td>4</td>
<td>5</td>
</tr>
<tr>
<td>16. If L. asked for a break, or help, I honoured his request by giving him a short, timed break.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
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<tr>
<td>17. If minor problem behaviours occur (e.g., “I’m angry, I’m not feeling very well”) I actively ignored and redirected L. to take a bite and or did one of the following: (1) prompted him to ask for a break; or (2) prompted him to take some deep breaths.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>18. If major problem behaviours occurred (e.g., spitting out food, turning head away, throwing food, screaming etc.) I did the following:</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>a) I ignored all behaviours, I did not comment or give any disapproving looks.</td>
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<td>2</td>
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<td>4</td>
<td>5</td>
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<tr>
<td>b) I continued to present the bite of food and every 30 seconds requested Luke take a bite</td>
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<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
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<tr>
<td>c) If Luke turned around in his chair, I stood up behind Luke and continued to present the food</td>
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<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
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</tbody>
</table>
d) Once Luke accepted the food I praised compliance.

<table>
<thead>
<tr>
<th>Problem Behaviours</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Food Refusal (turning head away, covering mouth, saying no, disgusting etc.)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>or more</td>
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<tr>
<td>2) Spitting or Spitting out Food</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>or more</td>
</tr>
<tr>
<td>3) Leaving Table</td>
<td>1</td>
<td>2</td>
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<td>4</td>
<td>5</td>
<td>or more</td>
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<tr>
<td>4) Throwing items/knocking things over</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>or more</td>
</tr>
<tr>
<td>5) Screaming</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>or more</td>
</tr>
<tr>
<td>6) Silly Behaviours</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>or more</td>
</tr>
<tr>
<td>7) Physical Aggression</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>or more</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Social Validity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disagree</td>
</tr>
<tr>
<td>1. The goals of the dinner routine are acceptable and important</td>
</tr>
<tr>
<td>2. The strategies are useful and effective.</td>
</tr>
<tr>
<td>3. The strategies are difficult to use.</td>
</tr>
<tr>
<td>4. Luke is successful during dinner.</td>
</tr>
</tbody>
</table>

Time it took to finish the meal: _____________________________________________

Food served: ___________________________________________________________________

Treats/Preferred Activities Used: ______________________________________________
Implementation Plan

Training Materials
1. Binder, paper, felt pens, stickers, data sheets (Lauren)
2. Visual Contingency (developed by Lauren)
3. Gather preferred items and foods for intervention (Mom)

1. Set up structured feeding sessions outside the natural meal routine
   a. Different time of day (lunch time)
   b. Interventionist implement the behaviour support strategies
   d. Collect data/Monitor progress

2. Interventionist introduces preferred foods and progresses to more difficult foods using the hierarchy of non-preferred foods developed by the parents. The interventionist teaches Luke to eat 5 non-preferred foods.

3. Once Luke reaches criteria for 3-4 foods, the interventionist transfers implementation of the support procedures to the natural setting (in the kitchen at the big table). The interventionist teaches Luke to eat the remaining foods in the natural setting.

4. Once Luke reaches criteria for 5 non-preferred foods the interventionist systematically transfers stimulus control to mom during the dinner routine. There are four steps to transferring stimulus control to the parent:
   a) parent observes the interventionist modeling the behavioural feeding strategies and is prompted by the interventionist to praise their child for acceptance of food;
   b) parent practices/role plays the feeding procedures with the interventionist outside the feeding session;
   c) parent feeds the child while the interventionist provides coaching, feedback, and positive reinforcement;
   d) parent feeds the child with the interventionist nearby but not in view.
Robbie’s Behaviour support Plan
Dinner Routine
April, 2008

Family Vision of a Successful Dinner Routine
Robbie will participate in dinner routine with parents in family room. The routine will begin approximately at 6:45 p.m. and last a minimum of 15 minutes. Robbie’s tasks are to stop what he is doing, go wash his hands, take his cup to the table and sit down, eat most of his dinner, stay seated for entire meal, use utensils, drink from a cup, converse with parents, and when finished take his plate and put it in the sink. Child and family-centered goals for this routine include, expanding diet to include vegetables and meat, not requiring visual distraction to stay seated at the table, using positive parenting strategies, and generalize skills and strategies learned during dinner to eating at restaurants.

Functional Assessment Summary
The insights gained from the F.A. are summarized below.

Behaviours of Concern: food refusal, shouting, crying, whining, defiant statements (“no, not supper time”), leaving table/running away, throwing food, and physically resisting parent’s assistance.

Contextual Events that Set the Stage for Problem Behaviour. There are two contextual events that increase the likelihood that Robbie will engage in problem behaviour during the dinner routine: (a) tired at the end of the day due to a long day of school and therapy sessions; and (b) long history of food refusal behaviour.

Immediate Triggers for Problem Behaviour. The trigger for problem behaviour is a request to come to dinner or eat non-preferred foods.

Consequences that Inadvertently Reinforce Problem Behaviour: Research shows that children with developmental disabilities engage in problem behaviour because it helps them achieve what they want or avoid what they don’t want. Robbie has learned that problem behaviour at dinner helps him to escape/avoid the request to eat non-preferred foods. Specifically, when Robbie engages in problem behaviour, the request to eat the food is withdrawn. The plate of food is taken away and Robbie is permitted to leave the table or is given another food he prefers. Although these are all natural things to do in response to Robbie’s problem behaviours, it makes it more likely that he will engage in problem behaviour to escape the demands of eating new, non-preferred foods.

Behaviour Support Plan

Strategies that Set the Stage for Success

Begin feeding intervention earlier in the day: If Robbie is tired he is less likely to be cooperative with sitting at the table and trying new foods. As a result, it is recommended that intervention start earlier in the day (4:30 pm) and as Robbie becomes more successful with eating new foods, introduce the foods during the dinner hour.
**Establish an instructional universe of foods:** To promote generalization of Robbie’s eating, choose three foods from each of the four major food groups (e.g., fruits, vegetables, meats/meat alternatives, grains). Foods targeted for intervention include the following: (a) carrots; (b) peas; (c) broccoli; (d) grapes; (e) watermelon; (f) strawberries; (g) tortellini; (h) pizza; (i) rice; (j) chicken; (k) fish sticks; and (l) hamburger.

**Increase Robbie’s motivation to accept new, non-preferred foods:** Robbie is likely to be more motivated to eat non-preferred foods if the following conditions are present. First, 2-3 hours prior to dinner or a feeding session, Robbie is not allowed any food, milk, or juice. Second, Robbie’s access to highly preferred toys and/or food reinforcers is limited to ONLY the feeding sessions/dinner routine.

**Initiate new foods with interventionist:** To address Robbie’s long history of food refusal, non-preferred foods can be introduced with the interventionist during feeding sessions. Feeding sessions will take place in the family room. To being no family members will be present. Once Robbie is eating age-appropriate portions of 5-6 non-preferred foods, implementation of the support procedures are transferred to the parent in the natural dinner routine.

**Massed trials of targeted foods:** Robbie’s resistance to trying new foods can be reduced through repeated exposure to the new food. Research has shown that as many as 10-15 exposures may be needed to reduce resistance and increase acceptance of new foods. Exposure involves having Robbie take a small taste of the food with the expectation that the “taste” is swallowed. To increase Robbie’s exposure to new foods, such foods will be presented to him in a massed trial format. Feeding sessions with consist of two sets of 10-15 trials separated by a short break.

**NOTE:** With each new food introduced, the expectation for the first few trials will be for Robbie to touch the food, smell the food, put to his lips, lick with his tongue, before tasting. Providing Robbie with easier requests will create momentum for more difficult requests such as “taste” the food.

**Use visually mediated positive contingency to increase predictability and motivation with eating new foods:** Robbie maybe happier and more motivated to try new things if he understands what is expected of him and what he will get as a reinforcer for meeting those expectations. A visually mediated positive contingency provides him with such information. Prior to a feeding session/dinner, with Robbie, develop a visual contingency showing him what foods he will be eating that day (drawing or writing the name of the food) and how many bites of each food he is expected to eat (bites are represented with boxes on a sheet of paper). Also show Robbie what he will earn after a specified number of bites (i.e., treat) and what he will earn when the feeding session/dinner ends. After each bite of food is consumed, cross off the box that represents that bite. Then count out how many bites are left before Robbie gets a break or is done with the feeding session/dinner.

**Strategies that Prevent Problem Behaviour**
**Stimulus fading of TYPE of food:** To teach Robbie to eat non-preferred foods a hierarchy of foods will be introduced to Robbie beginning with the most preferred of the non-preferred and progressing to the least preferred of the non-preferred. If the percentage of trials of acceptance (i.e., Robbie accepts and swallows the preferred food within 30 seconds of presentation) is above 80% for two to three consecutive sessions, a new food in the hierarchy of non-preferred foods will be introduced. This stimulus fading procedure continues until Robbie is accepting all foods targeted for intervention.

**Stimulus fading of AMOUNT of food:** Once Robbie is successfully “tasting the food,” the amount he will be expected to eat will gradually increase. First, Robbie will be presented with pea-sized amounts on the spoon/fork. If the percentage of trials is above 80% (i.e., Robbie accepts and swallows the food within 30 seconds of presentation) for 2-3 consecutive sessions, the portion size will increase by a specified amount (¼ of a spoonful, ½ of a spoonful, ¾ of a spoonful). This step continues until Robbie is consuming a portion size that is nutritionally appropriate for his age (e.g., full child size, spoonful of food).

**Simultaneous presentation of preferred and non-preferred foods:** In combination with the above strategy (stimulus fading of amount of food), teach Robbie to accept new foods by (a) starting with small portions; and (b) pairing the non-preferred foods with highly preferred foods or food reinforcers (e.g., chocolate, cookies, baked beans). To begin, present the new non-preferred food with the reinforcer together on the same spoon. After a few presentations, if Robbie’s behaviour remains minimal, insert a delay between presentation of the new food and delivery of the preferred food. For example, as soon as Robbie puts the non-preferred food in his mouth, give him the reinforcer. Next, expect Robbie to chew the non-preferred food a few times before giving him the preferred food. Finally, expect Robbie to chew and swallow the non-preferred food before giving him the reinforcer.

**Offer choices:** Robbie is more likely to be successful if he feels that he has some control over the feeding intervention/dinner routine. Choice making is an effective way to give kids more control. Choices could vary from the number bites of the non-preferred food, the size of bite, the order in which he eats the food, or the reward at the end of the feeding session/meal (e.g., dessert, or fun activity).

**Use positive contingency statements** The use of natural positive contingencies is an important way that parents help their children learn to do new or difficult things. During the dinner routine, natural positive contingencies can be used to motivate Luke to come to the table and eat his dinner. Positive contingencies always include the following message, “Do [something that I want you to do] and then you will get [something that you like or want to do].” Examples include, “two more bites and then you can have a treat”, “eat all your dinner and then you can play with the iPod.”

**Strategies that Teach the Child New Skills**

**Teach Robbie to ask for a break.** If Robbie learns to ask for a break, he may be less prone to use problem behaviour to avoid or escape a demand to eat non-preferred food. When Robbie is reliably using language instead of problem behaviour to assert his wants
or needs, use a safety signal to build endurance (e.g., “Eat three more bites, and then you can take a break”).

**Consequences that Strengthen New Skills/Behaviours**

*Offer praise and preferred food* (e.g., chocolate, cookie, candy treats) contingent on Robbie meeting the desired expectation (e.g., touching new food, consuming small bites of new food).

*Offer preferred Activity* (e.g., Dad’s computer, IPod, water slide, bubbles) contingent on Robbie consuming a specified number of foods or completing his meal.

**Consequences that Ensure Problem Behaviour is Not Rewarded**

*If Robbie engages in minor problem behaviours, actively ignore and positively redirect or prompt language.* Minor problem behaviour includes non-compliance or verbal defiance, and silliness. When minor behaviour occurs, do not call attention to the problem behaviour. Simply tell Robbie what you want him to do and then prompt him to do so or prompt him to ask for a break.

*If Robbie engages in major problem behaviours, use escape extinction procedure.* Major problem behaviour includes, crying, screaming, or leaving the table. If Robbie escalates to this level of problem behaviour, use an escape extinction procedure. An escape extinction procedure includes the following steps: (1) ignore any problem behaviour such as, crying, yelling, or throwing objects; (2) if Robbie tries to leave the table block him from doing so; (3) verbally request Robbie take a bite of food; (4) if Robbie resists hold the spoon up to show that he needs to eat (5) if after 120 minutes Robbie is still refusing to try new foods, end the session in a neutral way, do not provide him with his reinforcer, simply tell him he can try again tomorrow.

**Evaluation**

Use an implementation checklist on a daily basis at first, and later on a weekly basis, to evaluate: (a) plan implementation; (b) level of problem behaviour; and (c) social validity (the importance and acceptability of the plan’s goals, procedures, and outcomes).

**Contextual Fit Considerations**

*Teach Dad to Use Support Strategies During Dinner Routine:* To ensure there is consistency between the parents, it is important for Robbie’s dad to also learn how to teach Robbie to accept new foods.

*Teach Robbie to Eat Food Commonly Served at Restaurants:* A preferred activity for Robbie’s parents is to eat out at restaurants and therefore a major goal for the family is for Robbie to eat with them at restaurants. Foods targeted for intervention will be foods commonly found on kid’s menus at restaurants.
### IMPLEMENTATION CHECKLIST

**Robbie**  
**Dinner Routine**

Date: __________________________

<table>
<thead>
<tr>
<th>Strategies to Set the Stage for Success</th>
<th>Not in Place</th>
<th>Partially in Place</th>
<th>In Place</th>
</tr>
</thead>
</table>
| 1. To ensure R was motivated to eat new foods I did the following:  
   a) I did not give R. food or drinks (except for water) 2-3 hours before a feeding session.  
   b) I limited R’s access to treats and preferred activities to only during and after dinner (e.g., chocolate, cookies, iPod)  
   c) I rotated the treats often often | 1 2 3 4 5 | NA |
| Strategies to Support a Successful Feeding Session | | | |
| 2. I showed R with a visual contingency what is expected of him and what he will get once he meets those expectations. | 1 2 3 4 5 | NA |
| 3. I offered R. choices (e.g., type of new food; number of bites, size of bites; type of food reinforcer; etc.) | 1 2 3 4 5 | NA |
| 4. I introduced foods according to a hierarchy of most preferred of the non-preferred to the least preferred of the non-preferred foods. | 1 2 3 4 5 | NA |
| 5. I presented new foods in a massed trial format. To begin, I asked R. to touch, smell, put to lips and finally take small “tastes” of the food with the expectation that he swallow the “taste.” I did 10-15 trials of each food. | 1 2 3 4 5 | NA |
| 6. Once R. successfully tastes the food, I gradually increased the amount of food he was expected to eat starting with pea-sized amounts and increasing to age-appropriate foods. | 1 2 3 4 5 | NA |
| 7. For new foods, I presented the new food simultaneous with a highly preferred food/treat. | 1 2 3 4 5 | NA |
| 8. I used positive contingency statements to motivate R. to eat new foods. E.g., “one more bite and then you choose a treat”; “Take a big bite and you’ll get two M & M’s” | 1 2 3 4 5 | NA |
| 9. I taught R to ask for a break. I reminded R before the feeding session that if he needed a break to just ask. | 1 2 3 4 5 | NA |
10. I offered praise and a bite of preferred food/drink contingent on R. meeting the desired expectation.  

11. I offered R. a preferred activity contingent on him consuming a specified number of bites or completing his meal.  

12. If R. asked for a break, I honoured his request by giving him a short, timed break.  

13. If minor problem behaviours occur I actively ignored and redirected R. to take a bite and/or prompted him to ask for a break;  

14. If major problem behaviours occur (e.g., spitting out food, turning head away, throwing food, leaving the table etc.), I ignored all behaviours, I did not comment or give any disapproving looks. If R. left the table, I redirected him back to his seat. I continued to present the food until he accepted. For example, every 30 seconds, I requested he take a bite. I praised compliance. If after 120 minutes, R. still has not tried the food, I ended the session, did not give reinforcer, and reassured him he could try again the next day.

<table>
<thead>
<tr>
<th>Problem Behaviours</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5 or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Verbal Non-compliance</td>
<td></td>
<td></td>
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<tr>
<td>2) Turn head away/Pushing spoon away/closing mouth</td>
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<tr>
<td>3) Making counter demands</td>
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<tr>
<td>4) Aggression (e.g., hitting, biting)</td>
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<tr>
<td>5) Leaving table</td>
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<tr>
<td>6) Spitting</td>
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<td>7) Throwing food</td>
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<td>8) Crying/Yelling</td>
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</table>

Social Validity

Disagree

Agree

1. The goals of the dinner routine are acceptable and important

2. The strategies are useful and effective.

3. The strategies are difficult to use.

4. Robbie is successful during dinner.

Time it took to finish the meal: _______________________________________

Food served: __________________________________________________________

Treats/Preferred Activities Used: _______________________________________
**Implementation Plan**

Training Materials
1) Binder, paper, felt pens, stickers, data sheets (to be purchased and developed by Lauren)
2) Food and activity reinforcers (to be purchased by mom)

1. Set up structured feeding sessions outside the natural meal routine
   a. Interventionist implement the behaviour support strategies
   d. Collect data/Monitor progress

2. The interventionist teaches Robbie to eat 5 non-preferred foods.

3. Once Robbie reaches criteria for 5 foods, the interventionist transfers implementation of
   the support procedures to the natural meal setting The
   interventionist teaches Robbie to eat the 6th food in the natural setting.

4. Once Robbie reaches criteria for 6 non-preferred foods the interventionist
   systematically transfers stimulus control to mom during the dinner routine. There are four
   steps to transferring stimulus control to the parent:

   (a) parent observes the interventionist modeling the behavioural feeding
       strategies and is prompted by the interventionist to praise their child for
       acceptance of food;

   (b) parent practices/role plays the feeding procedures with the interventionist
       outside the feeding session;

   (c) parent feeds the child while the interventionist provides coaching,
       feedback, and positive reinforcement;

   (d) parent feeds the child with the interventionist nearby but not in view.
Josh’s Behaviour support Plan
Snack Routine
May, 2008

Family Vision of a Successful Snack Routine
Josh will participate in snack routine with mom, younger brother (dad on the weekend), in the kitchen. The routine will begin approximately at 10:30 or 2:30 and last a minimum of 15 minutes. Josh’s tasks are to come to the table and sit down, eat all of his food, stay seated for the entire snack, drink from a cup, converse with family members, use utensils, ask for more, and when finished put plate in the sink. Child and family-centered goals for this routine include, expanding diet to include foods from all major food groups, learning about mealtime etiquette, using utensils, and the family have relaxing time together while eating.

Functional Assessment Summary
The insights gained from the F.A. are summarized below.

Behaviours of Concern: food refusal, shouting, crying, whining, defiant statements, leaving table/running away, throwing food or items, and physically resisting parent’s assistance.

Contextual Events that Set the Stage for Problem Behaviour. There are two contextual events that increase the likelihood that Josh will engage in problem behaviour during snack: (a) risk of Josh experiencing a low in blood sugar levels; and (b) long history of food refusal behaviour.

Immediate Triggers for Problem Behaviour. The trigger for problem behaviour is a request to come to the table eat non-preferred foods.

Consequences that Inadvertently Reinforce Problem Behaviour: Research shows that children with developmental disabilities engage in problem behaviour because it helps them achieve what they want or avoid what they don’t want. Josh has learned that problem behaviour during snack helps him to escape/avoid the request to eat non-preferred foods. Specifically, when Josh engages in problem behaviour, the request to eat the food is withdrawn. The plate of food is taken away and Josh is permitted to leave the table or is given another food he prefers (e.g., chips, cookies). Although these are all natural things to do in response to Josh’s problem behaviours, it makes it more likely that he will engage in problem behaviour to escape the demands of eating new, non-preferred foods.

Behaviour Support Plan

Strategies that Set the Stage for Success

Increase Josh’s motivation to accept new, non-preferred foods: Josh is likely to be more motivated to eat new, non-preferred foods if feeding sessions occur in the afternoon and
during a time when Josh is most hungry. Typically it is recommended that a child have little food or drink 3-4 hours prior to a session. However, with Josh at risk for experiencing a low in his blood sugar level, it is recommended that Josh be hungry but not so hungry that his blood sugar level may drop to a dangerously low level. This means at the beginning of the feeding session Josh’s blood sugar will be tested. If his sugar level is low, the first few trials of the feeding session will be exceptionally easy for Josh so that he can access the reinforcer quickly (e.g., eat preferred food) so that his blood sugar level rises to a normative level. Alternatively, if his blood sugar is extremely low, the feeding session will be delayed until Josh eats some food and his blood sugar level returns to a safe level.

In addition, to increase Josh’s motivation to eat new, non-preferred foods, ensure that Josh’s access to highly preferred toys and/or food reinforcers are limited to ONLY the feeding sessions.

**Establish an instructional universe of foods:** To promote generalization of Josh’s eating, choose three foods from each of the four major food groups (e.g., fruits, vegetables, meats/meat alternatives, grains). Foods targeted for intervention include the following: (a) apple; (b) banana; (c) grapes; (d) carrots; (e) avocado; (f) cucumber; (g) tofu hotdog; (h) turkey bacon; (i) cheese; (j) peanuts; (k) cream cheese on cracker; (l) peanut butter on cracker; (m) nutella on cracker; and (n) tortilla with peanut butter. hamburger.

**Initiate new foods with interventionist:** To address Josh’s long history of food refusal, non-preferred foods can be introduced with the interventionist during feeding sessions. Feeding sessions may take place at a small table in the living room. Once Josh is eating age-appropriate portions of 5-6 non-preferred foods, implementation of the support procedures are transferred to the parent in the natural snack routine.

**Massed trials of targeted foods:** Josh’s resistance to trying new foods can be reduced through repeated exposure to the new food. Research has shown that as many as 10-15 exposures may be needed to reduce resistance and increase acceptance of new foods. Exposure involves having Josh take a small taste of the food with the expectation that the “taste” is swallowed. To increase Josh’s exposure to new foods, such foods will be presented to him in a massed trial format. Feeding sessions with consist of two sets of 10-15 trials separated by a short break.

**NOTE:** With each new food introduced, the expectation for the first few trials will be for Josh to touch the food, smell the food, put to his lips and so on, before tasting. Providing Josh with easier requests will create momentum for more difficult requests such as “tasting” the food.

**Use visually mediated positive contingency to increase predictability and motivation with eating new foods:** Josh maybe happier and more motivated to try new things if he understands what is expected of him and what he will get as a reinforcer for meeting those expectations. A visually mediated positive contingency provides him with such information. Prior to a feeding session/snack, with Josh, develop a visual contingency showing him what foods he will be eating that day (drawing or writing the name of the food) and how many bites
of each food he is expected to eat (bites are represented with boxes on a sheet of paper). Also show Josh what he will earn after a specified number of bites (i.e., treat) and what he will earn when the feeding session/snack ends. After each bite of food is consumed, cross off the box that represents that bite. Then count out how many bites are left before Josh gets a break or is done with the feeding session/snack.

**Strategies that Prevent Problem Behaviour**

**Stimulus fading of TYPE of food:** To teach Josh to eat non-preferred foods a hierarchy of foods will be introduced to Josh beginning with the most preferred of the non-preferred and progressing to the least preferred of the non-preferred. If the percentage of trials of acceptance (i.e., Josh accepts and swallows the preferred food within 30 seconds of presentation) is above 80% for two to three consecutive sessions, a new food in the hierarchy of non-preferred foods will be introduced. This stimulus fading procedure continues until Josh is accepting all foods targeted for intervention.

**Stimulus fading of AMOUNT of food:** Once Josh is successfully “tasting the food,” the amount he will be expected to eat will gradually increase. First, Josh will be presented with pea-sized amounts on the spoon/fork. If the percentage of trials is above 80% (i.e., Josh accepts and swallows the food within 30 seconds of presentation) for 2-3 consecutive sessions, the portion size will increase by a specified amount (¼ of a spoonful, ½ of a spoonful, ¾ of a spoonful). This step continues until Josh is consuming a portion size that is nutritionally appropriate for his age (e.g., full child size, spoonful of food).

**Simultaneous presentation of preferred and non-preferred foods:** In combination with the above strategy (stimulus fading of amount of food), teach Josh to accept new foods by (a) starting with small portions; and (b) pairing the non-preferred foods with highly preferred foods or food reinforcers (e.g., chocolate, chips, peanut butter). To begin, present the new non-preferred food with the reinforcer together on the same spoon. After a few presentations, if Josh’s behaviour remains minimal, insert a delay between presentation of the new food and delivery of the preferred food. For example, as soon as Josh puts the non-preferred food in his mouth, give him the reinforcer. Next, expect Josh to chew the non-preferred food a few times before giving him the preferred food. Finally, expect Josh to chew and swallow the non-preferred food before giving him the reinforcer.

**Offer choices:** Josh is more likely to be successful if he feels that he has some control over the feeding intervention/dinner routine. Choice making is an effective way to give kids more control. Choices could vary from the number bites of the non-preferred food, the size of bite, the order in which he eats the food, or the reward at the end of the feeding session/meal (e.g., type of treat, or fun activity).

**Strategies that Teach the Child New Skills**

**Teach Josh to ask for a break.** If Josh learns to ask for a break, he may be less prone to use problem behaviour to avoid or escape a demand to eat non-preferred food. When Josh is
reliably using language instead of problem behaviour to assert his wants or needs, use a safety signal to build endurance (e.g., “Eat three more bites, and then you can take a break”).

**Consequences that Strengthen New Skills/Behaviours**

*Offer praise and preferred food* (e.g., chips, cookies) contingent on Josh meeting the desired expectation (e.g., touching new food, consuming small bites of new food).

*Offer preferred activity* (e.g., T.V., trains, puzzle) contingent on Josh consuming a specified number of foods or completing his meal.

**Consequences that Ensure Problem Behaviour is Not Rewarded**

If Josh engages in minor problem behaviours, actively ignore and positively redirect or prompt language. Minor problem behaviour includes whining, non-compliance, pushing plate away, or verbal defiance. When minor behaviour occurs, do not call attention to the problem behaviour. Simply tell Josh what you want him to do and then prompt him to do so or prompt him to ask for a break.

If Josh engages in major problem behaviours, use escape extinction procedure. Major problem behaviour includes, throwing food, crying, screaming, or leaving the table. If Josh escalates to this level of problem behaviour, use an escape extinction procedure. An escape extinction procedure includes the following steps: (1) ignore any problem behaviour such as, crying, yelling, or throwing objects; (2) if Josh tries to leave the table block him from doing so; (3) verbally request Josh take a bite of food; (4) if Josh resists hold the spoon up to show that he needs to eat (5) if after 120 minutes Josh is still refusing to try new foods, end the session in a neutral way, do not provide him with his reinforcer, simply tell him he can try again tomorrow.

**Evaluation**

Use an implementation checklist on a daily basis at first, and later on a weekly basis, to evaluate: (a) plan implementation; (b) level of problem behaviour; and (c) social validity (the importance and acceptability of the plan’s goals, procedures, and outcomes).

**Contextual Fit Considerations**

*Select Protein Enriched Foods For Intervention:* Due to Josh’s diabetes, a major goal for Josh’s parents is to introduce protein enriched foods into Josh’s diet. Thus the majority of foods chosen for intervention will be high in protein.

*Teach Dad to Use Support Strategies During Snack Routine:* To ensure there is consistency between the parents, it is important for Josh’s dad to also learn how to teach Josh to accept new foods.
Offer Younger Brother Toys to Play With During Snack Routine: Because Josh’s younger brother finishes snack much sooner than Josh it is important to keep him busy so that Mom can devote her time and energy to supporting Josh with his snack. An effective way to keep the younger brother busy is to offer him a choice of toys to play with after he finishes his snack. These toys can be kept in a box and only be offered to the younger brother during snack. Also, to ensure the toys remain motivating for the younger brother in that he continues to play with them, rotate them often.
## IMPLEMENTATION CHECKLIST

**Josh**  
**Snack Routine**

Date: __________________________________

<table>
<thead>
<tr>
<th>Strategies to Set the Stage for Success</th>
<th>Not in Place</th>
<th>Partially in Place</th>
<th>In Place</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.</strong> To ensure J. was motivated to eat new foods I did the following:</td>
<td>1 2 3 4 5 NA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) I made sure he was hungry. I checked his blood sugar prior to snack and if low, I gave him easy highly preferred foods to start.</td>
<td>1 2 3 4 5 NA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) I limited J’s access to treats and preferred activities to only during and after snack</td>
<td>1 2 3 4 5 NA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) I rotated the treats often often</td>
<td>1 2 3 4 5 NA</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Strategies to Support a Successful Feeding Session</th>
<th>Not in Place</th>
<th>Partially in Place</th>
<th>In Place</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2.</strong> I showed J. with a visual contingency how many bites he is expected to eat and when he will earn his treats. For new foods I remembered to show him he can have a treat after the first bite.</td>
<td>1 2 3 4 5 NA</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>3.</strong> I offered J. choices (e.g., type of new food; number of bites, size of bites; type of food reinforcer; how many bites with a peanut butter)</td>
<td>1 2 3 4 5 NA</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>4.</strong> I introduced foods according to a hierarchy of most preferred of the non-preferred to the least preferred of the non-preferred foods.</td>
<td>1 2 3 4 5 NA</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>5.</strong> I presented new foods in a massed trial format. To begin, I asked J. to touch, smell, put to lips and finally take small “tastes” of the food with the expectation that he swallow the “taste.” I did 10-15 trials of each food.</td>
<td>1 2 3 4 5 NA</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>6.</strong> Once J. successfully tastes the food, I gradually increased the amount of food he was expected to eat starting with pea-sized amounts and increasing to age-appropriate foods.</td>
<td>1 2 3 4 5 NA</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>7.</strong> For new foods, I paired the new food with a highly preferred food/reinforcer.</td>
<td>1 2 3 4 5 NA</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
E.g., I put peanut butter on the apple/banana, Rolled the banana with sprinkles or allowed him to eat the bite of food and the treat simultaneously. I faded the highly preferred food/reinforcer gradually. For example, I alternated bites with peanut butter with bites without. OR, I faded to having J. chew five times before he can have the treat.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.</td>
<td>I used positive contingency statements to motivate J. to eat new foods. E.g., “one more bite and then you choose a treat”; “Take a big bite and you’ll get two bites of chocolate”</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>9.</td>
<td>I taught J to ask for a break. I reminded J before the feeding session that if he needed a break to just ask.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>10.</td>
<td>I offered praise and a bite of preferred food contingent on J. meeting the desired expectation.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>11.</td>
<td>I offered J. a preferred activity contingent on him consuming a specified number of bites or completing his meal.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>12.</td>
<td>If J. asked for a break, I honoured his request by giving him a short, timed break.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>13.</td>
<td>If minor problem behaviours occur I actively ignored and redirected J. to take a bite and/or prompted him to ask for a break;</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>14.</td>
<td>If major problem behaviours occur (e.g., spitting out food, turning head away, throwing food, leaving the table etc.), I ignored all behaviours, I did not comment or give any disapproving looks. If J. left the table, I redirected him back to his seat. I continued to present the food until he accepted. For example, every 30 seconds, I requested he take a bite. I praised compliance. If after 120 minutes, J. still had not tried the food, I ended the session, did not give reinforcer, and reassured him he could try again the next day.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

Problem Behaviours

<table>
<thead>
<tr>
<th>Problem Behaviour</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5 or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Verbal Non-compliance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2) Turn head away/Pushing spoon</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>away/closing mouth</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5 or more</td>
</tr>
<tr>
<td>--------------------------------------------------------</td>
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<td>---</td>
<td>---</td>
<td>---</td>
<td>-----------</td>
</tr>
<tr>
<td>3) Aggression (e.g., hitting, biting)</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5 or more</td>
</tr>
<tr>
<td>4) Leaving table</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5 or more</td>
</tr>
<tr>
<td>5) Spitting</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5 or more</td>
</tr>
<tr>
<td>6) Throwing food/items</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5 or more</td>
</tr>
<tr>
<td>7) Crying/Yelling</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5 or more</td>
</tr>
</tbody>
</table>

**Social Validity**

<table>
<thead>
<tr>
<th></th>
<th>Disagree</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The goals of the snack routine are acceptable and important</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>2. The strategies are useful and effective.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>3. The strategies are difficult to use.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>4. Josh is successful during snack.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

Time it took to finish the meal: _______________________________________

Food served: _______________________________________________________

Treats/Preferred Activities Used: _____________________________________
Implementation Plan

Training Materials
1) Binder, paper, felt pens, stickers, data sheets (purchased and developed by Lauren)
2) Food charts (developed by Lauren)
3) Small table and chairs (to be purchased by parents)
4) Food reinforcers (to be purchased by Mom)

Sequence of Training Activities:

1. Set up structured feeding sessions outside the natural meal routine
   a. Different table
   b. Different room
   c. Interventionist implement the behaviour support strategies with Josh
   d. Collect data/Monitor progress

2. The interventionist teaches Josh to eat 5-6 new, non-preferred foods.

3. Once Josh is accepting and consuming 5 new foods with minimal problem behaviour,
   the interventionist transfers implementation of the support procedures to the natural meal
   setting. The interventionist teaches Josh to eat the 6th food in the natural setting.

4. Once Josh reaches criteria for 6 non-preferred foods the interventionist
   systematically transfers stimulus control to mom during the snack routine. There are
   four steps to transferring stimulus control to the parent:
   a) Parent observes the interventionist modeling the behavioural feeding strategies and is
      prompted by the interventionist to praise their child for acceptance of food;
   b) Parent practices/role plays the feeding procedures with the interventionist outside the
      feeding session.
   c) Parent feeds the child while the interventionist provides coaching, feedback, and
      positive reinforcement;
   d) Parent feeds the child with the interventionist nearby but not in view.
APPENDIX H

Luke: Dinner Routine
Strategies for Overcoming Potential Challenges to the Maintenance of Behaviour Supports and Parent Use of Effective Practices
August 2008

Below are several considerations and strategies for overcoming potential challenges to the maintenance of effective behaviour support with your son in the dinner routine. Each consideration or strategy is based on what we all have learned about the things that might interfere with your continued progress and success together as a family. Each consideration and strategy represents things that are important for maintaining long-term improvements in child behaviour and your use of effective parenting practices. These things include ways of acting but also ways of thinking that you have adopted and that have served your children and family well.

The purpose of the narrative below is to highlight these strategies and considerations so that they may continue to inform your child’s development and your excellent work as a parent for a very long time

1. **Continuing to present foods on Luke’s “mastered list” at least once a month.**
   Given Luke’s long history of food refusal behaviour, the progress you have made in the past six months can easily unravel without continued maintenance support. One important component of maintenance support is keeping track of foods presented to Luke to ensure that all previously mastered foods are presented to Luke at least once a month. Without continuous presentation there is risk that Luke will drop foods from his diet or show more resistance the next time it is presented. Keeping a list of foods Luke has mastered in a convenient location that you can refer to daily can help you with maintaining the success you have achieved. See end of document for list of mastered foods.

2. **Continuing to expose Luke to new foods or new variations of previously mastered foods.**
   Luke’s continued flexibility with trying new foods/new variations of mastered foods and incorporating them into his expanding diet is largely dependent on your behaviours. If you wish Luke to try new foods with minimal resistance than it is important that you continue to expose Luke to new foods on a regular basis (i.e., once a week/10 days).

3. **Continuing to present a new food that is initially challenging for Luke**
   Experience has shown that Luke’s initial resistance to new foods does not mean he definitively dislikes the food (e.g., tortellini, hamburger soup). With continuous exposure, that is, the food is presented regularly for at least a month Luke adjusts to the food’s texture, taste, and appearance and will begin to eat age appropriate portions in a suitable amount of time. Paying attention to this pattern will help you to work through any resistance and continue moving forward in expanding Luke’s diet.

4. **Remembering to stay calm in the midst of unanticipated problem behaviours.**
For most children, focusing on minor problem behaviours tends to increase these behaviours. Although the reprimand or a disapproving look may sometimes work in changing the child’s behaviour, in the long run, such strategies tend to increase problem behaviour. Strategies that are more likely to decrease problem behaviour in the long run include active ignoring and redirection (e.g., take a bite and then we can talk), and differential reinforcement of appropriate behaviours (praising and giving Luke treats for good sitting, or eating easy foods). In some instances if problem behaviour continues, it may be necessary to implement a response cost procedure in that Luke receives three warnings before losing a preferred activity.

5. **Proactively planning to prevent or overcome regressions with progress in the routine.**

Inevitably setting events will occur across that year that may disrupt progress in the routine. Major setting events relevant to the dinner routine include illness or a family vacation. To ensure the routine remains successful, while the setting event is occurring it is important to decrease your expectations on where, what, and how much Luke eats. For example, while on vacation offer Luke highly preferred foods (i.e., foods you are confident he will accept without any resistance) in a setting he is most comfortable (e.g., hotel room/sitting in his stroller). Once you return from vacation, use *behavioural momentum* to reestablish the dinner routine. Specifically, for the first few days after returning from vacation offer Luke easy, preferred foods at dinner. The success you experience with Luke will create momentum for Luke accepting a more challenging food (i.e., a food he has not eaten in the past month). Additionally, to increase the likelihood of Luke accepting the more challenging food, increase reinforcement during the dinner routine. For example, introduce a new game/activity to play at the table, or offer him a small toy he can earn contingent on eating his meal. These same strategies apply during times when Luke has been ill or is recovering from surgery.

6. **Accurately observing and evaluating one’s own behavior in relation to Luke.**

One of the hardest things to do is accurately monitor and evaluate one’s own behavior. This is because in western society we are not taught to self-reflect on our behaviour. We are taught to think about our behaviour but not observe it. Accurately monitoring one’s own behavior also is especially difficult when one is busy, tired, sleepy, ill, or experiencing anxiety due to a life stressor (e.g., financial difficulties, family relations). During the dinner routine, it will be important to self-monitor and self-evaluate one’s own behavior to ensure that it is consistent with actions that help Luke stay seated at the table and eat his dinner. For example, when you are sitting at the table with Luke and observe him taking a bite of food by himself you need to self-monitor and self-evaluate the extent to which you praise Luke and provide him with positive attention for these appropriate behaviours. When Luke is refusing to eat, you need to self-monitor and self-evaluate whether you implemented the consequence procedures effectively. That is, did you ignore problem behaviours, did you state the contingency calmly (you need to eat to play the game) and if problem behaviours continued to did you provide him with three warnings before removing a preferred activity? This self-monitoring and self-evaluating is essential if you wish to maintain the quality of implementation that has helped Luke come to the table, stay seated for meals, and eat all of his food.
When regression occurs, use the implementation checklist to evaluate the use of strategies and how the plan might be implemented better or improved. The most common reason why behaviour support plans fail in the long run is that they succeed in the short term. When parents implement a plan that works, it is common to gradually, over time, stop using behavior support plan strategies. Within a few days, weeks, or months, enough support strategies have been suspended that the child no longer experiences proactive, positive behavior support; rather, the child begins to re-experience the antecedent and consequent events that trigger and maintain problem behavior. When this happens, because it is not common to see the relationship between what we do and what our child does, it is more common for adults (be they professional or parents) to say that the plan no longer works. We remember that we used the plan and we have the idea that we are using positive behaviour support strategies. But because we have not self-monitored our actual behavior, we are not able to see how our actions gradually moved away from those consistent with support plan features. The best solution to this common threat to the long-term use of plan strategies is to regularly self-monitor plan implementation. The best way to do so is to use the implementation checklist at least once a week.

Luke’s List of Mastered Foods

<table>
<thead>
<tr>
<th>Meat/Legumes</th>
<th>Vegetables</th>
<th>Fruits</th>
<th>Dishes/Pasta/Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Baked Beans</td>
<td>5. Pea pods</td>
<td>5. Chef Boyardee</td>
<td>5. Grilled Cheese</td>
</tr>
<tr>
<td></td>
<td>10. Vegetable soup</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>11. Quiche</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>12. Tuna sandwich</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>13. Frozen chicken dinner</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**MAINTENANCE IMPLEMENTATION CHECKLIST**

Luke Dinner Routine

Date: __________________________

<table>
<thead>
<tr>
<th>Strategies to Set the Stage for Success</th>
<th>Not in Place</th>
<th>Partially in Place</th>
<th>In Place</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. To ensure L. was motivated I did the following:</td>
<td>1 2 3 4 5 NA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) I limited his access to reinforcers to only after during/after dinner</td>
<td>1 2 3 4 5 NA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) I rotated the reinforcers often (e.g., new books, new treats)</td>
<td>1 2 3 4 5 NA</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Strategies to Support a Successful Transition To the Dinner Table**

| 2. I phrased my request to come to the table as a positive contingency statement (e.g., come to the table and see what’s waiting for you). | 1 2 3 4 5 NA |
| 3. I gave praise and preferred food contingent on Luke coming to the table and sitting down. | 1 2 3 4 5 NA |
| 4. If Luke engaged in problem behaviour during the transition, | 1 2 3 4 5 NA |
| a) I ignored all behaviours | |
| b) I gave Luke a warning, “come to the table now or there will be no surprise” | |
| c) I counted to five | |
| d) If still problem behaviour, I walked to the table | |
| e) If Luke didn’t follow, I then physically guided him to the table and redirected him to the task of eating easy foods. I did not give him the surprise. | |

**Strategies to Support a Successful Dinner Routine**

| 5. At the beginning of the meal I showed Luke with visuals what foods he was going to eat, his choice of dessert, and what fun activities would be happening after dinner. | 1 2 3 4 5 |
| 6. I offered L. choices (e.g., number of bites, size of bites; type of food reinforcer; fork or spoon, type of condiment, type of fun activity) | 1 2 3 4 5 |
| 7. For new foods I gradually increased the number of bites Luke was expected to eat starting with 1-2 bites and increasing to age-appropriate portion size. | 1 2 3 4 5 NA |
| 8. For new foods or foods that I anticipate will be difficult for Luke (e.g., salmon, lasagna) I offered him a treat immediately after he put the bite of food in his mouth. | 1 2 3 4 5 NA |
| 9. I reminded L. before dinner that if he needed a break to just ask. I honoured his requests but set a limit of five breaks. | 1 2 3 4 5 |
| 10. Instead of distracting Luke with a sticker book, game, or story, I remembered to teach Luke that if he does what I want (eat), he will get what he wants (reinforcer). This will help me maintain control over Luke’s behaviour during dinner. | 1 2 3 4 5 |
| 11. I offered praise contingent on Luke eating bites of | 1 2 3 4 5 |
12. I offered L. a preferred activity contingent on him consuming a specified number of bites or completing his meal.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
</table>

13. If minor problem behaviours occur (e.g., “I’m angry, I’m not feeling very well”, whining, covering his mouth) I did the following:
   a) I ignored all behaviours, I did not comment or give any disapproving looks.
   b) I continued to present the bite of food and every 30 seconds requested Luke take a bite. I also at this time kept reminding him of the contingency, “if you want me to read more, you need to eat”
   c) If minor behaviours continued I prompted Luke to take a break.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
</table>

14. If major problem behaviours occurred (e.g., spitting out food, turning head away, throwing food, screaming, leaving the table etc.) I did the following:
   a) I remained calm and presented the 3 strikes on a visual contingency
   b) I said gently, “If you don’t start eating I will have to put a strike here”;
   c) I then counted to 5 and if Luke had not initiated I marked a strike.
   d) I repeated steps b & c until he complied or received 3 strikes
   e) If he complied, then I praised him and reminded him that he will earn reward
   f) If he received 3 strikes, I sympathetically let him know that he did not earn the reward
   g) I also reminded him that he still needed to eat his food (minimum three bites)
   h) I then actively ignored all protests and calmly redirected L. back to eating. If after 60 minutes Luke still did not eat his food, I calmly let him leave the table.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
</table>

15. If Luke leaves the table I did the following:
   a) I did not chase after him. I waited a few seconds until he settled somewhere and then went to him.
   b) Calmly deliver the warning (three strikes rule)
   c) Count to five. If/when Luke gets back to the table praise him AFTER he has taken a bite or two of food.
   d) If Luke doesn’t start walking back to the table, calmly redirected him back to his chair. Remember not to comment on his behaviour or show any emotion
   e) Once Luke is in his chair, mark a strike on his three strikes visual.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
</table>

**Strategies to Promote Long term Success With Dinner**

<table>
<thead>
<tr>
<th></th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>I continued to present mastered foods at least once a month</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>I continued to introduce L. to new foods or new variations of previously mastered foods at least once a week/ every 10 days.</td>
<td></td>
</tr>
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<td>3.</td>
<td>For foods that were initially challenging for L. I remembered that it can take up to 10 exposures with a new food before a child will develop a preference</td>
<td></td>
</tr>
</tbody>
</table>
for that food. With this in mind, I continued to present the food to L. many times, very soon after the initial presentation.

4. I reviewed this checklist once a week to self-monitor my use of the strategies.

5. I remembered to be proactive to prevent or overcome setting events (e.g., illness, vacation)

6. I remembered to stay calm in the midst of unanticipated problem behaviours

<table>
<thead>
<tr>
<th>Problem Behaviours</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5 or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Food Refusal (turning head away, covering mouth, saying no, disgusting etc.)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5 or more</td>
</tr>
<tr>
<td>2) Spitting or Spitting out Food</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5 or more</td>
</tr>
<tr>
<td>3) Leaving Table</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5 or more</td>
</tr>
<tr>
<td>4) Throwing items/knocking things over</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5 or more</td>
</tr>
<tr>
<td>5) Screaming</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5 or more</td>
</tr>
<tr>
<td>6) Silly Behaviours</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5 or more</td>
</tr>
<tr>
<td>7) Physical Aggression</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5 or more</td>
</tr>
</tbody>
</table>
CONGRATULATIONS!! You have successfully transformed COERCIVE patterns of interaction (where your child’s problem behavior dictates how meal routines are conducted) to CONSTRUCTIVE patterns of interaction (where you guide your child through meals and TEACH him new skills and behaviors). To help you monitor your progress and MAINTAIN the improvements you’ve made, complete this checklist once each week.

<table>
<thead>
<tr>
<th>When a demand/request is made at dinner</th>
<th>Did Luke respond to the request by engaging in one or more of the following PROBLEM BEHAVIOURS?</th>
<th>Did you RESPOND to Luke’s problem behavior by:</th>
<th>Did Luke respond by REDUCING or STOPPING problem behavior?</th>
</tr>
</thead>
<tbody>
<tr>
<td>o Protest/Whine</td>
<td>o Removing your request to come to the table</td>
<td>YES                                               or                                           NO</td>
<td></td>
</tr>
<tr>
<td>o Cry</td>
<td>o Taking the non-preferred foods off his plate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Scream/Tantrum</td>
<td>o Decreasing the amount of food you wanted him to eat</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Hit/Push</td>
<td>o Offering a different food</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Throw food/items</td>
<td>o Offering a treat/fun activity to motivate or encourage L to eat the non-preferred food</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Spit</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Run away</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Offer hugs or physical affection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>YES or NO</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

IF YOU ANSWERED ‘YES’ TO ALL THREE, YOU HAVE RETURNED TO A COERCIVE PROCESS. REVIEW THE PLAN AND IMPLEMENT ALL OF THE STRATEGIES TO MOVE BACK TO A CONSTRUCTIVE PROCESS. IF YOU STILL NEED HELP, CALL OR EMAIL LAUREN.
Below are several considerations and strategies for overcoming potential challenges to the maintenance of effective behaviour support with your son in the dinner routine. Each consideration or strategy is based on what we all have learned about the things that might interfere with your continued progress and success together as a family. Each consideration and strategy represents things that are important for maintaining long-term improvements in child behaviour and your use of effective parenting practices. The purpose of the narrative below is to highlight these strategies and considerations so that they may continue to inform your child’s development and your excellent work as a parent for a very long time.

1. **Continuing to present foods on Robbie’s “mastered list” at least once a month.**
   Given Robbie’s long history of food refusal behaviour, the progress you have made in the past six months can easily unravel without continued maintenance support. One important component of maintenance support is keeping track of foods presented to Robbie to ensure that all previously mastered foods are presented to him at least once a month. Without continuous presentation there is risk that Robbie will drop foods from his diet or show more resistance the next time it is presented. Keeping a list of foods Robbie has mastered in a convenient location that you can refer to daily can help you with maintaining the success you have achieved. See end of document for list of mastered foods.

2. **Continuing to expose Robbie to new foods or new variations of previously mastered foods.**
   Robbie’s continued flexibility with trying new foods/new variations of mastered foods and incorporating them into his expanding diet is largely dependent on your behaviours. If you wish Robbie to try new foods with minimal resistance than it is important that you continue to expose Robbie to new foods on a regular basis (i.e., once a week).

3. **Continuing to present a new food that is initially challenging for Robbie**
   Experience has shown that Robbie’s initial resistance to a new food does not mean he definitively dislikes the food (e.g., carrots, broccoli). With continuous exposure, that is, the food is presented regularly for at least a month Robbie adjusts to the food’s texture, taste, and appearance and will begin to eat age appropriate portions in a suitable amount of time. Paying attention to this pattern will help you to work through any resistance and continue moving forward in expanding Robbie’s diet.

4. **Remembering to stay calm in the midst of unanticipated problem behaviours.**
   For most children, focusing on minor problem behaviours tends to increase these behaviours. Although the reprimand or threat may sometimes work in changing the child’s behaviour, in the long run, such strategies tend to increase problem behaviour. Strategies that are more likely to decrease problem behaviour in the long run include active ignoring and redirection (e.g., take a bite and then I will give you a hug), and
differential reinforcement of appropriate behaviours (e.g., sitting quietly, eating food). In some instances if problem behaviour continues, it may be necessary to implement a response cost procedure in that Robbie receives three warnings before losing a preferred activity.

5. **Proactively planning to prevent or overcome regressions with progress in the routine.**

Inevitably setting events will occur across that year that may disrupt progress in the routine. Major setting events relevant to the dinner routine include illness or a family vacation. To ensure the routine remains successful, while the setting event is occurring it is important to decrease your expectations on where, what, and how much Robbie eats. For example, while on vacation offer Robbie highly preferred foods (i.e., foods you are confident he will accept without any resistance). Once you return from vacation, use *behavioural momentum* to reestablish the dinner routine. Specifically, for the first few days after returning from vacation offer Robbie easy, preferred foods at dinner. The success you experience with Robbie will create momentum for Robbie accepting a more challenging food (i.e., a food he has not eaten in the past month). Additionally, to increase the likelihood of Robbie accepting the more challenging food, increase reinforcement during the dinner routine. For example, introduce intermittent treats during the meal or offer him a special activity he can earn contingent on eating his meal. These same strategies apply during times when Robbie has been ill.

6. **Accurately observing and evaluating one’s own behavior in relation to Robbie.**

One of the hardest things to do is accurately monitor and evaluate one’s own behavior. This is because in western society we are not taught to self-reflect on our behaviour. We are taught to think about our behaviour but not observe it. Accurately monitoring one’s own behavior also is especially difficult when one is busy, tired, sleepy, ill, or experiencing anxiety due to a life stressor (e.g., financial difficulties, family relations). During the dinner routine, it will be important to self-monitor and self-evaluate one’s own behavior to ensure that it is consistent with actions that help Robbie stay seated at the table and eat his dinner. For example, when you are sitting at the table with Robbie and observe him sitting quietly you need to self-monitor and self-evaluate the extent to which you praise Robbie and provide him with positive attention for these appropriate behaviours. When Robbie is refusing to eat, you need to self-monitor and self-evaluate whether you implemented the consequence procedures effectively. That is, did you ignore problem behaviours and calmly present the food until he accepts the bite? This self-monitoring and self-evaluating is essential if you wish to maintain the quality of implementation that has helped Robbie come to the table, stay seated for meals, and eat all of his food.

When regression occurs, use the implementation checklist to evaluate the use of strategies and how the plan might be implemented better or improved. The most common reason why behaviour support plans fail in the long run is that they succeed in the short term. When parents implement a plan that works, it is common to gradually, over time, stop using behavior support plan strategies. Within a few days, weeks, or months, enough support strategies have been suspended that the child no longer experiences proactive,
positive behavior support; rather, the child begins to re-experience the antecedent and consequent events that trigger and maintain problem behavior. When this happens, because it is not common to see the relationship between what we do and what our child does, it is more common for adults (be they professional or parents) to say that the plan no longer works. We remember that we used the plan and we have the idea that we are using positive behaviour support strategies. But because we have not self-monitored our actual behavior, we are not able to see how our actions gradually moved away from those consistent with support plan features. **The best solution to this common threat to the long-term use of plan strategies is to regularly self-monitor plan implementation.** The best way to do so is to use the implementation checklist at least once a week.

**Robbie’s Mastered Food List**

<table>
<thead>
<tr>
<th>Meat/Legumes</th>
<th>Vegetables</th>
<th>Fruits</th>
<th>Dishes/Pasta/Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>7. Teriyaki Beef</td>
<td>7. Yam Fries</td>
<td>7. Pasta with cream sauce with meat</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>8. Corn</td>
<td>8. Yoghurt</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>9. Chicken Noodle Soup</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10. Ham and cheese sandwich</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>11. Ratatouille</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>12. Boiled Egg</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>13. Chow Mein</td>
</tr>
</tbody>
</table>
**MAINTENANCE IMPLEMENTATION CHECKLIST**

**Date:**

<table>
<thead>
<tr>
<th>Strategies to Set the Stage for Success</th>
<th>Not in Place</th>
<th>Partially in Place</th>
<th>In Place</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. To ensure R was motivated to eat new foods I did the following:</td>
<td>1 2 3 4 5 NA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) I did not give R. food or drinks (except for water) 2-3 hours before a feeding session.</td>
<td>1 2 3 4 5 NA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) I limited R’s access to treats and preferred activities to only during and after dinner (e.g., chocolate, cookies, IPOD)</td>
<td>1 2 3 4 5 NA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) I rotated the reinforcers often</td>
<td>1 2 3 4 5 NA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d) I made sure R did not satiate on his preferred foods (i.e., eat all of his preferred foods) before eating his less preferred foods.</td>
<td>1 2 3 4 5 NA</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Strategies to Support a Successful Dinner Routine</th>
<th>Not in Place</th>
<th>Partially in Place</th>
<th>In Place</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. I showed R with a visual contingency what is expected of him and what he will get once he meets those expectations.</td>
<td>1 2 3 4 5 NA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. I offered R. choices (e.g., type of new food; number of bites, size of bites; type of food reinforcer; etc.)</td>
<td>1 2 3 4 5 NA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. With new foods, I gradually increased the amount of food he was expected to eat starting with pea-sized amounts and increasing to age-appropriate foods.</td>
<td>1 2 3 4 5 NA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. I used positive contingency statements to motivate R. to eat new foods. E.g., “one more bite and then you choose a treat”; “Take a big bite and you’ll get two M &amp; M’s”; sit in your chair and I will get your treats.</td>
<td>1 2 3 4 5 NA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. a) I offered praise and a bite of preferred food/drink contingent on R. meeting the desired expectation. For easy foods, I gave R. a treat after he finished the food. (b) For new/difficult foods, I gave R. a treat after every/every few bites. (c) For very difficult foods, I gave R. his treat as soon as he placed the difficult food in his mouth or I gave R. a bite of a preferred food as soon as he placed the difficult food in his mouth.</td>
<td>1 2 3 4 5 NA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. I remembered to praise R. frequently for good sitting. I used the motiviader if necessary.</td>
<td>1 2 3 4 5 NA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. I offered R. a preferred activity contingent on him consuming a specified number of bites or completing his meal. I remembered at the beginning of the meal to ask him what he would like to do after dinner.</td>
<td>1 2 3 4 5 NA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. I ignored all minor protests, or counter demands and redirected R. with meal-time</td>
<td>1 2 3 4 5 NA</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
related tasks (take a bite of food, tell me what treats you have today, take a sip of water etc.)

10. Once I made my request to take a bite of food, I remembered to continue to hold the bite of food up to R.’s mouth until he accepted the bite. If R. escalated into more severe behaviours (e.g., spitting, hitting, crying) I did not comment or give any disapproving looks. I simply kept presenting the demand to take a bite of food, while reminding him of what he will earn afterwards.

11. If R. tried to leave the table I blocked him from doing so. If R. is successful with leaving the table, I physically guided him back to his chair.

<table>
<thead>
<tr>
<th>Problem Behaviours</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5 or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Verbal Non-compliance</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5 or more</td>
</tr>
<tr>
<td>2) Turn head away/Pushing spoon away/closing mouth</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5 or more</td>
</tr>
<tr>
<td>3) Making counter demands</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5 or more</td>
</tr>
<tr>
<td>4) Aggression (e.g., hitting, biting)</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5 or more</td>
</tr>
<tr>
<td>5) Leaving table</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5 or more</td>
</tr>
<tr>
<td>6) Spitting</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5 or more</td>
</tr>
<tr>
<td>7) Throwing food</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5 or more</td>
</tr>
<tr>
<td>8) Crying/Yelling</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5 or more</td>
</tr>
</tbody>
</table>

**Strategies to Promote Long term Success With Dinner**

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I continued to present mastered foods at least once a month</td>
<td></td>
</tr>
<tr>
<td>2. I continued to introduce R. to new foods or new variations of previously mastered foods at least once a week.</td>
<td></td>
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<tr>
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<td></td>
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<tr>
<td>4. I reviewed this checklist once a week to self-monitor my use of the strategies.</td>
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<td>5. I remembered to be proactive to prevent or overcome setting events (e.g., illness, vacation)</td>
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<td>6. I remembered to stay calm in the midst of unanticipated problem behaviours</td>
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CONGRATULATIONS!! You have successfully transformed COERCIVE patterns of interaction (where your child’s problem behavior dictates how meal routines are conducted) to CONSTRUCTIVE patterns of interaction (where you guide your child through meals and TEACH him new skills and behaviors). To help you monitor your progress and MAINTAIN the improvements you’ve made, complete this checklist once each week.

<table>
<thead>
<tr>
<th>Dinner Routine</th>
<th>During dinner did Robbie engage in PROBLEM BEHAVIOR when you gave a demand/request?</th>
<th>Did you RESPOND to Robbie’s problem behavior by:</th>
<th>Did Robbie respond by REDUCING or STOPPING problem behavior?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>o Protest</td>
<td>o Delaying your request to come to the table</td>
<td>YES or NO</td>
</tr>
<tr>
<td></td>
<td>o Yell or Make Counter Demands</td>
<td>o Taking the non-preferred foods off his plate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o Cry</td>
<td>o Decreasing the number of bites you wanted him to eat or the size of bites</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o Scream/Tantrum</td>
<td>o Taking away the bite and allowing him to take a bite of a different food</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o Throw Items</td>
<td>o Offering a treat not previously planned to motivate or encourage him to eat the non-preferred food</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o Spit</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>o Leave table</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

IF YOU ANSWERED ‘YES’ TO ALL THREE QUESTIONS, YOU HAVE RETURNED TO A COERCIVE PROCESS. REVIEW THE PLAN AND IMPLEMENT ALL OF THE STRATEGIES TO MOVE BACK TO A CONSTRUCTIVE PROCESS. IF YOU STILL NEED HELP, CALL OR EMAIL LAUREN.
Below are several considerations and strategies for overcoming potential challenges to the maintenance of effective behaviour support with your son in the snack routine. Each consideration or strategy is based on what we all have learned about the things that might interfere with your continued progress and success together as a family. Each consideration and strategy represents things that are important for maintaining long-term improvements in child behaviour and your use of effective parenting practices. The purpose of the narrative below is to highlight these strategies and considerations so that they may continue to inform your child’s development and your excellent work as a parent for a very long time.

1. **Continuing to present foods on Josh’s “mastered list” at least once a month.**
   Given Josh’s long history of food refusal behaviour, the progress you have made in the past six months can easily unravel without continued maintenance support. One important component of maintenance support is keeping track of foods presented to Josh to ensure that all previously mastered foods are presented to him at least once a month. Without continuous presentation there is risk that Josh will drop foods from his diet or show more resistance the next time it is presented. Keeping a list of foods Josh has mastered in a convenient location that you can refer to daily can help you with maintaining the success you have achieved.

2. **Continuing to expose Josh to new foods or new variations of previously mastered foods.**
   Josh’s continued flexibility with trying new foods/new variations of mastered foods and incorporating them into his expanding diet is largely dependent on your behaviours. If you wish Josh to try new foods with minimal resistance than it is important that you continue to expose Josh to new foods on a regular basis (i.e., once every ten days).

3. **Continuing to present a new food that is initially challenging for Josh**
   Experience has shown that Josh’s initial resistance to a new food does not mean he definitively dislikes the food (e.g., apples, banana). With continuous exposure, that is, the food is presented regularly for a minimum of 10-15 times, Josh adjusts to the food’s texture, taste, and appearance and will begin to eat age appropriate portions in a suitable amount of time. Paying attention to this pattern will help you to work through any resistance and continue moving forward in expanding Josh’s diet.

4. **Continuing to vary what Josh eats at each meal to prevent boredom or satiation.**
   Although Josh has made amazing progress in his eating these past six months, it is important to understand that the change is still fragile. To ensure Josh continues to be motivated to eat foods from his mastered list it is important to vary his foods daily to prevent him from satiating on a food and subsequently showing resistance the next time the food is offered. A good indicator if Josh is becoming bored with a food is if after the food...
has been served a number of meals in a row, he starts to show resistance during subsequent presentations. Strategies to prevent boredom or satiation may include: (1) offering Josh a choice of foods to eat during a meal; (2) scheduling certain foods on certain days; and (3) continuing to expand his diet so there are more options for meals.

5. **Remembering to fade the use of treats during meals.**

As Josh’s eating improves with a new food (i.e., there is minimal resistance) it is important to fade the number of treats offered during meals. Long-term use of treats with new or difficult foods may increase the likelihood of Josh relying on treats to eat certain foods. This in turn might make it difficult for you to feed Josh such foods in certain contexts (community or school) for treats might not be available or permitted. Strategies to fade treats for eating certain foods includes the following:

1) Gradually decrease the ratio of bites to treats. For example: 6 almonds: 6 treats, fade to 6 almonds: 5 treats and so on.
2) Gradually increase expectations before Josh can earn the treat. For example, if the treat and bite of food are being presented simultaneously, fade to expecting Josh to chew five times before receiving treat, then fade to Josh swallowing the new food before earning the treat.
3) Decrease the number of treats offered at a meal or for a specific food. For example, fade from treats being offered intermittently through out a meal to Josh earning one larger treat at the end of the meal.

6. **Remembering to stay calm in the midst of unanticipated problem behaviours.**

For most children, focusing on minor problem behaviours tends to increase these behaviours. Although the reprimand or threat of punishment may sometimes work in changing the child’s behaviour, in the long run, such strategies tend to increase problem behaviour. Strategies that are more likely to decrease problem behaviour in the long run include active ignoring and redirection (e.g., take a bite and then I will tell you the answer), and differential reinforcement of appropriate behaviours (e.g., sitting quietly, eating food). In some instances if problem behaviour continues, it may be necessary to implement a minor punishment procedure in that Josh receives a warning that if he doesn’t eat his food in the next 5 seconds, you will add a bite to his plate.

7. **Proactively planning to prevent or overcome regressions with progress in the routine.**

Inevitably setting events will occur across that year that may disrupt progress in the routine. Major setting events relevant to the snack routine include illness or a family vacation. To ensure the routine remains successful, while the setting event is occurring it is important to decrease your expectations on where, what, and how much Josh eats.

For example, while on vacation offer Josh highly preferred foods (i.e., foods you are confident he will accept without any resistance). Once you return from vacation, use behavioural momentum to reestablish the snack routine. Specifically, for the first few days after returning from vacation offer Josh easy, preferred foods at meals (e.g., peanut butter on cracker). The success you experience with Josh will create momentum for Josh accepting a more challenging food (e.g., vegetables). Additionally, to increase the likelihood of Josh accepting the more challenging food, increase reinforcement during the
snack routine. For example, introduce intermittent treats during the meal or offer him a special activity he can earn contingent on eating his meal. These same strategies apply during times when Josh has been ill.

8. **Accurately observing and evaluating one’s own behavior in relation to Josh.**

   One of the hardest things to do is accurately monitor and evaluate one’s own behavior. This is because in western society we are not taught to self-reflect on our behaviour. We are taught to think about our behaviour but not observe it. Accurately monitoring one’s own behavior also is especially difficult when one is busy, tired, sleepy, ill, or experiencing anxiety due to a life stressor (e.g., financial difficulties, family relations). During the snack routine, it will be important to self-monitor and self-evaluate one’s own behavior to ensure that it is consistent with actions that help Josh stay seated at the table and eat his food. For example, when you are sitting at the table with Josh and observe him sitting quietly you need to self-monitor and self-evaluate the extent to which you praise Josh and provide him with positive attention for these appropriate behaviours. When Josh is refusing to eat, you need to self-monitor and self-evaluate whether you implemented the consequence procedures effectively. That is, did you ignore problem behaviours and calmly present the food until he accepts the bite? Self-monitoring and self-evaluating is essential if you wish to maintain the quality of implementation that has helped Josh come to the table, stay seated for meals, and eat all of his food.

   **When regression occurs, use the implementation checklist to evaluate the use of strategies and how the plan might be better implemented or improved.** The most common reason why behaviour support plans fail in the long run is that they succeed in the short term. When parents implement a plan that works, it is common to gradually, over time, stop using behavior support plan strategies. Within a few days, weeks, or months, enough support strategies have been suspended that the child no longer experiences proactive, positive behavior support; rather, the child begins to re-experience the antecedent and consequent events that trigger and maintain problem behavior. When this happens, because it is not common to see the relationship between what we do and what our child does, it is more common for adults (be they professional or parents) to say that the plan no longer works. We remember that we used the plan and we have the idea that we are using positive behaviour support strategies. But because we have not self-monitored our actual behavior, we are not able to see how our actions gradually moved away from those consistent with support plan features. **The best solution to this common threat to the long-term use of plan strategies is to regularly self-monitor plan implementation. The best way to do so is to use the implementation checklist at least once a week.**
<table>
<thead>
<tr>
<th>Meat/Legumes</th>
<th>Vegetables</th>
<th>Fruits</th>
<th>Dishes/Pasta/Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Fish Sticks</td>
<td>1. Carrots</td>
<td>1. Apple</td>
<td>1. Peanut Butter on Cracker</td>
</tr>
<tr>
<td>5. Tofu Breakfast patties</td>
<td>5.</td>
<td></td>
<td>5. Cheese Stick</td>
</tr>
<tr>
<td>9. Cherry Tomato</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
MAINTENANCE IMPLEMENTATION CHECKLIST  
Snack Routine  
Josh  

Date: ____________________________  

<table>
<thead>
<tr>
<th>Strategies to Set the Stage for Success</th>
<th>Not in Place</th>
<th>Partially in Place</th>
<th>In Place</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. To ensure J. was motivated to eat new foods I did the following:</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>a) I made sure he was hungry. I checked his blood sugar prior to snack and if low, I gave him easy highly preferred foods to start.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>b) I limited J’s access to reinforcers (e.g., chocolate treats, cookies, preferred toys)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>c) I rotated the reinforcers often</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Strategies to Support a Successful Snack Routine</th>
<th>Not in Place</th>
<th>Partially in Place</th>
<th>In Place</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2. I showed J. with a visual contingency how many bites he is expected to eat and when he will earn his treats. For new foods I remembered to show him he can have a treat after the first bite.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>3. I offered J. choices (e.g., type of new food; number of bites, size of bites; type of food reinforcer; how many bites with a peanut butter)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4. For new foods I gradually increased my expectations starting with having him eat very small bites. Once J. was successfully eating small bites of food, I gradually increased the number of bites and the size of bite. If the bite is too large I offered to cut it in half for J., with each half representing half the bite of food.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5. For new foods, I paired the new food with a highly preferred food/reinforcer. E.g., I put peanut butter on the apple/banana, Rolled the banana with sprinkles or allowed him to eat the bite of food and the treat simultaneously. I faded the highly preferred food/reinforcer gradually. For example, I alternated bites with peanut butter with bites without; OR, I faded to having J. chew five times before he can have the treat.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>6. I used positive contingency statements to motivate J. to eat new foods. E.g., “one more bite and then you have another bite of cookie”; “five chews and then you can have your treat;” “chew and swallow your food and then you have a treat;”</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>7. I reminded J. before snack that if he needed a break to just ask. I honoured his requests by giving him a short, timed break.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>7. I offered praise and a bite of preferred food</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
contingent on J. meeting the desired expectation.

8. I offered J. a preferred activity contingent on him consuming a specified number of bites or completing his meal.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>NA</th>
</tr>
</thead>
</table>

9. If minor problem behaviours occur (e.g., silly behaviours, gagging, covering mouth) I actively ignored and redirected J. to take a bite of food or prompted him to ask for a break.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>NA</th>
</tr>
</thead>
</table>

10. If major problem behaviours occurred (e.g., spitting out food, turning head away, throwing food, screaming, crying, running away from the table) I did the following:
   a) I ignored all behaviours, I did not comment or give any disapproving looks.
   b) I continued to present the bite of food and every 30 seconds requested Josh take a bite. I also at this time kept reminding him of the contingency, “if you want me to play later/eat X, you need to eat”
   c) Once Josh accepted the food I praised compliance.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>NA</th>
</tr>
</thead>
</table>

Problem Behaviours

1) Food Refusal (turning head away, covering mouth, saying no, disgusting etc.)

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5 or more</th>
</tr>
</thead>
</table>

2) Spitting or Spitting out Food

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5 or more</th>
</tr>
</thead>
</table>

3) Leaving Table

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5 or more</th>
</tr>
</thead>
</table>

4) Throwing items/knocking things over

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5 or more</th>
</tr>
</thead>
</table>

5) Screaming/Crying

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5 or more</th>
</tr>
</thead>
</table>

6) Silly Behaviours

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5 or more</th>
</tr>
</thead>
</table>

Foods Offered and Portion Size

1)
2)
3)

Strategies to Promote Long term Success With Snack

<table>
<thead>
<tr>
<th></th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
</table>

1. I continued to present mastered foods at least once a month

2. I continued to introduce J. to new foods or new variations of previously mastered foods at least once a week.

3. For foods that were initially challenging for J. I remembered that it can take Josh up to 10-15 exposures with a new food before he may develop a preference for that food. With this in mind, I continued to present the food to Josh many times, very soon after the initial presentation.

4. I continued to vary what Josh eats at each meal to prevent boredom or satiation.

5. I remembered to fade the number of treats offered for new foods.

6. I reviewed this checklist once a week to self-monitor my use of the strategies.

7. I remembered to be proactive to prevent or overcome setting events (e.g., illness, vacation)

8. I remembered to stay calm in the midst of unanticipated problem behaviours
CONGRATULATIONS!! You have successfully transformed COERCIVE patterns of interaction (where your child’s problem behavior dictates how meal routines are conducted) to CONSTRUCTIVE patterns of interaction (where you guide your child through meals and TEACH him new skills and behaviors). To help you monitor your progress and MAINTAIN the improvements you’ve made, complete this checklist once each week.

<table>
<thead>
<tr>
<th>Snack Routine</th>
<th>During snack did J engage in PROBLEM BEHAVIOR when you gave a demand/request?</th>
<th>Did you RESPOND to J.’s problem behavior by:</th>
<th>Did J respond by REDUCING or STOPPING problem behavior?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>o Protest</td>
<td>o Delaying your request to come to the table</td>
<td>YES or NO</td>
</tr>
<tr>
<td></td>
<td>o Cry</td>
<td>o Taking the non-preferred foods off his plate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o Cover mouth or turn away</td>
<td>o Decreasing the number of bites you wanted him to eat or the size of bites</td>
<td>YES or NO</td>
</tr>
<tr>
<td></td>
<td>o Throw Items</td>
<td>o Taking away the bite and allowing him to take a bite of a different food</td>
<td>YES or NO</td>
</tr>
<tr>
<td></td>
<td>o Spit</td>
<td>o Offering a treat not previously planned to motivate or encourage J to eat the non-preferred food</td>
<td>YES or NO</td>
</tr>
<tr>
<td></td>
<td>o Leave table</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

IF YOU ANSWERED ‘YES’ TO ALL THREE QUESTIONS, YOU HAVE RETURNED TO A COERCIVE PROCESS. REVIEW THE PLAN AND IMPLEMENT ALL OF THE STRATEGIES TO MOVE BACK TO A CONSTRUCTIVE PROCESS. IF YOU STILL NEED HELP, CALL OR EMAIL LAUREN
APPENDIX I

The University of British Columbia
Office of Research Services
Behavioural Research Ethics Board
Suite 102, 6190 Agronomy Road, Vancouver, B.C. V6T 1Z3

CERTIFICATE OF APPROVAL - MINIMAL RISK RENEWAL

PRINCIPAL INVESTIGATOR:
Joseph M. Lucyszyn

DEPARTMENT:
UBC/Education/Educational & Counselling Psychology, and Special Education

UBC BREB NUMBER:
H07-01599

INSTITUTION(S) WHERE RESEARCH WILL BE CARRIED OUT:

<table>
<thead>
<tr>
<th>Institution</th>
<th>Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>UBC</td>
<td>Vancouver (excludes UBC Hospital)</td>
</tr>
<tr>
<td>Other locations where the research will be conducted:</td>
<td>Subject's home</td>
</tr>
</tbody>
</table>

CO-INVESTIGATOR(S):
Lauren Binnendyk

SPONSORING AGENCIES:
N/A

PROJECT TITLE:
Expanding the Unit of Analysis and Intervention for Children with Developmental Disabilities and Food Refusal Behaviour

EXPIRY DATE OF THIS APPROVAL: July 28, 2009

APPROVAL DATE: July 28, 2008

The Annual Renewal for Study have been reviewed and the procedures were found to be acceptable on ethical grounds for research involving human subjects.

Approval is issued on behalf of the Behavioural Research Ethics Board

Dr. M. Judith Lynam, Chair
Dr. Ken Craig, Chair
Dr. Jim Rupert, Associate Chair
Dr. Laurie Ford, Associate Chair
Dr. Daniel Salihani, Associate Chair
Dr. Anita Ho, Associate Chair