Mealtime Behaviour among Children with Disabilities: Family Interactions and Stress

By

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Abstract

Feeding problems may disrupt the developmental benefits of positive mealtime interactions. Despite the high prevalence of feeding problems in young children, particularly those with developmental disabilities, research on the impact of these problems on caregiver-child interactions is scant. Study 1 involved an online caregiver questionnaire to compare the impact of feeding problems on parent stress, negative mealtime interactions and mealtime socialisation across typically developing children (n = 225) and children with developmental disabilities (n = 68). The impact of aspects of the mealtime environment (mealtime socialisation, feeding problems, parent stress and parent control of eating) on negative mealtime interactions was also explored. The impact of feeding problems on parent stress was greater for caregivers of children with developmental disabilities than for caregivers of typically developing children. Mealtime aggression and food refusal were significant predictors of parent stress across typically developing children and children with a developmental disability. The presence of developmental disabilities and the presence of high levels of feeding problems both resulted in an increase in negative mealtime interactions. Mealtime socialisation, parent stress, parent control of eating and feeding problems (in particular mealtime aggression and food refusal) were significant predictors of negative mealtime interactions. Neither developmental disabilities nor high levels of feeding problems impacted on levels of mealtime socialisation. Further consideration of the measure of mealtime socialisation indicated that this may not have measured the intended construct, therefore a second study was developed. Study 2, an observational analysis of video recordings of family mealtimes among typically developing children (n = 4) and
children with a developmental disability (n = 4), provides an in-depth analysis of the impact of feeding problems on the proportions of both social and directive interactions that occur between caregivers and children, as well as a thematic analysis of more qualitative aspects of tone and focus. Developmental disabilities and/or feeding problems may give rise to mealtime interactions that are focused on feeding rather than social and learning opportunities. Implications of the findings for interventions to maximize positive caregiver-child mealtime interactions are explored, along with the study limitations and recommendations for future research.
CHAPTER 1
INTRODUCTION AND OVERVIEW OF THESIS STRUCTURE

Feeding problems are common among young children, affecting 25% to 35% of those who are typically developing (Benjasuwantep, Chaithirayanon, & Eiamudomkan, 2013; Linscheid, 2005) and up to 80% of children considered to have a developmental disability (Gal, Hardal-Nasser, & Engel-Yeger, 2011; Manikam, & Perman, 2000). The nature of these problems differs significantly between children, ranging from severe food selectivity and refusal, requiring medical intervention, to disruptive mealtime behaviours (Luiselli, 1989). Relatively little research has been undertaken into how feeding problems influence the positive interpersonal interactions that commonly take place during mealtimes and the focus of the limited available research has been on severe feeding disorders (Atzaba-Poria et al., 2010) rather than on more typical and more transient feeding problems, such as disruptive mealtime behaviours.

Considering the numerous social and developmental benefits of mealtimes (Kok, 2015; Spagnola & Fiese, 2007) and the significant amount of time children spend eating (Baxter, 2007), the paucity of research regarding the influence of feeding problems on positive mealtime interactions is surprising. The high prevalence of feeding problems and disruptive mealtime behaviours in children with developmental disabilities (Burklow, Phelps, Schultz, McConnell, & Rudolph, 1998), together with their increased learning needs and vulnerabilities, provide a particular rationale for investigating the possible impact of feeding problems on positive family mealtime environments in this population.

Research has shown that feeding problems are associated with negative caregiver-child interactions (Atzaba-Poria et al., 2010; Lindberg,
Bohlin, Hagekull, & Palmérus, 1996), which are likely to impede the positive interplay that encourages child development and learning. A number of caregiver characteristics have been found to be associated with negative mealtime interactions, with indications that parent characteristics may play a greater role in caregiver-child interactions than the characteristics of the child (Drew, 2004; Toyama & Muto, 1990). Caregivers of children with feeding problems have been found to display high levels of stress and high levels of controlling feeding practices (Adams, Gordon, & Spangler, 1999), which are both thought to have a negative impact on positive mealtime interactions. However, relatively little research has been conducted into the influence of feeding problems on mealtime interactions.

It has also been shown that among children with developmental disabilities (Ferm, Ahlsén, & Björck-åkesson, 2012) and feeding problems (Harding, Wade & Harrison, 2013), mealtimes are dominated by directive caregiver interactions and may be focused on caregiving aspects of feeding rather than the social aspects of mealtimes. These findings suggest that children with feeding problems may be missing out on the learning opportunities that mealtimes provide, and this is important for children with developmental disabilities who require additional time to acquire and practise skills through repetition and encouragement in everyday situations (Horn, Lieber, Sandall, Schwartz, & Wolery, 2002).

**Organisation of Thesis**

Following this overview, Chapter 2 provides a review of the literature as the basis of a study to extend our understanding of mealtime behaviours and
interactions between children with developmental disabilities and their caregivers. The chapter opens with a brief definition and description of developmental disabilities in the Australian context, followed by information regarding the importance of utilising everyday environments and interactions to encourage child development. An overview of the benefits of family mealtimes is provided, followed by a description of feeding problems and their impact among families of typically developing children. This provides a foundation for the current study to focus on children with developmental disabilities. A summary of common feeding problems among children with developmental disabilities is provided, as well as what is known about levels of parent stress related to feeding problems, caregiver feeding styles, and mealtime interactions in this population.

Chapter 3 provides details of the methods employed in Study 1. The overarching aims of Study 1 were to compare the impact of feeding problems on: 1) parent stress; 2) negative mealtime interactions; and 3) mealtime socialisation across a sample of typically developing children and a sample of children with developmental disabilities, and to investigate how aspects of the mealtime environment (mealtime socialisation, feeding problems, parent stress and parent control of eating) impact on negative mealtime interactions. Specifically, this study explores: which types of feeding problems predict parent stress, and whether the relationship between types of feeding problems and parent stress differs between caregivers of children with developmental disabilities and children who are typically developing; and which factors of the mealtime environment contribute to negative mealtime interactions and whether the relationship between factors of the mealtime environment and negative
mealtime interactions differs between caregivers of children with developmental disabilities and children who are typically developing.

A cross-sectional on-line questionnaire was designed to achieve these aims. The instruments section of the Methods chapter includes an assessment of the reliability of the Mealtime Behaviour Questionnaire (Berlin et al., 2010), whereby the correlation of each item with the total score was assessed and Cronbach’s alphas were calculated for the total mealtime behaviour score and for each individual subscale.

The results from the 293 participants (225 caregivers of typically developing children and 68 caregivers of children with developmental disability) who completed the online questionnaire in Study 1 are presented in Chapter 4. This chapter includes results from six two-way analyses of variance, two standard multiple regressions and eight moderating regressions. Further consideration of the mealtime socialisation measure used in Study 1 indicated that this measure may not have captured all aspects of mealtime socialisation which were considered to be important in the current study, therefore a second study was developed.

Chapter 5 describes the methodology of Study 2, an observational investigation with a qualitative component and involving analysis of video recordings of mealtimes in eight families (four families of typically developing children and four families of children with a developmental disability). The overarching aim of Study 2 was to explore, in more detail, how feeding problems impact on the development and socialisation opportunities that can occur during mealtimes within families of typically developing children and families of children with developmental disabilities. Specifically, this involves a
focus on the proportions of both social and directive interactions that occur between caregivers and their children, as well as a thematic analysis of more qualitative aspects of tone and focus. The results of Study 2 are presented as Chapter 6. This chapter includes a detailed analysis of the nature of mealtime interactions of both caregivers and typically developing children and caregivers and children with developmental disabilities, including children with both high and low levels of feeding problems in each.

Chapter 7, the final chapter, provides an integrated discussion of the findings from Study 1 and Study 2, including their contribution to the knowledge base regarding the impact of feeding problems among typically developing children and children with developmental disabilities. This chapter includes discussion of the impact of developmental disabilities and feeding problems on parent stress, negative mealtime interactions and mealtime socialisation; the impact of various types of feeding problems (food refusal, mealtime aggression, food manipulation and choking/gagging and vomiting) on parent stress and negative mealtime interactions; and the impact of the mealtime environment (mealtime socialisation, parent stress, feeding problems, parent control) on negative mealtime interactions. The observational findings from Study 2 regarding the incidence of, and themes evident within, social and directive mealtime interactions between caregivers and children are discussed.

This chapter concludes with consideration of the implications of the thesis findings for theory, research and intervention in the area of feeding problems among typically developing children and children with developmental disabilities. The limitations of the study are discussed and recommendations for future research are provided.
The terms parent and caregiver are often used interchangeably within the literature, therefore both are used within this thesis. However, the term caregiver is used in preference to the term parent. This is in line with international trends and aims to capture the diverse relationships between children and their primary caregivers; such as step-parents, grandparents and adoptive parents.
Disability and Developmental Delay

According to The World Health Organization’s International Classification of Functioning, “disability” is a broad term which refers to “any or all of an impairment of body structure or function, a limitation in activities or a restriction in participation” (World Health Organization [WHO], 2001). In the State of Victoria, Australia, disability is more specifically described as: (a) a sensory, physical, neurological impairment or acquired brain injury that is expected to be permanent and causes significantly reduced capacity in at least one of the following areas; self-care, self-management, mobility or communication; or (b) an intellectual disability or (c) a developmental delay (The Victorian Disability Act; 2006). Intellectual disability is diagnosed when an individual above the age of 5 years, who shows significant below-average general intellectual functioning coexisting with significant deficits in adaptive behaviour, with both deficits presenting before the age of 18 years (Disability Act, 2006). In contrast, a mental and/or physical impairment of a child under the age of 6 is termed a developmental delay. A developmental delay is characterised by significant functional limitations in one or more of the following developmental domains: self-care, receptive language, expressive language, cognitive development or motor development; and that the needs of the child and family require coordinated support and care from an interdisciplinary team (Disability Act, 2006). For the purpose of this thesis the collective term ‘developmental disability’, will be used to refer to both children with disabilities and children with developmental delays. Reported
rates of disability appear to increase across childhood, with higher rates of
disability reported among older children (Australian Bureau of Statistics
[ABS], 2012). Statistics released by the ABS indicate that 3.6% of children
(3.7% of boys and 3.5% of girls) aged between birth and 4 years have a
developmental disability, with rates increasing to 8.8% among children aged
between 6 and 14 years (ABS, 2012). Differences in type of disability are
reported across age. Among children with a disability up to 4 years of age,
63% were diagnosed with a sensory or speech disability, 35% with a physical
disability and 29% with an intellectual disability. In contrast, among children
aged between 4 and 15 years of age, 37% were diagnosed with a sensory or
speech disability, 27% with physical disability and 61% were diagnosed with
an intellectual disability (ABS, 2009). These trends may be influenced by
difficulties in securing a formal diagnosis in young children with disabilities,
particularly those with an intellectual disability, owing to ongoing
developmental changes, the absence of defining characteristics in some
disabilities, and the difficulties inherent in engaging and formally assessing
young children.

Children with developmental disabilities are a heterogeneous group
whose characteristics and needs vary considerably from each other. It is
accepted, however, that their support requirements are additional to those of
other children and they may require special attention in order to flourish and
enjoy fulfilling lives (Moore, 2011). The importance of providing all children
with natural learning opportunities which occur in the context of everyday
family routines coupled with responsive and sensitive caregiving has been
highlighted in recent Australian and international early childhood literature
McWilliam, 2010). This is of particular importance to children at risk of developmental delays, who may require additional interventions to maximise their potential (McWilliam).

**Ideal Learning Environments**

The first few years of a child’s life are a particularly sensitive period, providing a scaffold for cognitive, behavioural, social and emotional development (Yi-Juin, 2009). It is now well established that the provision of early intervention to children with developmental disabilities enhances the likelihood that they will reach their full developmental potential (Moore, 2011). Recommended early intervention strategies include using everyday routines as opportunities for children to learn and practise new skills through interactions with the environment, including their family, peers, toys and equipment (McWilliam, 2010). Early intervention practice also emphasises building caregiver confidence and competence to take full advantage of learning opportunities that arise though their child’s participation in the everyday environment, both at home and in the community (McWilliam; Trivette, Dunst, & Hamby, 2004). Following a review of literature, Moore (2011) concluded that it is vital that children are provided with repeated opportunities to practice developmentally appropriate skills in everyday situations with the ongoing support of attuned and responsive caregivers. Compared to their typically developing peers, children with developmental disabilities are likely to need additional time to acquire and practise skills through repetition, reinforcement and encouragement in order to maximise their learning from everyday opportunities (Horn et al., 2002).

The relationships that children have with their caregivers impact significantly on their development. For children to maximize everyday
learning opportunities, the interactions between them and their caregivers need to be sensitive, sincere, responsive, communicative and non-intrusive (Moore, 2010). These quality interactions are important for all children, including those with developmental disabilities. According to Bronfenbrenner (1992), the activities that make up daily life can either be development-enhancing or development-impeding, depending on particular characteristics and features of the activity. Children’s learning opportunities are enhanced when the child is interested, engaged, growing in skills and ability, when they have a sense of achievement, and when parenting styles and instructional practices are responsive to child initiated behaviour and give children the opportunity to practise and build on their skills (Dunst, 2005; Guralnick, 2005).

The wellbeing and emotional states of both parents and their children are thought to play a major role in the quality of their interactions. For example, it has been proposed by Arnold and O’Leary (1995) that positive affect in children encourages adult responsivity, whereas a negative affect may result in adults disengaging or being punitive in their responses. Likewise, adults with intact wellbeing are more likely to interact with their children in a positive and supportive way (Dunst & Trivette, 1988), while those with stress or depression may be unresponsive or interact in inconsistent ways (Beardslee, Versage, & Gladstone, 1998; Herwig, Wirtz, & Bengel, 2004). Obviously when parents and children both display positive affect, they mutually engage and optimise the benefits from positive interactions (Feldman, Greenbaum, & Yirmiya, 1999; Kochanska & Aksan, 1995; Tronick, Ricks, & Cohn, 1982).

It thus appears that learning and development in young children is enhanced through the social interactions and experiences presented to them in everyday routines (Dunst, Hamby, Trivette, Raab, & Bruder, 2000). A high
proportion of a child’s day is spent eating or being fed. According to Baxter (2007), Australian children aged 4 to 5 years spend 9.6% of their time eating, surpassed only by sleep (46.6%) and organized lessons/activities (10.0%). The significant amount of time that families devote to mealtimes suggests that mealtimes provide a rich natural learning environment crucial to child socialisation and development.

**Benefits of Mealtime Interactions**

Family mealtimes provide a range of opportunities for children to develop socially, psychologically and developmentally. Historically, mealtimes have been viewed as occasions where family values and traditions are passed on, relationships strengthened and social and cultural norms are modelled (Beals, 2001; Kok, 2015). Mealtimes foster relationships and emotional connectedness and provide learning opportunities that encourage independence and facilitate progress across fine motor, social-emotional and language domains (Spagnola & Fiese, 2007; Lora, Sisson, DeGrace, & Morris, 2014).

Family mealtimes play a role in developing a sense of family connectedness and the routine surrounding family meals promotes a sense of belonging and emotional security among young children (Fiese, Foley, & Spagnola., 2006; Kok., 2015). Family mealtimes provide an opportunity for parents to share family memories and history. Children who are knowledgeable about their family history, commonly acquired through mealtime discussions and other interactions, tend to report higher self-esteem, a greater sense of control and closer relationships with family members (Eisenberg, Olsen, Neumark-Sztainer, Story, & Bearinger, 2004). According to Herot (2002), mealtime interactions are important in socialising children to
appropriate affect. The socialisation of affect is a multifaceted process which involves parents helping their children to grow in their understanding of empathy, to understand their own emotions and to express emotions in a culturally acceptable way. Herot analysed transcripts of mealtime conversations among families of children aged between 3 and 5 years and reported that mealtimes were laden with both verbal and non-verbal affective inputs, affectively loaded topics were frequent and parents consistently conveyed affective values to their child, both explicitly and implicitly.

The benefit of family mealtimes on language development has been a particular focus of research. In a longitudinal study of 65 families over a period of 15 years, Snow and Beals (2006) demonstrated that mealtime conversations allowed children to practise and develop verbal communication skills including learning new vocabulary, producing and comprehending stories, acquiring general knowledge and learning how to talk in culturally appropriate ways. According to Beals (1997), mealtime conversations expose young children to a range of words which would not commonly be expected in their vocabulary, these words were used in an informative way which enabled children to elicit meaning. In Beal’s study, preschool children who were frequently introduced to novel words in a meaningful way during mealtimes had larger vocabularies at age 5 and at age 7 than children who had been exposed to novel words less frequently. Similar finding were reported by Weizman and Snow (2001) in an investigation of the use of sophisticated words (i.e., those not included in the 3,000 most commonly used words) by mothers across a range of settings including mealtimes, playtime and when reading books to their child. Mothers were reported to use sophisticated vocabulary more frequently during mealtimes than in any other setting. On the
basis that increased use of unfamiliar words increases future vocabulary (Weizman & Snow), these findings suggest that mealtimes offer rich opportunities for language development.

Mealtime conversations are not limited to exchanges about the actual mealtime itself. Topics discussed have been shown to commonly include conversations about friends and family members, commenting on the past and planning for the future (Beals & Snow, 2002; Davidson & Snow, 1996). Extending mealtime conversations beyond the here and now by allowing time for story-telling, descriptions, discussions and questioning has the potential to promote the development of insight, social confidence, problem solving, concept building and the forming of opinions (Aukrust & Snow, 1998; Beals, 1993; Lora et al., 2014; Ochs, Taylor, Rudolph, & Smith, 1992).

As demonstrated in the literature, family mealtimes offer an array of opportunities for children to socially connect and develop interpersonal and feeding skills. This may be of greater significance for children with developmental disabilities who commonly require frequent and repeated opportunities to practice and acquire new skills (Dunst et al., 2000). The high prevalence of feeding problems among children with developmental disabilities and the impact these may have on mealtime interactions, however, may place them at risk of missing out on the benefits of these natural learning opportunities.

**Feeding Problems among Young Children**

According to the Diagnostic and Statistical Manual of Mental Disorders, Version 5 (DSM-5), feeding and eating disorders are characterised by a persistent disturbance of eating or behaviours related to eating, which result in the altered consumption or absorption of food and significantly impair
physical health or psychosocial functioning (American Psychiatric
Association, 2013). Pica, rumination disorder, and avoidant/restrictive food
intake disorder, are considered to be feeding and eating disorders that generally
occur within infancy or early childhood (American Psychiatric Association,
2013).

However, the DSM-5 diagnostic criteria for eating and feeding disorder
does not fully capture the range of feeding problems that can present in
childhood, such as choking and gagging or disruptive behaviour during
mealtimes (Powell, Farrow, & Meyer, 2011). Although disruptive mealtime
behaviours are considered to be sub-threshold of a clinical diagnosis, they are
highly prevalent among children with developmental disabilities and impact
considerably (Burklow, Phelps, Schultz, McConnell, & Rudolph, 1998).
Herein the term ‘feeding problems’ will therefore extend beyond the DSM-5
definition to include the range of feeding, eating and mealtime difficulties that
can present during childhood.

Parental reports of feeding problems among young children usually
indicate prevalence rates of between 20% and 30% (Benjasuwantep et al.,
2013; Kodak & Piazza, 2008; Linscheid et al., 2003), with severe feeding
problems being noted in 3% to 10% of children (Dahl & Sundelin, 1992;
Esparó et al., 2004; Reau, Senturia, Lebailly, & Christoffel, 1996). Feeding
problems appear heightened among children with developmental disabilities,
with prevalence figures ranging from 30% to 80% (Kerwin, Eicher, &
Gelsinger, 2005; Kodak & Piazza) and with a more recent study indicating
such problems in as many as 97% of children with developmental disabilities
(Gal et al., 2011). In addition to an overall increased prevalence in this
population, particular types of developmental disabilities, such as Autism Spectrum Disorders (Kerwin et al., 2005; Martins et al., 2008; Williams, Gibbons, & Schreck, 2005), Cerebral Palsy (Reilly & Skuse, 1992) and Down syndrome (Collins et al., 2003) are more commonly associated with feeding problems. Importantly, the prevalence of feeding problems in the early years differs significantly between studies, depending on the specific population sampled, how feeding problems are defined and the age of the children studied. These variances make it difficult to compare studies and to conceptualise the prevalence and classification of feeding problems.

Feeding problems can arise and be maintained by a variety of organic and non-organic factors (Luiselli, 1989). Non-organic factors are characterized by environmental aspects of feeding and eating, such as parenting styles, parent-child interactions and behaviour mismanagement (Luiselli), whereas organic factors that contribute to feeding problems are defined by their biological or anatomical characteristics. These include physiological abnormalities (e.g., cleft palate), neuromuscular deficits (e.g., cerebral palsy), physical disease and metabolic disorders (e.g., gastrointestinal disease) (Didden, Seys, & Schouwink, 1999; Luiselli). Considering the high prevalence of these factors among children with developmental disabilities, it is not surprising that an increased incidence of feeding problems is observed in this population (Schwarz, 2003; Williams et al., 2005).

Both typically developing children and children with developmental disabilities display a diverse array of feeding problems. Children may present with a single mealtime problem or they may present with a complex combination of problems in response to both organic and non-organic factors
Most commonly, children who are typically developing display transient and intermittent feeding problems related to the development of self-feeding skills and the introduction of new foods (O'Brien, Repp, Williams, & Christophersen, 1991). Children with developmental disabilities, however, can display less transient, more severe and a more diverse range of feeding problems. These can be classified into the following categories:

**Limited Food Intake.** Some children simply consume very limited quantities of food with the potential to cause malnourishment or nutritional deficiency, while others display food selectivity or food refusal (Luiselli, 1989; Mari-Bauset, Zazpe, Mari-Sanchis, Llopis-Gonzalez, & Morales-Suarez-Varela, 2013). Food selectivity involves extremely limited food preferences and often refusal to consume particular textures or tastes (Williams et al., 2005). Children with an Autism Spectrum Disorder, frequently show high levels of food selectivity and often show limited preferences in regard to food textures (Ahearn, Castine, Nault, & Green, 2001; Bandini et al., 2010; Hubbard, Anderson, Curtin, Must., & Bandini, 2014; Kerwin et al., 2005; Provost, Crowe, Osbourne, McClain, & Skipper, 2010; Sharp et al., 2013; Williams et al., 2005). Food refusal is characterised by refusal to consume some or most foods, with outcomes ranging from relatively minor behavioural difficulties to severe refusal requiring medical intervention (Williams, Field, & Seiverling, 2010).

**Rate of food intake.** Children with food pacing difficulties, present with either rapid food consumption or extremely slow food consumption. Those who eat rapidly do not always chew or swallow their food adequately, leading to an increased risk of choking or the development of gastrointestinal
problems (Beighley, Matson, Rieske, & Adams, 2013). Children who consume food too slowly often do not eat an adequate amount when under time constraints (Luiselli, 1989).

**Choking, gagging and coughing.** Choking, gagging and coughing are often a result of Dysphasia, which is a persistent problem among children with oral motor delays (Gisel, 2008; Williams, Hendy, & Knecht, 2008). For example, up to 90% of children with Cerebral Palsy display some degree of oral motor dysfunction (Reilly, Skuse, & Poblete, 1996) and children with Down Syndrome often present with hypotonia and associated oral motor problems (Spender et al., 1996).

**Vomiting and rumination.** Vomiting and rumination are considered to be distinct from involuntary regurgitation and are thought to be voluntary in nature. Vomiting involves the regurgitating of food that has previously been swallowed and rumination involves the re-chewing and re-swallowing of regurgitated food (Rajindrajith, Devanarayana, & Crispus Perera, 2012). Children who display vomiting and rumination are at risk of becoming dehydrated, malnourished and under-weight. Children with learning disabilities are thought to be particularly prone to rumination (Cooper & Stein, 2006). In addition, research has highlighted a high prevalence of gastro-oesophageal abnormalities and reflux in this population (Rogers, Stratton, Victor, Kennedy, & Andres, 1992), suggesting that some cases of rumination have an organic cause.

**Disruptive mealtime behaviour.** Disruptive mealtime behaviour may consist of tantrums, throwing food, screaming and refusing to stay seated. Disruptive mealtime behaviours are often considered to be a secondary feature
of many other feeding problems (Luiselli, 1989). For example, a child who has limited food intake may also exhibit disruptive mealtime behaviours such as aggression and spitting out food. There is evidence to suggest that up to 85% of children with developmental disabilities display disruptive mealtime behaviours associated with feeding problems (Burklow, Phelps, Schultz, McConnell, & Rudolph, 1998). Disruptive mealtime behaviours often cause parents considerable stress (Greer, Gulotta, Masler, & Laud, 2008; Secrist-Mertz, Brotherson, Oakland, & Litchfield, 1997) and may exacerbate negative parent-child interactions (Luiselli, 1989).

**Negative Mealtime Environment and Interactions**

Mothers of children with feeding problems report decreased levels of mealtime enjoyment, an increase in mealtime arguments and an overall negative mealtime atmosphere (Johnson & Harris, 2004; Mascola, Bryson, & Agras, 2010; van der Horst, 2012). These findings are particularly concerning given the importance of positive parent-child interactions in child development (Dunst et al., 2001), as well as the many benefits beyond nutrition that mealtimes have to offer (Snow & Beals, 2006).

Although it is not possible to assume causality or the directionality of any relationships, numerous studies have demonstrated associations between infant feeding disorders and negative parent-child interactions (Atzaba-Poria et al., 2010; Feldman, Keren, Gross-Rozal, & Tyano, 2004). For example, mothers of children with feeding disorders have been found to be less inclined to initiate physical touching, more likely to stay out of reach of their child and less receptive to their child’s touch than mothers of children without feeding
problems (Feldman et al., 2004). Similarly, mothers of children with feeding disorder have been reported to show more negative affect and intrusiveness than mothers of children without such problems (Stein, Woolley, Cooper, & Fairburn, 1994). A more recent examination of the relationship between parents and their children demonstrated that both mothers and fathers of children with non-organic failure to thrive had less positive interactions with their children than the control group (Atzaba-Poria et al., 2010). On the other hand, it has been proposed that severe feeding disorders, such as non-organic failure to thrive, can be the result of a relational disturbance (Satter, 1990), making it difficult to determine the extent to which these disruptions in interactions occurred before or after the onset of the feeding problem.

Studies of infants with more typical and transient feeding problems, however, have also shown an association between negative mealtime environments and negative maternal emotions regarding feeding (Johnson & Harris, 2004; Hagekull & Dahi, 1987). According to Hagekull and Dahi, in comparison to mothers of children without feeding problems, mothers of children with feeding problems reported more negative feelings towards the feeding situation, including nervousness and sadness. Mealtimes were more frequent and longer-lasting, with the children being described as irritated and tense (Hagekull & Dahi). Similarly, Johnson and Harris found that mealtime negativity was related to poor food acceptance, with mealtime negativity showing a significant correlation with food refusal and food neophobia (an unwillingness to try new food). Without implying causation, these results lend support to the contention that feeding problems in children are associated with negative mealtime environments and interactions.
In addition, significant differences in mealtime interactions have been reported from comparisons of reports from parents of picky eaters and non-picky eaters (Burnier, Dubois, & Girard, 2011; Mascola et al., 2010; van der Horst, 2012). Parents of picky-eaters report that mealtimes were less frequently pleasant, with less frequent opportunity to speak. They experienced more mealtime struggles with their child, more arguments between their children and more arguments with each other about their child’s eating habits (Burnier et al., 2011; Mascola et al., 2010). Similarly, van der Horst (2012) reported a high correlation between picky eating and decreased eating enjoyment, with eating enjoyment explaining 33% of the variance in picky eating. These studies of children considered to be picky eaters indicate a strong link between feeding problems and a negative mealtime environment. Little information was provided regarding the prevalence of children with developmental disabilities in these samples, however, despite the high incidence of feeding problems in this population. Burnier et al. (2011) and Mascola et al. (2010) used longitudinal study designs and, although original eligibility criteria excluded children with obvious illness or disability, there is no information regarding the emergence of disabilities as the children developed.

Within the literature, feeding problems displayed by children with ASD have been found to have a negative impact on family mealtime interactions (Ausderau & Juarez, 2013; Bagby, Dickie, & Baranek, 2012; Marquenie, Rodger, Mangohig, & Cronin, 2011; Suarez, Atchison, & Lagerwey, 2014). Marquenie et al. (2011) conducted interviews, regarding family routines and rituals, with mothers (N = 14) of children with ASD, many of which displayed food selectivity and mealtime behaviour difficulties. Ninety two percent of
mothers did not report that mealtimes encompassed meaningful positive interactions. Although some mothers reported trying to integrate pleasant or meaningful interactions into mealtime routines, they noted that opportunities were limited due to the focus on their child with ASD (Marquenie et al., 2011). In support of this Bagby et al. (2012) reported that for families of children with ASD, mealtimes were focused on specific meal preparation and food selectivity which resulted in decreased opportunities for meaningful mealtime experiences. However, these studies did not allow for comparison with families on typically developing children and focused on the impact of ASD on mealtime interactions, rather than the impact of feeding problems.

In summary, noticeable differences have been reported among families, in regards to the mealtime environment, which suggest that mealtimes in households with children who have feeding problems are commonly marked by a negative atmosphere, more arguments and less positive mealtime interactions. However, many of these studies do not report the incidence of developmental disability in the samples, leaving a knowledge gap in how feeding problems are impacting on the tone of mealtime interactions in this cohort. Owing to the high incidence of feeding problems in this population, it is entirely possible that negative mealtime environments are impeding or depriving children of the developmental and social opportunities that mealtimes offer. Despite the high incidence and diverse range of feeding problems in children with developmental disabilities (Burklow, Phelps, Schultz, McConnell, & Rudolph, 1998), there is little information regarding the type of feeding problems associated with negative mealtime interactions. This presents as an important area for further investigation.
As feeding is an interactional process, the role that caregivers play in the mealtime environment is equally, and possibly more important, than the characteristics of the child (Drew, 2004). Parents of children with feeding problems (Adams et al., 1999; Didehbani, Kelly, Austin, & Wiechmann, 2011; Garro, Thurman, Kerwin, & Ducette, 2005) and parents of children with developmental disabilities (Baker et al., 2003; Britner, Morog, Pianta, & Marvin, 2003; Davies & Carter, 2008; Estes et al., 2009; Fidler, Hodapp, & Dykens, 2000; Hayes & Watson, 2013; Johnston et al., 2003) have been reported to have high levels of parent stress. While parent stress may arise in part from their child’s mealtime difficulties, it is also possible that high levels of parent stress are contributing to increased negative mealtime interactions and decreased opportunities for learning. To understand the role that parent stress plays in negative mealtime interactions, it is necessary to first gain some understanding of the levels of stress experienced by caregivers of children with both a developmental disabilities and feeding problems.

**Parent Stress**

It has been shown in separate areas of research that parents of children with developmental disabilities and parents of children with feeding problems display increased levels of overall parental stress. There is, however, a paucity of specific research into the levels of stress experienced by parents of children with developmental disabilities and feeding problems. Considering the high prevalence of feeding problems among children with developmental disabilities, it is important to gain an understanding of the extent to which the presence of a child with feeding problems may be influencing levels of parent
stress, and how, this in turn, may impact on the opportunity during mealtimes for positive interactions and developmental learning opportunities for the child.

In a limited literature, parents of young children with feeding problems and co-morbid conditions (developmental or medical) have been shown to display rates of stress that approach clinical significance, at a level that requires therapeutic intervention (Fishbein, Benton, & Struthers, 2014; Pagano, 2000). Considering the array of literature which separately links feeding problems and developmental disabilities to increased levels of parent stress, these results are not surprising.

Inconsistent results have been reported from the two studies in which the cumulative impact of co-morbid feeding problems on parental stress in parents of children with developmental or medical conditions have been investigated. Fishbein et al. (2014) reported that parents of children with a feeding disorder and a co-morbid medical or developmental condition reported higher levels of parental stress than parents of children with feeding disorder alone. In contrast, Adam et al. (1999) reported that levels of maternal stress did not differ significantly between mothers of children with both developmental disabilities and feeding problems and mothers of children with developmental disabilities alone. The mothers of children with developmental disabilities and feeding problems did however show increased levels of stress and it is possible that the relatively small sample size ($N=32$) contributed to a lack of significance. Additionally, Adams et al. used a sample of children aged between 5 and 17 years, whereas Fishbein et al. (2014) used a sample of children aged between 2 and 6 years. It is possible that older children are more independent, and that less parent stress is associated with lower responsibility for feeding.
Although findings are limited, it is clear that caregiver of children with both developmental disabilities and feeding problems are at risk of experiencing substantial levels of stress. It remains unclear, however, whether caregivers of children with developmental disabilities and feeding problems are experiencing significantly increased levels of stress compared to parents of children with developmental disabilities or feeding problems alone. Additionally, it is not clear how disruptive mealtime behaviour impacts on parent stress within this cohort. Considering that increased parent stress has been shown to be associated with negative developmental outcomes for children (Cowen, 1998; Deater-Deckard & Scarr, 1996; Powers et al., 2002; Turner et al., 1994), there is an imperative for research to be undertaken to further investigate these relationships in the context of family mealtimes.

**Types of Feeding Problems and Parent Stress**

Different types of feeding problems and concerns have been associated with increased stress in parents of children with both a developmental disability and feeding problems. These include concerns regarding swallowing and nutrition (Sullivan et al., 2000), the presence of tube feeding (Adams et al., 1999), oral motor dysfunction and tonal abnormalities (Garro et al., 2005). The focus of the available studies has predominantly been on the more complex and physically determined feeding problems displayed by children with developmental disabilities. As noted by Greer et al. (2008) and Secrist-Mertz et al. (1997), the stress caused by feeding problems of a behavioural nature in children with mild disabilities may be overlooked, with research and interventions predominantly focussing on the complex feeding problems displayed by children with more severe disabilities. The impact of seemingly milder, more behaviourally based feeding problems has not been as widely
considered. In particular, the high prevalence of disruptive mealtime behaviour problems and the secondary role they can play in feeding problems, suggests the importance of increased attention (Luiselli, 1989).

Although few in number, some studies have demonstrated links between high frequencies of behavioural feeding problems and increased levels of parental stress in children with developmental disabilities. Greer et al. (2008), for example, reported that behavioural feeding problems contributed to parental stress more so than the presence of Autism or Pervasive Developmental Disorder. Furthermore, the presence of behavioural feeding problems successfully predicted higher levels of parental stress even among tube and liquid dependent children. Similarly, Secrist-Mertz et al. (1997) reported positive correlations between the frequency of behavioural feeding problems and reported levels of parental stress. Of interest, children with milder disabilities were more likely to demonstrate behavioural feeding problems and higher levels of parental stress than children with more severe disability (Secrist-Mertz et al., 1997).

In the studies by both Greer et al. and Secrist-Mertz et al., however, a range of behavioural feeding problems (e.g., choking, vomiting, food refusal, disruptive behaviour) were combined to produce a single mealtime behaviour score. It is therefore not possible to distinguish the relative contribution of different types of behavioural feeding problems on parent stress in these samples. There remains a need to separate different types of feeding problems to determine their relative contribution to parent stress and in particular to include a focus on the challenges faced by caregivers of children who display behavioural feeding problems, such as disruptive mealtime behaviours.
It is important to note the potential bi-directionality of the link between parent stress and behavioural feeding problems. Specifically, behavioural feeding problems lead to increased parent stress, which subsequently leads to ineffective behaviour management and increased behavioural feeding problems (Anthony et al., 2005; Neece et al., 2012). Although this is beyond the scope of this review, it is an important factor to consider when exploring the link between parent stress and behavioural feeding problems, as parent stress may be an important target when implementing interventions for behavioural feeding problems.

Effects of Stress on Caregiver-Child Interactions

It is critical that caregiver-child interactions are filled with positive, sensitive and reciprocal interactions in order to maximise learning opportunities (Dunst et al., 2001). In this next section, the literature on the impact of parent stress on positive caregiver-child interactions is reviewed. It appears that parental stress influences the well-being of both parents and their children. Specifically, high levels of parental stress can impact negatively on parent-child interactions, potentially leading to negative developmental outcomes in young children (Cowen, 1998; Deater-Deckard & Scarr, 1996) and a reduction in the positive outcomes available from natural learning environments (Powers et al., 2002; Turner, Sanders, & Wall, 1994).

In an exploration of the critical role of parent stress in caregiver-child interactions McKay, Pickens, and Stewart (1996) studied 46 parent-child dyads (3-14 year olds). Parents were observed engaging in a number of tasks with their child including singing, drawing pictures and reading stories. On average, parents with higher stress levels were rated significantly lower with regards to the quality of parent-child interactions than parents with normal
levels of stress. More specifically, interactions involving parents with higher levels of stress had higher levels of negative affect and less positive responsivity. This research lends support to the suggestion that high levels of parent stress may adversely influence caregiver-child interactions.

A strong link between stress and negative interactions in a mealtime setting, however, has yet to be clearly demonstrated. In a non-clinical study of four year old children, Drew (2004) sought to establish if parenting stress was associated with difficult parent-child mealtime interactions, such as parents being more demanding, parents being more controlling or children being more disruptive. Drew’s study included an extensive questionnaire administered to 224 families, followed by mealtime observations of a smaller sample of 20 families; 10 with high levels of daily stress and 10 with low levels of daily stress. From the findings, the authors concluded that successful mealtime interactions were more linked to parental behaviours than to child characteristics. More specifically, mothers with high levels of reported daily stress had significantly less frequent and less positive mealtime conversations with their child than those with lower levels of daily stress. These findings support the suggestion that parent stress may be impacting negatively on mealtime interactions; however, the sample was limited to typically developing children. Considering the increased stressors facing caregivers of children with developmental disabilities and feeding problems, this is obviously a critical area for undertaking research.

**Parent Stress and Feeding Styles**

Parent stress has been shown to be associated with an increase in feeding practices that are controlling in nature (Mitchell, Brennan, Hayes, & Miles, 2009; Woolfson & Grant, 2006). These practices are also thought to
contribute to negative mealtime interactions. This area of research is increasingly complex as it is unclear if parent stress is resulting in controlling parenting styles, or if controlling parenting styles are leading to increased parent stress. Although this relationship may be bi-directional, it is important to understand how these factors relate to each other and how they influence mealtime interactions.

Mitchell et al. (2009) examined parent factors involved in feeding styles, finding that parents who reported high levels of stress, anxiety or depression were less satisfied in their parental role and used higher levels of an authoritarian style of feeding, including feeding restriction and pressure to eat. In a similar study, Woolfson and Grant (2006) compared the relationship between parenting styles and parenting stress among a sample of children with developmental disabilities and typically developing children. Parents of children with developmental disabilities reported higher levels of parental stress, with a relationship demonstrated between authoritative parenting and parent stress. Woolfson and Grant suggest that parents of children with developmental disabilities may find it difficult to implement authoritative parenting styles due to disability factors, limited success and the need for increased repetition, possibly causing increased parental stress. It thus remains unclear whether parent stress is leading to increased use of controlling parenting styles or whether controlling parenting styles are leading to increased parent stress.

**Controlling Caregiver Practices**

Ideally, mealtime interactions involve a responsive and sensitive caregiver, who is attuned to their child’s level of feeding ability and their
child’s communicative cues (Satter, 1990). When this ideal feeding relationship is disrupted, as it may be in a situation where the child displays feeding problems, caregivers may be inclined to dominate or control mealtime interactions. There is some research evidence that controlling interactions during mealtimes may arise from caregivers becoming overly concerned with their child’s nutritional intake (Davies et al., 2006) or from a lack of readable cues from their child (Barnard & Kelly, 1990). Although limited research has been conducted regarding caregiver pressure and control, specifically among children considered to have developmental disabilities, there has been more extensive research focused on children displaying feeding problems irrespective of the presence of co-morbid developmental disabilities (Galloway, Fiorito, Francis, & Birch, 2006; Galloway, Fiorito, Lee, & Birch, 2005; Webber, Cooke, Hill, & Wardle, 2010). This research has highlighted the presence of disordered mealtime interactions commonly displayed between caregivers and children with feeding problems. Although the focus of these studies was predominantly on the potential role of disruptive parent-child interactions in exacerbating or maintaining feeding problems, the results nonetheless support the suggestion that children with feeding problems may be missing out on positive aspects of mealtimes that may be, at least in part, due to controlling parental feeding practices.

Limited research has been conducted on the impact of controlling mealtime practices among typical children. However, the use of parental control and particularly pressure to eat, appears to be ineffective in promoting intake of food and is likely to lead to negative child reactions. In a study conducted by Galloway et al. (2006), soup intake in a pressed and non-
pressured condition was measured in a sample of 27 typical children. Interestingly, there was no difference in food intake across the two conditions. Over time, however, the children in the pressured condition displayed a decreased willingness to eat. In addition, they made significantly more negative comments such as “I hate it” and “I don’t want to drink it” (157 comments) compared to children in a no pressure condition (30 comments).

Although the authors make little note of these results, they support the proposal that increased parental control regarding feeding may result in negative mealtime interactions. These results are similar to those found among samples of children displaying food refusal and support suggestions that interactions between controlling caregivers and their infants may become cyclic. That is, caregivers respond to food refusal with increased pressure that can subsequently result in increased food refusal.

According to Webber et al. (2010), parental pressure to eat was associated with low levels of food enjoyment in typically developing girls aged between 7 and 9 years. Van der Horst (2012) reported similar results in a sample of children with high food pickiness (n=305) compared to their counterparts with low food pickiness. Caregivers of children with high food pickiness reported lower levels of eating enjoyment and higher levels of controlling practices, such as restriction and pressure. Eating enjoyment, however, appeared to be a mediating factor in the association between food pickiness and pressure to eat. These findings suggest that eating enjoyment may have a more significant impact on food pickiness than controlling feeding styles, highlighting the association between enjoyable mealtime environments and feeding behaviours.
Similarly, in comparison to mothers of typically developing children, mothers of children with food refusal have been shown to use more verbal teaching/control and show less sensitivity and cooperation when interacting with their child (Lindberg et al., 1996). It appears that these patterns are similar in a sample of mothers and fathers of children (n=67) with feeding disorders (Atzaba-Poria et al., 2010). Parents of children with a feeding disorder had less positive mealtime interactions with their child compared to parents of healthy children (Atzaba-Poria et al.). Mothers of children with feeding disorders showed less sensitivity, less structure and more intrusive behaviour when compared to mothers of healthy children (Atzaba-Poria et al.).

In summary, parent control regarding feeding appears related to negative mealtime interactions and potentially plays a role in exacerbating feeding problems. Further research is needed to elucidate the role that a controlling feeding style plays in mealtime environments among children with feeding problems.

**Directive Mealtime Interactions**

According to both clinical reports and empirical studies, mealtimes present distinct and often narrow communication possibilities for children with feeding problems and developmental disabilities (Bailey, Harms, & Clifford, 1983; Morris, 1981). For these children, management of mealtime behaviour, feeding assistance and safety issues may become the focus of mealtime interactions, thereby limiting positive communication possibilities. As mealtime environments are thought to aid in the development of language, social and functional skills among typically developing children (Spagnola &
Fiese, 2007), it is important to consider the implications of feeding problems on these interactions among children with both feeding problems and developmental disabilities. While caregivers of children with feeding problems may show increased levels of control regarding feeding, they may also dominate mealtime conversations, resulting in decreased opportunities for their child to practise language and communication skills (Harding, Wade & Harrison, 2013; Veness and Reilly 2007).

This appears to be particularly true among children with disabilities such as cerebral palsy, as they often display some level of feeding impairment, as well as communication difficulties. In a study undertaken by Veness and Reilly (2007), mothers of children with cerebral palsy dominated mealtime interactions and provided more directions and communication than their children, regardless of the severity of their child’s eating impairment. On average, mothers contributed 70.7% of all mealtime interactions, producing more than double the number of communicative acts than their child. Olrick, Pianta and Marvin’s (2002) study of interactions in families of children with cerebral palsy aged between 17 and 54 months similarly indicated that the child’s degree of feeding difficulty (as measured by degree of motor impairment) did not influence caregiver-child interactions. On average, children signalled to their caregivers for caregiving purposes significantly more often than they signalled for social reasons. It is suggested from these results that among, children with cerebral palsy, mealtimes are focused on caregiving rather than on the social benefits that mealtimes offer. However neither of these studies included a typically developing comparison group,
making it difficult to determine how these caregiver-child interactions differ from those among families of typically developing children.

In a series of observational studies, the mealtime interactions between a pre-school aged child with cerebral palsy and her caregiver were compared with a dyad involving a typically developing child (Ferm et al., 2005, 2012). For the child with cerebral palsy and her caregiver, the natural mode of communication at mealtime usually did not require communication aids. Although un-related topics were briefly introduced, conversations were generally focused on immediate feeding issues. In contrast, interactions between the typically developing child and her caregiver included conversations regarding a variety of personal topics that extended beyond the present mealtime issues including past and future events and regarding people who were not present. While these results highlight the vast differences in mealtime interactions, the case study design limits the generalisability of the findings.

A similar pattern of mealtime interactions among typically developing children with early feeding problems was reported by Harding, Wade and Harrison (2013). The caregivers of these children were observed to use more language to manage their child’s mealtime behaviour than caregivers of children with no history of early feeding problems. Although again limited by a small sample size (n=6), this study provides preliminary evidence that caregivers of children with feeding problems communicate differently during family mealtimes than those whose children have no history of feeding problems. In particular, it appears that mealtimes for children who have feeding problems are commonly dominated by caregiver interactions and are
focused on caregiving aspects of feeding rather than the social opportunities potentially available during mealtimes.

**The Current Research**

This review and analysis of the literature provides initial support for the proposal that children with feeding problems may be missing out on the social and developmental opportunities that mealtimes offer. The findings are particularly relevant to children with developmental disabilities who show a high incidence of feeding problems and who need to maximise their opportunities for learning and development. It remains unclear, however, whether mealtime interactions differ in families of children with developmental disabilities compared with families of typically developing children, and how feeding problems within these populations impact on parent stress, negative mealtime interactions and mealtime socialisation.

The overarching aims of Study 1 are represented by the following key questions:

1. **Parent Stress.**

   **Aim 1a.** What is the impact of feeding problems on the level of stress reported by caregivers and does this differ between caregivers of children with developmental disabilities and caregivers of typically developing children?

   **Aim 1b.** Which types of feeding problems predict parent stress and does the relationship between types of feeding problems and parent stress differ between caregivers of children with developmental disabilities and caregivers of children who are typically developing?
2. **Negative Mealtime Interactions.**

   **Aim 2a.** What is the impact of feeding problems on negative mealtime interactions reported by caregivers and does this differ between caregivers and their children with developmental disabilities and caregivers and their typically developing children?

   **Aim 2b.** Which factors of the mealtime environment contribute to negative mealtime interactions and does the relationship differ between caregivers of typically developing children and caregivers of children with a developmental disability?

3. **Mealtime Socialisation.**

   **Aim 3.** What is the impact of feeding problems on mealtime socialisation reported by caregivers and does this differ between caregivers of children with developmental disabilities and caregivers of typically developing children?

   Further consideration of the mealtime socialisation subscale of Toddler-Parent Mealtime Behaviour Questionnaire (Archer, Rosenbaum, & Streiner, 1991) indicated that this measure may not have captured aspects of mealtime socialisation which were considered to be important in the current study. A second study (Study 2) was subsequently developed to explore the impact of developmental disability and of feeding problems on mealtime socialisation via the systematic analysis of video recordings of mealtimes at the family home. Study 2 included a thematic analysis of the nature of mealtime interactions between both caregivers and typically developing children and
caregivers and children with developmental disabilities, including children with both high and low levels of feeding problems in each.

The aim of Study 2 has two linked components (thesis aim 4) and is represented by the following question:

Aim 4a. Does the proportion of directive and social interactions displayed between children and caregivers during mealtimes differ across families?

Aim 4b. On the basis of analysis of thematic content, does the tone and focus of directive and social interactions displayed between children and caregivers during mealtimes differ across families?

It is anticipated that the findings of this thesis will inform the delivery of early childhood intervention services. In particular, the findings may support the promotion of opportunities in the natural learning environment created during mealtimes. If the aetiology of negative mealtime environments can be more thoroughly understood it may help professionals and families to create mealtime environments that are positive for all concerned and importantly, conducive to maximising learning and developmental outcomes in the child.
CHAPTER 3

STUDY 1 METHODS

Participants

The participants in this study were 293 adults who identified as primary caregivers of children aged between 1 and 6 years. Primary caregivers in this sample were comprised of 46 males (15.7 %) and 245 females (83.6 %). The questionnaire was available online and thus participants were from a range of countries: 28 (9.6%) chose not provide their location, 161 (54.6%) were from Australia, 75 (25.6%) were from The United States of America, 15 (5.1%) were from Canada, 3 (1.4%) were from New Zealand, with 11 from other countries (Germany, India, Republic of Korea, Malaysia, Poland, Portugal, South Africa). It should be noted that the vast majority of subjects were from western countries, with similar cultural norms.

In 287 cases (98.0%), caregivers specified their relationship with the identified child as a biological parent, with 2 cases each identifying as adoptive parents and grandparents (0.7% respectively) and one identifying as a step parent (0.3%). The primary caregivers provided information regarding 293 children comprised of 176 males (60.1%) and 113 females (38.6%), with gender not reported in 4 cases (1.3%).

Of the 293 children, 225 (76.8%) were described as typically developing (131 males; 90 females) and 68 (23.2%) had an identified disability (45 males: 23 females). Specific primary diagnoses and areas of difficulty are presented in Table 3.2, with the majority of children diagnosed with an Autism Spectrum Disorder.
Child disability diagnosis and area of developmental delay.

Table 3.1 displays the disability diagnosis and the areas of developmental delay for children with a disability, across high and low feeding problems groups.

Table 3.1

Disability Diagnosis and Areas of Developmental Delay of Participants with Disability across High and Low Feeding Problems Groups.

<table>
<thead>
<tr>
<th>Child Characteristics</th>
<th>Low Feeding Problem n=14</th>
<th>High Feeding Problem n=54</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnosed Disability n=68</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Autism Spectrum Disorder (n=34)</td>
<td>3</td>
<td>31</td>
</tr>
<tr>
<td>Global Developmental Delay (n=11)</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>Specific Developmental Delay (n=8)</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Down Syndrome (n=5)</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Other Chromosomal Abnormality (n=5)</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Cerebral Palsy (n=4)</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Attention Deficit Hyperactive Disorder (n=1)</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Area of Difficulty</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personal, Emotional &amp; Social Skills (n=59)</td>
<td>9</td>
<td>50</td>
</tr>
<tr>
<td>Language Skills (n=47)</td>
<td>12</td>
<td>35</td>
</tr>
<tr>
<td>Fine Motor Skills (n=38)</td>
<td>10</td>
<td>28</td>
</tr>
<tr>
<td>Learning and Thinking Skills (n=33)</td>
<td>6</td>
<td>27</td>
</tr>
<tr>
<td>Gross Motor Skills (n=23)</td>
<td>7</td>
<td>16</td>
</tr>
</tbody>
</table>

Note: multiple “Areas of Difficulty” reported for some children.
**Low and high feeding problem groups.** The total score from the Mealtime Behaviour Questionnaire (MBQ) was used to separate the sample into a high and low feeding problem group (refer to Materials section for more detail on this instrument and its use in determining the level of feeding problems).

Of the 293 total children, 146 (49.8%) were identified with high feeding problems (93 males; 50 females) and 147 (50.2%) with low feeding problems (83 males; 63 females). As displayed in Table 3.1, 59.1% ($n = 133$) of the 225 participants in the typically developing group were allocated to the low feeding problem group and 40.9% ($n = 92$) were allocated to the high feeding problem group. Of the 68 participants in developmental disability group 20.6% ($n = 14$) were allocated to the low feeding problem group and 79.4% ($n = 54$) were allocated to the high feeding problem group. These distributions are consistent with the prevalence of feeding problems among samples of typically developing children and samples of children with a developmental disability (Gal, Hardal-Nasser, & Engel-Yeger, 2011; Lindberg, Bohlin, & Hagekull, 1991).

**Child age.** Means, standard deviations, and range of age across disability and typically developing groups, with low and high feeding problems are displayed in Table 3.2.

As can be seen, the mean age of children is higher in the disability groups, in particular the group that also has feeding difficulties. A One-Way Analysis of Variance, with post-hoc analyses, revealed that children in the Disability High Feeding Problem group were significantly ($p < .010$) older than children in the Typically Developing group with both Low and High
Feeding Problems. On the basis that typically developing children often experience less feeding problems as they develop, it is possible that the impact of feeding problems is also likely to reduce with age in this group (Benjasuwante, Chaithirayanon, & Eiamudomkan., 2013). This may make any differences observed in this older group more significant in comparison to the other groups or possibly may signal that the feeding problems may be more entrenched in the children in this group.

Table 3.2

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>%</th>
<th>M</th>
<th>SD</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developmental Disability High Feeding Problems</td>
<td>54</td>
<td>18.7</td>
<td>4.5</td>
<td>1.4</td>
<td>1.8 – 6.9</td>
</tr>
<tr>
<td>Developmental Disability Low Feeding Problems</td>
<td>13</td>
<td>4.5</td>
<td>4.2</td>
<td>1.5</td>
<td>2.1 – 6.8</td>
</tr>
<tr>
<td>Typically Developing High Feeding Problems</td>
<td>91</td>
<td>31.5</td>
<td>3.4</td>
<td>1.6</td>
<td>1.0 – 6.8</td>
</tr>
<tr>
<td>Typically Developing Low Feeding Problems</td>
<td>131</td>
<td>45.3</td>
<td>2.9</td>
<td>1.5</td>
<td>1.0 – 6.9</td>
</tr>
</tbody>
</table>

Instruments

The data was collected via a caregiver self-report questionnaire, available in both paper and online format. The 107 item questionnaire consisted of forced option questions, open ended questions, multiple choice questions and Likert scaled items. In addition to demographic and mealtime questions, a range of questions were sourced from a number of established
measures of childhood mealtime behaviour, family mealtime interactions and parental stress.

**Demographic information.** Questions regarding the diagnosis of a disability or developmental delay followed a similar question structure, including a yes/no response, followed by an open ended question. Questions relating to child’s age, number of siblings and child’s birth order, required participants to fill in a numerical response, for example, “How many siblings does this child have?” Two options “male” and “female” were provided for report of the gender of both the caregiver and the child. Multiple options were provided for report of the caregiver’s relationship to the child.

**Mealtime difficulties information.** Questions relating to the mealtime difficulties of children required a simple yes/no response, followed by an open ended question, for example “Does this child have mealtime difficulties? If yes, please outline below”.

**The Parenting Stress Index – Short Form** (PSI-SF; Abidin, 1995). The PSI-SF was used to evaluate the level of stress that caregivers perceive as being associated with their role as a parent. The PSI/SF is a 36 item self-report measure (rather than 120 item in the PSI – Long form), that yields three subscales, each consisting of 12 items, with a total parent stress score comprised of all 36 items. The Total Parent Stress Score is designed to give an indication of the stress that a parent is experiencing in their role as a parent rather than general life stress (Abidin, 1995). The three sub-scales include:

- Parental Distress (PD), which measures a parent’s perception of their personal competence as a parent, conflict with their child’s other parent, stress associated with restrictions on their life, depression and social support.
- Parent-Child Dysfunctional Interaction (P-CDI), measures the extent to which parents believe that their child is meeting their expectations and parent satisfaction in interactions with their child. High scores (above the 90th percentile) may indicate that the parent feels disappointed or rejected by their child, potentially resulting in a lack of parental warmth or a reluctance to initiate interactions with their child (Abidin, 1995).

- Difficult Child (DC), which measures how easy or difficult a parent perceives his/her child to be. In younger children (under 18 months) high scores (above the 90th percentile) may indicate that the child is having difficulty with self-regulatory processes (feeding and sleeping). In older children (above 2 years of age) high scores may indicate that the parent is finding it difficult to manage their child’s behaviour.

Two items from the P-CDI subscale (item 14 and 34) and one item from the Difficult Child subscale (item 36) are reverse scored. Participants are asked to respond to various statements related to parenting and indicate which answer came closest to how they feel, typically parent responses were rated using a 5-point Likert Scale, with responses ranging from 1 to 5 (strongly agree, agree, not sure, disagree, strongly disagree). Items include, “Sometimes my child does things just to bother me to be mean” (P-CDI), “My child makes more demands on me than most children” (DC) and “I feel trapped by my responsibilities as a parent” (PD).

The instrument is scored by summing the total of 12 items for each subscale; subscale scores cannot be calculated when two or more responses have been skipped. Each subscale has a maximum possible score of 60. The Total Parent Stress Score is calculated by summing scores for the 36 items,
with a maximum possible score of 180. High scores on the PSI/SF represent lower levels of parent stress; low scores represent high levels of parent stress. For the purpose of this research all scores were reverse scored so that high scores represent high levels of parent stress and low scores represent lower levels of stress.

Abidin (1995) reports that the PSI-SF has acceptable levels of validity and reliability. Cronbach’s alpha reliability coefficients suggest high internal consistency (Total Stress $\alpha = .91$, PD $\alpha = .87$, P-CDI $\alpha = .80$, DC $\alpha = .85$) with scores derived from the PSI/SF correlating highly with relevant aspects of the full length PSI (Abidin, 1995). The PSI-SF has proven to be reliable, and valid within a range of cultures and populations including caregivers of children with developmental disabilities (Fishbein et al., 2014; Greer et al., 2008; Martin, Dovey, Coulthard, & Southall, 2013).

Table 3.3

*The Cronbach’s Alphas for the total, and subscales of the PSI-SF*

<table>
<thead>
<tr>
<th>Scale</th>
<th>Developmental Disability</th>
<th>Typically Developing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parent Distress</td>
<td>.91</td>
<td>.86</td>
</tr>
<tr>
<td>Difficult Child</td>
<td>.89</td>
<td>.88</td>
</tr>
<tr>
<td>Parent Child Dysfunctional Interaction</td>
<td>.83</td>
<td>.78</td>
</tr>
<tr>
<td>Total Parent Stress Index</td>
<td>.93</td>
<td>.91</td>
</tr>
</tbody>
</table>
In the current study Cronbach’s alphas for the total and subscale scores are listed in Table 3.3. A minimum alpha coefficient of .70 was applied to benchmark adequate internal reliability (Field, 2013). These values are above accepted levels and suggest good internal reliability for the measure.

**Toddler-Parent Mealtime Behaviour Questionnaire** (TPMBQ; Archer, Rosenbaum, & Streiner, 1991). Aspects of the mealtime environment were measured using the TPMBQ, a 35 item self-report measure that was adapted from the Children’s Eating Behaviour Inventory (Archer, Rosenbaum, & Streiner, 1991), with the aim of developing a culturally sensitive measure of toddler-parent mealtime feeding behaviours. The TPMBQ yields 6 subscales: Mealtime Socialisation, Mealtime TV Watching, Caregiver Distress During Mealtime, Parent Role in Toddler Feeding, Toddler Decides and Toddler Food dislikes and likes. One of the six subscales – Mealtime Socialisation was administered in this study. The Caregiver Distress, Mealtime TV Watching and Toddler Food Dislikes and Likes subscale’s were removed as they were not relevant to the aims of this research and the Parent Role in Toddler Feeding and Toddler Decides subscales were removed as the Feeding Strategies Questionnaire (Berlin, Davies, Silverman, & Rudolph, 2011) was used to measure this construct. Participants were required to respond to statements regarding mealtime interactions and indicate how often these behaviours occur according to a 5 point Likert scale with responses ranging from 0 to 5 (never, rarely, sometimes, often, always).

- The Mealtime Socialisation subscale assesses the frequency and quality of socialisation during family mealtimes. It consists of eight items, including
statements such as “I sit down with my child at meals” and “My child gets my full attention during meals”. In order to establish cross validity of this self-report questionnaire, the results from subscales were compared to results from an observational version of this measures, titled: Toddler-Parent Mealtime Behaviour Observations. The self-report Mealtime Socialisation subscale showed moderate cross validity with the observational measure.

The TPMBQ has been used by a number of authors to assess mealtime behaviour among toddlers (Horodynski & Stommel, 2005; Horodynski, Stommel, Brophy-Herb, Xie, & Weatherspoon, 2010; Horodynski, Stommel, Brophy-Herb, & Weatherspoon, 2010). In the current study Cronbach’s alphas for the Mealtime Socialisation subscale scores are listed in Table 3.4. The values are above accepted levels ($\alpha > .70$; Field, 2013) and suggest good internal reliability for the measure.

Table 3.4

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Developmental Disability</th>
<th>Typically Developing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mealtime Socialisation</td>
<td>.80</td>
<td>.79</td>
</tr>
</tbody>
</table>

**About Your Child’s Eating Questionnaire** (AYCE; Davies, Ackerman, Davies, Vannatta, & Noll, 2007). The AYCE is a 20 item self-report measure of negative mealtime interactions that yields three scales: Parent Aversion to Mealtime, Positive Mealtime Environment and Child Resistance to Eating. Participants are asked to respond to statements regarding
mealtime interactions with their child, their feelings regarding mealtimes and the frequency of mealtime behaviours displayed by their child. They are also asked to indicate how often certain events occur during family evening mealtimes. Responses are rated on a 5-point Likert scale, with responses ranging from 1 to 5 (never, sometimes, once in a while, often, nearly every time).

Although the AYCE provides an overall measure of Family Relationship Disturbance by calculating the average score across all three subscales, this was not considered to be an appropriate measure of negative mealtime interactions within the current study. The aims of the current study were to explore the impact of parent stress and feeding problems on negative mealtime interactions. A scale which includes subscales that reflect these constructs was thus deemed inappropriate in the context of this study, and a decision was made to include only the Positive Mealtime Environment subscale as a measure of the positive-negative dimension of mealtime interactions. Although this AYCE subscale used in this study was considered to be a measure of the tone of the mealtime ‘environment’ in this study it was considered to be an appropriate measure of the tone of mealtime ‘interactions’. Thus in the current study, the reverse scored Positive Mealtime Environment subscale served as the measure of Negative Mealtime interactions.

- The Positive Mealtime Environment subscale consists of five items, including “Mealtimes is a pleasant, family time” and “We have nice conversations during meals”. All items on this subscale were reverse scored to ensure consistency in interpretation. When reverse scored, high scores represent family mealtimes which reflect a negative mealtime environment.
which may be unpleasant and challenging for family members. Low scores represent positive family mealtimes which are characterised by pleasant family time which family members look forward to.

Davies et al. (2007) investigated the psychometric properties and factor structure of the AYCE in a sample of 763 mothers and co-parents of chronically ill and physically healthy children, aged between 8 and 16 years. The authors reported excellent internal consistency for the Positive Mealtime Environment scale The Cronbach alpha value was reported at .80. The AYCE has demonstrated convergent validity, with all scales relating (in the expected direction) with the Family Environment Scale (Moos & Moos, 1986). The measure has been used in a range of studies and across a range of participant groups (Noll et al., 1999; Piazza-Waggoner, Modi, Ingerski, Wu, & Zeller, 2011). Although AYCE was originally developed for use among older children, it has recently been used in research with children under 6 years (Boles, Scharf, & Stark, 2010; Hill, Silverman, Noel, & Bartz, 2014; Silverman et al., 2013). The Cronbach’s alphas for the Positive Mealtime Environment subscale scores in the current study are listed in Table 3.5. This value was above accepted levels (α > .70; Field, 2013) and suggest good internal reliability for the measure.

Table 3.5

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Developmental Disability</th>
<th>Typically Developing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive Mealtime Environment</td>
<td>.78</td>
<td>.77</td>
</tr>
</tbody>
</table>
The **Mealtime Behaviour Questionnaire** (MBQ; Berlin et al., 2010) was used to measure physical and behavioural feedings difficulties. The MBQ includes 33 self-report items which measure mealtime behaviours across four subscales: Food Refusal/Avoidance, Food Manipulation, Mealtime Aggression/Distress and Choking/Gagging/Vomiting. Participants are asked to rate of how frequently mealtimes behaviours occur on a 5-point Likert scale, ranging from 1 to 5 (**never, sometimes, always**). Items include mealtime behaviour, such as “throwing food”, “playing with food” and “verbally refusing to eat”.

- The Food Manipulation subscale consists of seven items, which include behaviours such as packing food in mouth, spitting out food and throwing food.

- The Food Refusal/Avoidance subscale is comprised of 12 items, which include behaviours such as leaving the table, pushing food away and eating only a few foods.

- The Choking, Gagging and Vomiting subscale consists of three items in which participants are asked to rate how frequently their child chokes or coughs on food or liquid, vomits or gags during mealtimes.

- The Mealtime Aggression/Distress subscale consists of nine items involving a rating of the frequency of occurrence of a range of behaviours such as crying, screaming, hitting or kicking objects and reporting physical pain.

Scoring is completed by summing the total item scores for each subscale. Higher scores on each subscale indicate a higher frequency of feeding problems and a measure of overall mealtime behaviour can be obtained by totalling the four subscale scores.
The MBQ was developed to assess the frequency of mealtime problems in children aged between 2 and 6 years, with the Total MBQ score demonstrating excellent reliability ($\alpha = .91$) and validity (Berlin et al., 2010). Using a community sample of 356 parent-child dyads, Berlin et al. reported that the internal consistencies of the MBQ subscales ranged from fair to excellent; Food Refusal/Avoidance ($\alpha = .89$), Food Manipulation ($\alpha = .73$), Mealtime Aggression/Distress ($\alpha = .81$) and Choking/Gagging and Vomiting ($\alpha = .76$) and Total MBQ ($\alpha = .91$). Construct validity was demonstrated through significant correlations, in the expected direction, with a well-established measure of mealtime behaviour, About Your Child’s Eating (Davies et al., 2007). The MBQ has been used to assess mealtime behaviours among young children with single ventricle heart defects (Hill et al., 2014) and among young children who are gastrostomy tube dependent (Silverman et al., 2013).

The MBQ does not provide a clinical cut off to determine the presence of feeding problems, therefore the Total MBQ scores were calculated in the typically developing group and the upper 95% confidence interval (95% CI = 1.93) was used as a cut off in both the typically developing group and the developmental disability group. This practice is commonplace in instances where valid and reliable clinical questionnaires lack a validated cut off, as is the case for the MBQ (e.g., Hyde et al., 2014).

**Reliability of Mealtime Behaviour Questionnaire.** The MBQ was critical for measuring and categorising feeding problems in this study, however there is limited literature regarding the internal consistency (i.e., reliability) of this measure. To assess the reliability of the MBQ within the current study, the
correlation of each item with the total score was assessed and Cronbach’s alphas were calculated for the total mealtime behaviour score and for each individual subscale. A minimum alpha coefficient of .70 was applied to benchmark adequate inter-item homogeneity (Field, 2013). Item-total correlations were also calculated in consideration of internal consistency; a minimum correlation of .3 was applied to determine adequate item-total correlations (Field, 2013). This information is presented in Table 3.6.

With the exception of items 2 and 24, all corrected item-total correlations were above .30. Analyses showed that there would be little improvement to Cronbach’s alpha if either item was deleted. As can be seen from Table 3.6, the Cronbach’s alpha for the total score, the Food Refusal subscale, the Food Manipulation subscale and the Mealtime Aggression subscale were adequate. However, the Choking/Gagging and Vomiting (CGV) subscale produced a low Cronbach’s alpha (0.66) and the three items included in the scale produced low correlations with the MBQ Total score. The three items from the CGV subscale were thus removed from the questionnaire and the reliability analysis was re-run. Results revealed no improvement in the Cronbach’s alpha for the MBQ Total score and little improvement in item-total correlations across items in the remaining subscales. For the purpose of this study, therefore, the Choking/Gagging and Vomiting subscales were included.
Table 3.6

Mealtime Behaviour Questionnaire Total Score, Subscale and Item Descriptive Statistics and Internal consistencies.

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>α</th>
<th>Corrected Item-total correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total CMB</strong></td>
<td>61.5</td>
<td>15.5</td>
<td>.89</td>
<td></td>
</tr>
<tr>
<td><strong>Food Manipulation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Hands in front of face</td>
<td>1.9</td>
<td>1.1</td>
<td>.43</td>
<td></td>
</tr>
<tr>
<td>2. Packing food in the mouth</td>
<td>2.5</td>
<td>1.2</td>
<td>.27</td>
<td></td>
</tr>
<tr>
<td>5. Throwing food</td>
<td>1.9</td>
<td>1.2</td>
<td>.56</td>
<td></td>
</tr>
<tr>
<td>11. Spitting at a person</td>
<td>1.2</td>
<td>0.5</td>
<td>.33</td>
<td></td>
</tr>
<tr>
<td>12. Letting food drop out of mouth</td>
<td>1.9</td>
<td>1.0</td>
<td>.55</td>
<td></td>
</tr>
<tr>
<td>13. Spitting out food</td>
<td>2.1</td>
<td>1.0</td>
<td>.57</td>
<td></td>
</tr>
<tr>
<td>14. Hiding food</td>
<td>1.2</td>
<td>0.7</td>
<td>.32</td>
<td></td>
</tr>
<tr>
<td><strong>Food refusal/avoidance</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Leaving the table</td>
<td>2.6</td>
<td>1.4</td>
<td>.46</td>
<td></td>
</tr>
<tr>
<td>4. Pushing spoon/food away</td>
<td>2.8</td>
<td>1.2</td>
<td>.52</td>
<td></td>
</tr>
<tr>
<td>16. Talking to keep from eating</td>
<td>2.0</td>
<td>1.3</td>
<td>.51</td>
<td></td>
</tr>
<tr>
<td>17. Deal making (negotiation)</td>
<td>2.1</td>
<td>1.4</td>
<td>.44</td>
<td></td>
</tr>
<tr>
<td>21. Pushing away food from table</td>
<td>2.5</td>
<td>1.2</td>
<td>.65</td>
<td></td>
</tr>
<tr>
<td>22. Only eating a few foods</td>
<td>3.2</td>
<td>1.3</td>
<td>.47</td>
<td></td>
</tr>
<tr>
<td>23. Eating too slowly</td>
<td>2.9</td>
<td>1.3</td>
<td>.63</td>
<td></td>
</tr>
<tr>
<td>24. Demanding alternative foods/forms</td>
<td>2.5</td>
<td>1.3</td>
<td>.29</td>
<td></td>
</tr>
<tr>
<td>25. Playing with food</td>
<td>2.8</td>
<td>1.2</td>
<td>.52</td>
<td></td>
</tr>
<tr>
<td>27. Playing with toys rather than eating</td>
<td>2.0</td>
<td>1.2</td>
<td>.66</td>
<td></td>
</tr>
<tr>
<td>28. Verbally refusing to eat</td>
<td>2.5</td>
<td>1.2</td>
<td>.51</td>
<td></td>
</tr>
<tr>
<td>33. Not sitting in chair</td>
<td>2.4</td>
<td>1.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Mealtime aggression/distress</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Refusing to come to the table</td>
<td>1.9</td>
<td>1.1</td>
<td>.53</td>
<td></td>
</tr>
<tr>
<td>7. Crying</td>
<td>1.9</td>
<td>1.0</td>
<td>.51</td>
<td></td>
</tr>
<tr>
<td>8. Screaming</td>
<td>1.6</td>
<td>0.9</td>
<td>.68</td>
<td></td>
</tr>
<tr>
<td>9. Hitting others or objects</td>
<td>1.5</td>
<td>0.9</td>
<td>.62</td>
<td></td>
</tr>
<tr>
<td>10. Kicking others or objects</td>
<td>1.4</td>
<td>0.8</td>
<td>.61</td>
<td></td>
</tr>
<tr>
<td>18. Reporting physical pain</td>
<td>1.4</td>
<td>0.9</td>
<td>.44</td>
<td></td>
</tr>
<tr>
<td>19. Asking for comfort or assurance</td>
<td>1.7</td>
<td>1.0</td>
<td>.40</td>
<td></td>
</tr>
<tr>
<td>20. Flailing arms/legs</td>
<td>1.6</td>
<td>0.9</td>
<td>.49</td>
<td></td>
</tr>
<tr>
<td>30. Biting others</td>
<td>1.1</td>
<td>0.3</td>
<td>.41</td>
<td></td>
</tr>
<tr>
<td><strong>Choking/Gagging/Vomiting</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26. Choking on food or liquid</td>
<td>1.7</td>
<td>0.9</td>
<td>.41</td>
<td></td>
</tr>
<tr>
<td>31. Gagging</td>
<td>1.4</td>
<td>0.8</td>
<td>.59</td>
<td></td>
</tr>
<tr>
<td>32. Vomiting</td>
<td>1.1</td>
<td>0.5</td>
<td>.56</td>
<td></td>
</tr>
</tbody>
</table>
The Feeding Strategies Questionnaire (FSQ; Berlin, Davies, Silverman & Rudolph, 2011) comprises 40 self-report items measuring family feeding strategies and mealtime structure across six subscales. Two of the six subscales were used in the current study; Parent Control of Intake (PCI) and Child Control of Intake (CCI). The FSQ asks caregivers to indicate the extent to which they agree or disagree with each item on a 5-point Likert scale, with responses ranging from 1 to 5 (strongly disagree, disagree, neither agree nor disagree, agree, strongly agree).

- The PCI subscale is comprised of six statements to measure the extent to which parents control their child’s food intake, such as “I don’t allow my child to eat more than I think s/he should” and “My child decides whether s/he will eat the foods offered at each meal” (reverse scored). Scoring is completed by summing the total item scores with higher scores reflecting higher parent control of intake.

- The CCI subscale measures the extent to which children control their own food intake through eight statements such as “My child knows when s/he is hungry” and “I never push my child to eat more than s/he says s/he wants”. Scoring is completed by summing the total item scores whereby higher scores reflect higher child control of intake.

The FSQ was developed for children who displayed feeding and swallowing difficulties. Berlin et al. (2011) developed and validated the questionnaire with a sample of caregivers of children aged between 2 and 6 years recruited from the community (n=702) and from families seeking services at a paediatric feeding specialty clinic (n=288). To establish estimates of reliability, alpha coefficients were calculated for each of the FSQ subscales.
across both the community and paediatric feeding clinic sample. The internal consistency coefficients for PCI and CCI showed acceptable reliability in both the community (PCI: $\alpha = 0.73$, CCI: $\alpha = 0.74$) and clinical samples (PCI: $\alpha = 0.76$, CCI: $\alpha = 0.72$) (Berlin et al., 2010). In the current study Cronbach’s alphas for the total and subscale scores are listed in Table 3.7. These values are above accepted levels ($\alpha > .70$; Field, 2013) and suggest good internal reliability for the measure.

Table 3.7.

*The Cronbach’s Alphas for relevant subscales of the FSQ*

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Developmental Disability</th>
<th>Typically Developing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parent Control Intake</td>
<td>.75</td>
<td>.81</td>
</tr>
<tr>
<td>Child Control Intake</td>
<td>.86</td>
<td>.85</td>
</tr>
</tbody>
</table>

**Procedure**

Ethics approval was granted by Deakin University Human Research Ethics Committee (see Appendix A). Participants were recruited via Research Invitations (see Appendix B) and Advertisements (see Appendix C). Participation was voluntary and either anonymous or de-identified if the participant opted to provide contact details, with recruitment undertaken through social media websites (e.g., Reddit and Facebook), and via flyers distributed through early childhood intervention services, kindergartens and disability support networks. Participants were provided with the option of completing a paper or online version of the questionnaire. The online version
was accessed through the Deakin University website and the paper copy with reply paid envelope was mailed to participants on their request.

Participants who chose to access the questionnaire online were required to access a Deakin University web link at their convenience. Upon doing so, they were taken directly to the Plain Language Statement (PLS) description of the study (see Appendix D). The PLS informed them that the study was completely voluntary and, that by completing and submitting the questionnaire, they were indicating they had read and understood the PLS and were expressing their consent to participate. Participants were informed that their participation was completely anonymous, unless they chose to be contacted regarding follow up research and provided identifying information at the conclusion of the questionnaire. Participants were then connected directly to the online survey, which took approximately 30 minutes to complete.

Participants who required a paper copy of the questionnaire were asked to contact the researcher by phone or email to organise for a copy of the questionnaire to be mailed out to them. Participants received the questionnaire, a reply paid envelope and a PLS (see Appendix E). Participants were informed that, by completing and returning the questionnaire, they were indicating that they had read and understood the PLS and were expressing their consent to participate. Upon completion of the questionnaire (see Appendix F - K), participants were invited to provide their contact details if they wished to participate in further research (see Appendix L). It was made clear that their identifying details would be kept separately from their coded questionnaire.

The primary caregiver was asked to complete the questionnaire; the primary caregiver was defined as the person who takes care of the child most
of the time. If participants indicated they had a child diagnosed with a disability or developmental delay they were asked to complete the questionnaire in regards to that child. If participants indicated that none of their children had been diagnosed with a disability or developmental delay, they were asked to complete the questionnaire with regard to the child in their family closest to pre-school or kindergarten age (approximately 4 years of age).

**Design and Analysis**

The following section outlines the aims of Study 1 and the analyses completed to address each aim. The design of this research is cross-sectional. Because this will not enable determination of causality, consideration will be given to the potential bi-directionality of any identified relationships.

1. **Parent stress:**

   **Aim 1a. The impact of developmental disabilities and feeding problems on parent stress.**

   **Total parent stress.** To determine the impact of feeding problems on overall parent stress, and whether it differs for caregivers of children with a developmental disability compared to caregivers of typically developing children. To address this aim, the Total Parent Stress score was subject to a two-way analysis of variance (feeding problems (low vs. high) x disability status (typical vs. atypical)). Tests of simple-main effects were conducted where appropriate.

   **Subtypes of parent stress.** As the above analysis demonstrated an effect for both level of feeding problem and disability status on the Total Parent Stress
Index, a further analysis of the effects on each of the three separate subscales of the Parent Stress Index was undertaken. To determine the impact of feeding problems on types of parent stress, and whether this differed for caregivers of children with a developmental disability compared to caregivers of typically developing children. To address this aim, the three subscales of the Parent Stress Index (Difficult Child, Parent Child Dysfunctional Interaction and Parent Distress) were subject to three separate two-way analyses of variance (feeding problems (low vs. high) x disability status (typical vs. atypical)). Tests of simple-main effects were conducted where appropriate.

**Aim 1b: The types of feeding problems that predict parent stress and the impact of developmental disability.**

**Types of feeding problems.** To establish which types of feeding problems predict parent stress, a standard multiple regression was performed which included the Total Parent Stress Index score as the dependent variable and the four subscales of the Mealtime Behaviour Questionnaire (MBQ) as the independent variables (Food refusal, Mealtime aggression, Food manipulation and Choking/gagging and vomiting). To aid in interpretability, all independent variables were grand mean centred (Field, 2013).

**Impact of developmental disability.** To determine if the relationship between each of the four types of feeding problems, and parent stress differed between primary caregivers of typically developing children and primary caregivers of children with a developmental disability, four separate moderating regression analyses were run. In each case, disability status was examined as a moderator in the relationship between the Total Parent Stress Index score and each separate subscale of the MBQ (Food refusal, Mealtime
aggression, Food manipulation and Choking/gagging and vomiting). In the first step of each regression analysis, the Total Parent Stress Index score was entered as the dependant variable, with one of the four Mealtime Behaviour Questionnaire subscales. In the second step of each regression analysis, the interaction term between disability status and the applicable Mealtime Behaviour Questionnaire subscale scores was added to regression. This process was repeated for each of the four Mealtime Behaviour Questionnaire subscales.

Interpretation: The analysis undertaken allowed the impact of each independent variable on the dependent variable to be determined in two possible ways: one was to use the beta weights for each independent variable from the multiple regression, the other is to use the R^2 value from the first step of the subsequent moderating regressions, where each independent variable was entered individually as a predictor of the dependant variable prior to the moderating term being entered in a second step. The beta weights were used to determine the impact of the independent variable on the dependant variable as they were considered to be a more conservative prediction of the dependant variable, as they hold the influence of all other independent variables constant.

2. Negative Mealtime Interactions:

Aim 2a: The impact of developmental disabilities and feeding problems on negative mealtime interactions.

The second aim was to determine if the influence of feeding problems on negative mealtime interactions differed between caregivers of children with a developmental disability and caregivers of typically developing children. To address this aim, the Negative Mealtime Interactions scale score was subject to a two-way analysis of variance (feeding problems (low vs. high) x disability
status (typical vs. atypical)). Tests of simple-main effects were conducted where appropriate.

**Aim 2b: Aspects of the mealtime environment that predict negative mealtime interactions and the impact of developmental disability.**

*Aspects of the mealtime environment.* To determine which aspects of the mealtime environment predict negative mealtime interactions, a standard multiple regression was performed, with Negative Mealtime Interaction as the dependent variable and measures of Mealtime Environment as the independent variables (Mealtime Socialisation, Total Parent Stress Index, Total MBQ, Parent Control Eating and Child Control Eating). To aid in interpretability, all independent variables were grand mean centred (Field, 2013).

*Impact of developmental disability.* Five separate moderating regressions were run to determine if the relationship between aspects of the mealtime environment and negative mealtime interactions differed for primary caregivers of typically developing children and primary caregivers of children with a developmental disability. In each case, disability status was examined as a moderator in the relationship between the Negative Mealtime Interaction score and one of the five measures of Mealtime Environment (Mealtime Socialisation, Total Parent Stress Index, Total MBQ, Parent Control Eating and Child Control Eating). In the first step of each regression analysis, the Negative Mealtime Interaction score was entered as the dependent variable, with one of the five measures of the Mealtime Environment. In the second step of each regression analysis, the interaction term between disability status and the applicable Mealtime Environment measure was entered into the regression.
This process was repeated for each of the five measures of the Mealtime Environment.

*Interpretation.* As per the previous analyses (Aim 1b) where a multiple regression was followed up by moderating regressions with each independent variable entered in the first step, the impact of each independent on the dependant variable was determined by the beta weight scores from the multiple regression.

*Subscales of the Mealtime Behaviour Questionnaire (MBQ).* As feeding problems were found to be a significant predictor of negative mealtime interactions, further analyses were run to determine which types of feeding problems (as measured by subscales of the MBQ) predicted Negative Mealtime Interaction scores. To better understand which types of feeding problems A standard multiple regression was performed, which included Negative Mealtime Interaction as the dependent variable and the four subscales of the MBQ, as the independent variables (Food refusal, Mealtime aggression, Food manipulation and Choking/gagging and vomiting). To aid in interpretability, all independent variables were grand mean centred (Field, 2013).

*Impact of developmental disability.* To determine if the relationship between each of the four types of feeding problems and negative mealtime interactions differed between primary caregivers of typically developing children and those of children with a developmental disability, four separate moderating regression analyses were run. In each case, disability status was examined as a moderator in the relationship between the Negative Mealtime Interactions score and each separate subscale of the MBQ (Food refusal,
Mealtime aggression, Food manipulation and Choking/gagging and vomiting). Separate moderating regressions were run, one for each of the four subscales of the MBQ. In the first step of each regression analysis, the Negative Mealtime Interaction score was entered as the dependent variable, with one of the four MBQ subscales. In the second step of each regression analysis, the interaction term between disability status and the applicable MBQ subscale scores was added to the regression. This process was repeated for each of the four MBQ subscales.

*Interpretation.* As per the previous analyses (Aim 1b and 2b) where a multiple regression was followed up by moderating regressions with each independent variable entered in the first step, the impact of each independent on the dependant variable was determined by the beta weight scores from the multiple regression.

3. *Mealtime Socialisation:*

**Aim 3: The impact of developmental disabilities and feeding problems on mealtime socialisation.** To determine if the influence of feeding problems on mealtime socialisation differed between caregivers of children with a developmental disability and caregivers of typically developing children. To address this aim, the Mealtime Socialisation subscale score was subject to a two-way analysis of variance (feeding problems (low vs. high) x disability status (typical vs. atypical)). Tests of simple-main effects were conducted where appropriate.
**Multiple Comparisons.** The Type I error rate may have increased due to multiple comparisons, however the Type I error rate was not adjusted as doing so increases the likelihood of a Type II error occurring (Cole, 1979; Perneger, 1998; Savitz & Olsh., 1995; Rothman, 1990; Thomas, Siemiatycki, Dewar, Robins, Goldberg., & Armstrong, 1985).
CHAPTER 4
STUDY 1 RESULTS

Data Screening and Assumptions

A power analysis was run prior to the analyses being conducted as a guide to the sample size required to ensure adequate power (Tabachnik & Fidell, 2014). Variables were assessed for outliers, normality, linearity, multicollinearity, homogeneity of variance and independence of errors and missing data was addressed (for more detail see Appendix M).

1. Parent stress:

Aim 1a: The impact of developmental disabilities and feeding problems on parent stress.

Total parent stress. To determine the impact of feeding problems on overall parent stress, and whether it differs for caregivers of children with a developmental disability compared to caregivers of typically developing children. To address this aim, the Total Parent Stress score was subject to a two-way analysis of variance (feeding problems (low vs. high) x disability status (typical vs. atypical)). Tests of simple-main effects were conducted where appropriate.

The analysis showed a significant main effect for disability status, with caregivers of children with a developmental disability ($M = 2.87, SD = .69$) showing significantly higher scores on the Total Parent Stress Index when compared to caregivers of typically developing children ($M = 1.92, SD = .48$; $F(1,289) = 73.41, p < .01$ partial $\eta^2 = .20$). Similarly, a significant main effect for feeding problem was observed with caregivers of children with high feeding problems ($M = 2.45, SD = .69$) showing significantly higher scores on
the Total Parent Stress Index than caregivers of children with low feeding problems ($M = 1.85, SD = .50; F(1,289) = 37.53, p < .01$, partial $\eta^2 = .12$). There was a statistically significant interaction between disability status and level of feedings problem ($F(1,289) = 6.63, p = .01$, partial $\eta^2 = .02$).

Means and standard deviations for Total Parent Stress Index scores by feeding problems and child disability status groups are shown in Figure 4.1.

Tests of simple main effects revealed that the impact that feeding problems had on parental stress was greater for parents of a child with developmental disability than for those with a typically developing child.

There was a statistically significant difference in ‘Total Parent Stress Index” scores between caregivers of children with a developmental disability and high levels of feeding problems and caregivers of children with
developmental disability and low levels of feeding problems. For caregivers of children with a developmental disability, the mean "Total Parent Stress Index" score was .72 points, 95% CI [.42 – 1.01] higher when the child had high levels of feeding problem compared to when the child had low levels of feeding problems, $F(1, 289) = 22.79, p < .01$, partial $\eta^2 = .07$.

There was a statistically significant difference in 'Total Parent Stress Index” scores between caregivers of typically developing children with high levels of feeding problems and caregivers of typically developing children with low levels of feeding problems. For caregivers of typically developing children, the mean "Total Parent Stress Index" score was .29 points, 95% CI [.16 - .43] higher when the child had high levels of feeding problem compared to when the child had low levels of feeding problems, $F(1, 289) = 18.58, p < .01$, partial $\eta^2 = .06$.

**Subtypes of parent stress.** As the above analysis demonstrated an effect on the Total Parent Stress Index for both level of feeding problem and disability status, further analyses of the effects on each of the three separate subscales of the Parent Stress Index was undertaken. Accordingly, three separate two-way (feeding problems (low vs. high) x disability status (typical vs. atypical)) analyses of variance were conducted on each separate subscale of the Parent Stress Index (Difficult Child, Parent Child Dysfunctional Interaction and Parent Distress). Tests of simple-main effects were conducted where appropriate.

**Parent distress (PD).** The Two-way ANOVA on PD revealed a significant main effect for disability status, with caregivers of children with a developmental disability ($M = 2.94, SD = .94$) showing significantly higher
scores on PD subscale when compared to caregivers of typically developing children ($M = 2.23, SD = .70; F(1,289) = 14.55, p < .01$, partial $\eta^2 = .05$).

Similarly, a significant main effect for feeding problems was observed, with caregivers of children with high feeding problems ($M = 2.67, SD = .86$) showing significantly higher scores on the PD subscale than caregivers of children with low feeding problems ($M = 2.13, SD = .67, F(1,289) = 17.73, p < .01$, partial $\eta^2 = .06$). There was not a statistically significant interaction between disability status and the level of feeding problems ($F(1,289) = 2.28, p = .13$, partial $\eta^2 = .01$).

Means and standard deviations for PD scores by feeding problems and child disability status groups are shown in Figure 4.2.

![Figure 4.2](image_url)

Figure 4.2. Mean and Standard Error of Parent Distress Subscale Score for Caregivers of Typically Developing Children and Caregivers of Children with a Developmental Disability by Level of Feeding Problems.
Parent-child dysfunctional interaction. The Two-way ANOVA on parent-child dysfunctional interactions revealed a significant main effect for disability status, with caregivers of children with a developmental disability ($M = 2.44$, $SD = .74$) showing significantly higher scores on P-CDI subscale than caregivers of typically developing children ($M = 1.50$, $SD = .41$; $F(1,288) = 97.15$, $p < .01$, partial $\eta^2 = .25$). Similarly, a significant main effect for feeding problems was observed, with caregivers of children with high feeding problems ($M = 1.94$, $SD = .70$) showing significantly higher scores on the P-CDI subscale when compared to caregivers of children with low feeding problems ($M = 1.49$, $SD = .48$; $F(1,288) = 13.22$, $p < .01$, partial $\eta^2 = .04$). There was not a statistically significant interaction between disability status and the level of feeding problems ($F(1,288) = 1.84$, $p = .18$, partial $\eta^2 = .01$). Means and standard deviations for P-CDI scores by feeding problems and child disability status groups are shown in Figure 4.3.

![Figure 4.3](image)

*Figure 4.3.* Mean and Standard Error of Parent-Child Difficult Interaction for Caregivers of Typically Developing Children and Caregivers of Children with a Developmental Disability by Level of Feeding Problem.
Difficult child (DC). The two-way ANOVA on DC revealed a significant main effect for disability status, with caregivers of children with a developmental disability ($M = 3.32, SD = .86$) showing significantly higher scores on DC subscale when compared to caregivers of typically developing children ($M = 2.02, SD = .66; F(1,288) = 62.94, p < .01$, partial $\eta^2 = .18$). Similarly, a significant main effect for feeding problems was observed, with caregivers of children with high feeding problems ($M = 2.69, SD = .88$) showing significantly higher scores on the DC subscale than caregivers of children with low feeding problems ($M = 1.92, SD = .67; F(1,288) = 43.00, p < .01$, partial $\eta^2 = .13$). There was a statistically significant interaction between disability status and the level of feeding problem ($F(1,288) = 9.71, p < .01$, partial $\eta^2 = .03$). Means and standard deviations for DC scores by feeding problems and child disability status groups are shown in Figure 4.4.

![Figure 4.4](image-url-goes-here)

*Figure 4.4. Mean and Standard Error of Difficult Child scores for Caregivers of Typically Developing Children and Caregivers of Children with a Developmental Disability by Level of Feeding Problem.*
Tests of simple main effects revealed that the impact that feeding problems had on the difficult child subscale was greater for parents of a child with developmental disability than for those with a typically developing child.

Tests of simple main effects revealed that, there was a statistically significant difference in the 'Difficult Child' subscale score between caregivers of children with a developmental disability and high levels of feeding problems and caregivers of children with developmental disability and low levels of feeding problems. For caregivers of children with a developmental disability, the mean "Difficult Child" subscale score was 1.05 points, 95% CI [.66 – 1.44] higher when the child had high levels of feeding problems compared to when the child had low levels of feeding problems, $F(1, 288) = 28.19, p < .01$, partial $\eta^2 = .08$.

There was a statistically significant difference in 'Difficult Child' subscale score between caregivers of typically developing children with high levels of feeding problems and caregivers of typically developing children with low levels of feeding problems. For caregivers of typically developing children, the mean "Difficult Child" score was .38 points, 95% CI [.19 - .55] higher for caregivers when the child had high levels of feeding problems compared to when the child had low levels of feeding problems, $F(1, 289) = 17.40, p < .01$, partial $\eta^2 = .05$.

**Aim 1b: The types of feeding problems that predict parent stress and the impact of developmental disability.**

*Types of feeding problems.* To establish which types of feeding problems predict parent stress, a standard multiple regression was performed, which included the Total Parent Stress Index score as the dependent variable
and the four subscales of the Mealtime Behaviour Questionnaire (MBQ) as the independent variables (Food refusal, Mealtime aggression, Food manipulation and Choking/gagging and vomiting).

The model accounted for a significant amount of variance, explaining 34% of the variance in Total Parent Stress Index scores ($F(4, 291) = 36.42, p < .01$, adj. $R^2 = .34$). Only the Mealtime aggression subscale and Food refusal subscale significantly predicted Total Parent Stress Index scores, $p < .01$. It should be noted that the Choking gagging vomiting subscale just fell short of significance. Regression coefficients and standard errors for Mealtime Behaviour Questionnaire subscales predicting Total Parent Stress Index scores, can be found in Table 4.1.

Table 4.1.

*Summary of Standard Multiple Regression, MBQ Subscales Predicting Total Parent Stress Index scores.*

<table>
<thead>
<tr>
<th>Variable</th>
<th>$B$</th>
<th>$SE$ $B$</th>
<th>$\beta$</th>
<th>$t$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mealtime Aggression</td>
<td>.43</td>
<td>.08</td>
<td>.35</td>
<td>5.15</td>
<td>.00</td>
</tr>
<tr>
<td>Food Refusal</td>
<td>.18</td>
<td>.06</td>
<td>.21</td>
<td>3.32</td>
<td>.00</td>
</tr>
<tr>
<td>Food Manipulation</td>
<td>.07</td>
<td>.06</td>
<td>.06</td>
<td>1.12</td>
<td>.27</td>
</tr>
<tr>
<td>Choking Gagging Vomiting</td>
<td>.12</td>
<td>.07</td>
<td>.10</td>
<td>1.88</td>
<td>.06</td>
</tr>
</tbody>
</table>

*Impact of developmental disability.* To determine if the relationship between each of the four types of feeding problems and parent stress differed between primary caregivers of typically developing children and primary caregivers of children with a developmental disability, four separate
moderating regressions were run. In each case, disability status was examined as a moderator in the relationship between the Total Parent Stress Index score and each separate subscale of the MBQ (Food refusal, Mealtime aggression, Food manipulation and Choking/gagging and vomiting).

In the first step of each regression analysis, the Total Parent Stress Index score was entered as the dependent variable, with one of the four MBQ subscales. In the second step of each regression analysis, the interaction term between disability status and the applicable MBQ subscale score was added to the regression. This process was repeated for each of the four MBQ subscales.

*Is the influence of mealtime aggression on parent stress moderated by the presence of disability?* Analysis showed that a significant 47% of the variance in Total Parent Stress Index score was explained by the Mealtime aggression subscale (*Model 1; R² = .47, F(2, 287) = 126.58, p < .01*). The amount of variance explained did not change significantly when disability status was entered into the model as a moderating term (*ΔR² = .00, F(1, 287) = .16, p = .69*).

*Is the influence of food refusal on parent stress moderated by the presence of disability?* Analysis showed that a significant 44% of variance in Total Parent Stress Index score was explained by the Food refusal subscale (*Model 1; R² = .44, F(2, 287) = 114.51, p < .01*). The amount of variance explained did not change significantly when disability status was entered into the model as a moderating term (*ΔR² = .00, F(1, 286) = 1.05, p = .31*).

*Is the influence of food manipulation on parent stress moderated by the presence of disability?* Analysis showed that a significant 39% of the variance in Total Parent Stress Index score was explained by the Food manipulation
subscale (Model 1; $R^2 = .39$, $F(2, 288) = 91.74$, $p < .001$). The amount of variance explained did not change significantly when disability status was entered into the model as a moderating term ($\Delta R^2 = .00$, $F(1, 287) = .24$, $p = .62$).

Is the influence of choking/gagging and vomiting on parent stress moderated by the presence of disability? Analysis showed that a significant 36% of the variance in Total Parent Stress Index score that was explained by the Choking/gagging and vomiting subscale (Model 1; $R^2 = .36$, $F(2, 288) = 84.05$, $p < .01$). The amount of variance explained did not change significantly when disability status was entered into the model as a moderating term ($\Delta R^2 = .00$, $F(1, 287) = 1.77$, $p = .18$).

2. Negative Mealtime Interactions.

Aim 2a: The impact of developmental disabilities and feeding problems on negative mealtime interactions. To determine if the influence of feeding problems on mealtime interactions differed between caregivers of children with a developmental disability and caregivers of typically developing children. To address this aim, the Negative Mealtime Interactions scale score was subject to a two-way analysis of variance (feeding problems (low vs. high) x disability status (typical vs. atypical)). Tests of simple-main effects were conducted where appropriate.

The two-way ANOVA on Negative Mealtime Interactions revealed a significant main effect for disability status with caregivers of children with developmental disabilities ($M = 3.14$, $SD = .83$) showing significantly higher scores on Negative Mealtime Interactions when compared to caregivers of
typically developing children ($M = 2.21$, $SD = .70$; $F(1,289) = 39.31, p < .01$, partial $\eta^2 = .12$). Similarly, a significant main effect for feeding problems was observed with caregivers of children with high feeding problems ($M = 2.82$, $SD = .80$) showing significantly higher scores on the Negative Mealtime Interactions when compared to caregivers of children with low feeding problems ($M = 2.03$, $SD = .65$; $F(1,289) = 29.91, p < .01$, partial $\eta^2 = .09$). There was not a statistically significant interaction between disability status and the level of feeding problem ($F(1,289) = .03, p = .86$, partial $\eta^2 = .00$).

Means and standard deviations for Negative Mealtime Interactions scores by feeding problems and child disability status groups are shown in Figure 4.5.

![Figure 4.5](image)

**Figure 4.5.** Mean and Standard Error of Negative Mealtime Interaction Scores for Caregivers of Typically Developing Children and Caregivers of Children with a Developmental Disability by Level of Feeding Problem.

**Aim 2b:** Aspects of the mealtime environment that predict negative mealtime interactions and the impact of developmental disability.
Aspects of the mealtime environment. To determine which aspects of the mealtime environment predict negative mealtime interactions, a standard multiple regression was performed, which included the Negative Mealtime Interaction as the dependent variable and the five measures of Mealtime Environment as the independent variables (Mealtime Socialisation, Total Parent Stress Index, Total MBQ, Parent Control Eating and Child Control Eating).

The model accounted for a significant amount of variance, explaining 51% of the variance in Negative Mealtime Interactions score ($F(5, 289) = 58.51, p < .01, \Delta R^2 = .51$). All Measures of the Mealtime Environment (Mealtime Socialisation, Total Child Mealtime Behaviour, Child Control of Eating, Parent Control Intake and Total Parent Stress) significantly predicted Negative Mealtime Interaction score, $p < .01$. Regression coefficients and standard errors for Mealtime Environment measures predicting Negative Mealtime Interaction scores can be found in Table 4.2.

Table 4.2.
Summary of Standard Multiple Regression, Mealtime Environment Measures Predicting Negative Mealtime Interaction Scores.

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mealtime Socialisation</td>
<td>-.23</td>
<td>.06</td>
<td>-.17</td>
<td>-3.93</td>
<td>.00</td>
</tr>
<tr>
<td>Total Child MBQ</td>
<td>.48</td>
<td>.08</td>
<td>.29</td>
<td>5.73</td>
<td>.00</td>
</tr>
<tr>
<td>Total Parent Stress Index</td>
<td>.38</td>
<td>.07</td>
<td>.30</td>
<td>5.51</td>
<td>.00</td>
</tr>
<tr>
<td>Child Control Intake</td>
<td>-.29</td>
<td>.06</td>
<td>-.26</td>
<td>-4.93</td>
<td>.00</td>
</tr>
<tr>
<td>Parent Control Intake</td>
<td>.11</td>
<td>.05</td>
<td>.10</td>
<td>2.9</td>
<td>.04</td>
</tr>
</tbody>
</table>
**Impact of developmental disability.** To determine if the relationship between aspects of the mealtime environment and negative mealtime interactions, differed for primary caregivers of typically developing children and primary caregivers of children with a developmental disability, five separate moderating regressions were run. In each case, disability status was examined as a moderator in the relationship between the Negative Mealtime Interaction score and one of the five measures of Mealtime Environment (Mealtime Socialisation, Total Parent Stress Index, Total MBQ, Parent Control Eating and Child Control Eating).

In the first step of each regression analysis, the Negative Mealtime Interaction score was entered as the dependent variable, with one of the five measures of the Mealtime Environment. In the second step of each regression analysis, the interaction term between disability status and the applicable Mealtime Environment measure was entered into the regression. This process was repeated for each of the five measures of the Mealtime Environment.

*Is the influence of mealtime socialisation on negative mealtime interactions moderated by the presence of disability?* Analysis showed that a significant 28% of the variance in the Negative Mealtime Interaction score was explained by the Mealtime Socialisation score (*Model 1; $R^2 = .28, F(2, 289) = 56.55, p < .01$). The amount of variance explained did not change significantly when disability status was entered into the model as a moderating term ($\Delta R^2 = .01, F(1, 288) = .239, p = .12$).

*Is the influence of parent stress on negative mealtime interactions moderated by the presence of disability?* Analysis showed that a significant 38% the variance in Negative Mealtime Interaction score was explained by the
Total Parent Stress Index score (Model 1; $R^2 = .38, F(2, 288) = 89.86, p < .01$). The amount of variance explained did not change significantly when disability status was entered into the model as a moderating term ($\Delta R^2 = .00, F(1, 287) = .18, p = .67$).

*Is the influence of feeding problems on negative mealtime interactions moderated by the presence of disability?* Analysis showed that a significant 38% of the variance in Negative Mealtime Interaction score was explained by the Total Mealtime Behaviour Questionnaire score (Model 1; $R^2 = .39, F(2, 290) = 90.94, p < .01$). The amount of variance explained did change significantly when disability status was entered into the model as a moderating term ($\Delta R^2 = .02, F(1, 289) = 8.51, p < .05$). Although the results reveal that disability status explained a significant change in the model, the model showed small effect sizes, with disability status explaining an additional 2% of the variance in Negative Mealtime Interactions.

*Is the influence of child control of intake on negative mealtime interactions moderated by the presence of disability?* Analysis showed that a significant 33% of variance in Negative Mealtime Interaction score was explained by the Child Control Intake (Model 1; $R^2 = .33, F(2, 289) = 71.25, p < .01$). The amount of variance explained did not change significantly when disability status was entered into the model as a moderating term ($\Delta R^2 = .00, F(1, 288) = .17, p = .67$).

*Is the influence of parent control of intake on negative mealtime interactions moderated by the presence of disability?* Analysis showed that a significant 22% of variance in Negative Mealtime Interaction score was explained by the Parent Control Intake (Model 1; $R^2 = .23, F(2, 288) = 42.61, p$
The amount of variance explained did not change significantly when disability status was entered into the model as a moderating term ($\Delta R^2 = .00$, $F(1, 287) = 1.06, p = .30$).

**Subscales of the Mealtime Behaviour Questionnaire (MBQ).** To establish which types of feeding problems predict negative mealtime interactions, a standard multiple regression was performed, which included the Negative Mealtime Interaction score as the dependent variable and the four subscales of the MBQ as the independent variables (Food refusal, Mealtime aggression, Food manipulation and Choking/gagging and vomiting).

The model accounted for a significant amount of variance, explaining 32% of the variance in Negative Mealtime Interaction scores ($F(4, 287) = 35.503, p < .01, \Delta R^2 = .32$). Only the Mealtime aggression subscale and Food refusal subscale significantly predicted Negative Mealtime Interaction scores, $p < .01$. Regression coefficients and standard errors for MBQ subscales predicting Negative Mealtime Interaction scores, can be found in Table 4.3.

Table 4.3.

*Summary of Standard Multiple Regression, Mealtime Behaviour Questionnaire Subscales Predicting Negative Mealtime Interactions.*

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>$\beta$</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mealtime Aggression</td>
<td>.30</td>
<td>.10</td>
<td>.20</td>
<td>2.89</td>
<td>.00</td>
</tr>
<tr>
<td>Food Refusal</td>
<td>.42</td>
<td>.07</td>
<td>.39</td>
<td>6.10</td>
<td>.00</td>
</tr>
<tr>
<td>Food Manipulation</td>
<td>.07</td>
<td>.08</td>
<td>.05</td>
<td>.89</td>
<td>.37</td>
</tr>
<tr>
<td>Choking Gagging Vomiting</td>
<td>.08</td>
<td>.08</td>
<td>.05</td>
<td>.98</td>
<td>.33</td>
</tr>
</tbody>
</table>
Impact of developmental disability. To determine if the relationship between each of the four types of feeding problems and negative mealtime interactions differed between primary caregivers of typically developing children and primary caregivers of children with a developmental disability, four separate moderating regression analyses were run. In each case, disability status was examined as a moderator in the relationship between the Negative Mealtime Interaction score and each separate subscale of the MBQ (Food refusal, Mealtime aggression, Food manipulation and Choking/gagging and vomiting).

In the first step of each regression analysis, the Negative Mealtime Interaction score was entered as the dependent variable, with one of the four MBQ subscales. In the second step of each regression analysis, the interaction term between disability status and the applicable MBQ subscale scores was added to the regression. This process was repeated for each of the four MBQ subscales.

The first analysis showed that 33% of the variance in Negative Mealtime Interaction score was explained by the Mealtime aggression subscale (Model 1; $R^2 = .33$, $F(2, 290) = 71.28$, $p < .01$). The amount of variance explained did change significantly when disability status was entered into the model as a moderating term ($\Delta R^2 = .01$, $F(1, 289) = 6.03$, $p < .05$). Although the results reveal that disability status explained a significant change in the model, the model showed small effect sizes, with disability status explaining an additional 1% of the variance in Negative Mealtime Interactions.

The second analysis showed that 39% of the variance in Negative Mealtime Interaction score was explained by the Food Refusal subscale (Model
The amount of variance explained did change significantly when disability status was entered into the model as a moderating term ($\Delta R^2 = .01$, $F(1, 288) = 5.03, p < .05$). Although the results reveal that disability status explained a significant change in the model, the model showed small effect sizes, with disability status explaining an additional 1% of the variance in Negative Mealtime Interactions.

The third analysis showed that 25% of the variance in Negative Mealtime Interaction score was explained by the Food manipulation subscale ($Model 1; R^2 = .25, F(2, 290) = 48.23, p < .01$). The amount of variance explained did not change significantly when disability status was entered into the model as a moderating term ($\Delta R^2 = .00, F(1, 289) = .06, p = .81$).

The fourth analysis showed that 23% of the variance in Negative Mealtime Interaction score was explained by the Choking/gagging and vomiting subscale ($Model 1; R^2 = .23, F(2, 290) = 44.01, p < .01$). The amount of variance explained did change significantly when disability status was entered into the model as a moderating term ($\Delta R^2 = .02, F(1, 289) = 9.17, p < .05$). Although the results reveal that disability status explained a significant change in the model, the model showed small effect sizes, with disability status explaining an additional 2% of the variance in Negative Mealtime Interactions.

3. Mealtime Socialisation:

Aim 3: The impact of developmental disabilities and feeding problems on mealtime socialisation.

To determine if the influence of feeding problems on mealtime socialisation differed between caregivers of children with a developmental
disability and caregivers of typically developing children. To address this aim, the Mealtime Socialisation subscale score was subject to a two-way analysis of variance (feeding problems (low vs. high) x disability status (typical vs. atypical)). Tests of simple-main effects were conducted where appropriate.

The two-way ANOVA on Mealtime Socialisation failed to show a significant main effect for disability status ($F(1,288) = 1.57, p = .21$, partial $\eta^2 = .01$), indicating no difference in Mealtime Socialisation scores between caregivers of typically developing children and caregivers of children with developmental disabilities. Similarly, there was no significant main effect for feeding problems ($F(1,288) = .87, p = .35$, partial $\eta^2 = .00$) indicating no difference in Mealtime Socialisation scores between caregivers of children with high levels of feeding problems and caregivers of children with low levels of feeding problems. There was not a statistically significant interaction between disability status and the level of feeding problem ($F(1,288) = .96, p = .33$, partial $\eta^2 = .01$).

Upon further consideration of the Mealtime Socialisation subscale from the Toddler Parent Mealtime Behaviour Questionnaire (Stommel et al., 2008), it appeared that this measure may not have fully captured aspects of Mealtime Socialisation which were considered to be important in the current study. In interpreting the results from the Mealtime Socialisation subscale, it is important to note that this subscale provided a measure of the frequency of Mealtime Socialisation rather than a measure of the quality or value of Mealtime Socialisation. For example, the measure included items such as “I sit down with my child at meals” and “My child gets my full attention during meals”. It was apparent that high scores on the Mealtime Socialisation
subscale may not necessarily reflect mealtimes that are full of rich social mealtimes, as it would be possible for a caregiver to score highly on this measure even if mealtimes focused on caregiving aspects of the mealtime rather than social interactions. This points to the need for a closer examination of mealtimes socialisation, which to some extent, will be addressed in Study 2.

*Figure 4.6. Mean and Standard Error of Mealtime Socialisation Scores for Caregivers of Typically Developing Children and Caregivers of Children with a Developmental Disability by Level of Feeding Problem.*

The results of Study 1 have been presented in this chapter in line with the five central study aims and their components. An integrated discussion of the implications of these results will be discussed in Chapter 7, along with those from Study 2. The next chapter describes the methods for Study 2.
CHAPTER 5

STUDY 2 METHOD

Study 2 involved an objective measurement of mealtime interactions across a small sample of representative families in order to further explore the impact of developmental disability and of feeding problems on mealtime socialisation. The interactions between target children and primary caregivers were explored in this study to determine the impact of developmental disability and of feeding problems on mealtime socialisation. In particular, this focused study involved the systematic analysis of video recordings of one typical mealtime at the family home to determine: whether the proportion of directive and social interactions and the tone and focus of directive and social mealtime interactions displayed between target children and primary caregivers during mealtimes differed across families (thesis aims 4a and 4b).

Participants

Eight families participated in the video observations; four families included a child who was diagnosed with a developmental disability and four families included a child who was typically developing. Target children ranged in age from 1.6 years to 5.5 years. The quantitative information obtained from the questionnaires completed by caregivers in Study 1 was used to assign families to different groups to enable comparisons (refer Table 5.1).
Table 5.1.

*Disability status, Gender, Age, Feeding Problem and Family Members Present at Mealtime for Target Children.*

<table>
<thead>
<tr>
<th>Target Child</th>
<th>Development</th>
<th>Gender</th>
<th>Age</th>
<th>Feeding Group</th>
<th>Family members present</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Typical</td>
<td>M</td>
<td>2.4</td>
<td>Low</td>
<td>PC &amp; SC</td>
</tr>
<tr>
<td>B</td>
<td>Typical</td>
<td>F</td>
<td>1.6</td>
<td>Low</td>
<td>PC, SC &amp; 2OS</td>
</tr>
<tr>
<td>C</td>
<td>Typical</td>
<td>F</td>
<td>2.0</td>
<td>High</td>
<td>PC, SC &amp; YS</td>
</tr>
<tr>
<td>D</td>
<td>Typical</td>
<td>M</td>
<td>2.6</td>
<td>High</td>
<td>PC</td>
</tr>
<tr>
<td>E</td>
<td>HF ASD</td>
<td>F</td>
<td>3.2</td>
<td>Low</td>
<td>PC, SC &amp; YS</td>
</tr>
<tr>
<td>F</td>
<td>Down Syndrome</td>
<td>F</td>
<td>2.1</td>
<td>High</td>
<td>PC, SC &amp; 2OS</td>
</tr>
<tr>
<td>G</td>
<td>Developmental Delay</td>
<td>M</td>
<td>5.5</td>
<td>High</td>
<td>PC</td>
</tr>
<tr>
<td>H</td>
<td>ASD</td>
<td>M</td>
<td>3.5</td>
<td>High</td>
<td>PC &amp; SC</td>
</tr>
</tbody>
</table>

*Note:* PC = Primary Caregiver, SC = Secondary Caregiver, YS = Younger Sibling, OS = Older Sibling

**Materials**

**Coding Interaction variables.** A coding system developed by Veness and Reilly (2008) was used to analyse the video recordings. This coding system was determined to be appropriate as it categorised both verbal and non-verbal interactions based on Social and Directive functions. (see Table 5.2 for definition of functions). Two coders independently viewed and coded the mealtime recordings. When a coded interaction occurred between the primary caregiver and the target child, the coder noted who initiated the interaction (primary caregiver or target child), and the function of the interaction. When conducting the thematic analysis the tone of an interaction was coded as being
positive, negative or neutral; this was based on tone of voice, facial
expressions and body language used during the interaction.

Table 5.2.

*Summary of Interaction Coding System Developed by Veness and Reilly (2008)*

<table>
<thead>
<tr>
<th>Function</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Directive Function:</strong></td>
<td></td>
</tr>
<tr>
<td>Request object/action</td>
<td>An utterance or behaviour used to command another to perform a desired</td>
</tr>
<tr>
<td></td>
<td>action or give them a desired object.</td>
</tr>
<tr>
<td>Protest</td>
<td>An utterance or behaviour used to reject an undesired object of command</td>
</tr>
<tr>
<td></td>
<td>another to cease an undesired action</td>
</tr>
<tr>
<td>Request joint attention</td>
<td>An utterance or behaviour used to attract attention to themselves an</td>
</tr>
<tr>
<td></td>
<td>object or an action.</td>
</tr>
<tr>
<td><strong>Social Function:</strong></td>
<td></td>
</tr>
<tr>
<td>Request information</td>
<td>An utterance or behaviour used to seek knowledge through direct or</td>
</tr>
<tr>
<td></td>
<td>indirect questioning.</td>
</tr>
<tr>
<td>Request clarification</td>
<td>An utterance or behaviour used to seek clarification regarding a message</td>
</tr>
<tr>
<td></td>
<td>that has misunderstood or misheard.</td>
</tr>
<tr>
<td>Provision of information</td>
<td>An utterance or behaviour used comment on people, objects, actions or</td>
</tr>
<tr>
<td></td>
<td>internal states</td>
</tr>
<tr>
<td>Provision of clarification</td>
<td>An utterance or behaviour used to repair own message by repetition or</td>
</tr>
<tr>
<td></td>
<td>revision</td>
</tr>
<tr>
<td>Acknowledgement</td>
<td>An utterance or behaviour used to indicate notice of another’s statement</td>
</tr>
<tr>
<td></td>
<td>or action without requesting or providing any additional information</td>
</tr>
<tr>
<td>Confirm/deny</td>
<td>An utterance or behaviour used to disagree or agree with another’s</td>
</tr>
<tr>
<td></td>
<td>statement or action</td>
</tr>
<tr>
<td>Social/game/routine</td>
<td>An utterance or behaviour used to participate in social, routines,</td>
</tr>
<tr>
<td></td>
<td>greetings or games</td>
</tr>
</tbody>
</table>
Two, of the eight, videos (25%) were randomly selected and double coded by an independent rater, consistent with recommendations from Ostrov and Hart (2014) that between 15% and 30% of observations are coded by more than one observer to determine inter-rater reliability. Cohen’s Kappa is the preferred statistic when calculating inter-rater reliability as it controls for chance agreements; a score of $\kappa .70$ and above was considered to be adequate for the purpose of this study (Ostrov & Hart, 2014). The Cohen’s Kappa was based on a total of 374 observations and calculated to be $\kappa .82$, indicating acceptable inter-rater reliability.

NVivo10 (2012) software was used to code the video recordings. NVivo10 allows for the simultaneous coding of multiple participants across numerous categories of behaviour.

Procedure

Ethics approval was granted by Deakin University Human Research Ethics Committee (see Appendix N). Participants from Study 1 who lived locally and expressed interest in being involved in a follow up study received a phone call invitation from a member of the research team to participate in a follow up study which involved video observations of typical family mealtimes. A phone script was followed (see Appendix O) to ensure recruitment protocols were ethical. Written information, including a Plain Language Statement (see Appendix P), detailing what was involved in participation in the second study and relevant consent forms (see Appendix Q - S) was posted to families who indicated verbal interest. Upon return of signed consent forms from all family members typically present at family mealtimes,
a phone call was made to arrange a visit to the participant’s home at a time convenient to the family.

The researchers demonstrated how to use the recording equipment. An agreement was reached on an appropriate position for the camera in the room in which family meals were typically eaten. The tripod was set up at maximum distance from the table to ensure it did not become the focus of the meal. Caregivers were taught how to start and stop recording and were provided with both verbal and written instructions to ensure a standardised research process was experienced by all participants (see Appendix T). Families were given the option of leaving the equipment set up or setting it up themselves when required. All participants were reminded of issues regarding confidentiality and were ensured that video data files would be stored in a secure location and viewed only by the research team for the purpose of this study. Caregivers were reminded that they were free to withdraw themselves and their children from the study at any time and that they were able to stop the recording, at any stage, if they wished to discontinue.

Two typical meals were recorded in the family home; these took place on either a weekday or weekend. However data was not collected on holidays or on any other day that involved mealtime celebrations (e.g., Christmas, birthdays).

Caregivers were asked to complete a short questionnaire (Appendix U) after each recorded mealtime indicating how typical the mealtime was on a 5 point Likert Scale, with responses ranging from Not Typical at All (1) to Very Typical (5). The questionnaire included three items which asked caregivers to rate how typical the recorded mealtime was overall, in regards to their child’s
behaviour, and their family’s interactions. If participants indicated that any aspect of the family mealtime was “Not at All Typical” or “Somewhat Typical” they were asked to briefly describe how the recorded family mealtime differed from an average family mealtime in their household.

**Design and Analysis**

**Aim 4a: The proportion of directive and social interactions displayed between target children and primary caregivers during mealtimes.** To address this aim, the following coding procedure was undertaken for each of the eight participating families. The families were divided by disability status and level of feeding problem to compare similarities and differences in the proportion of social and directive interactions.

1. **Target Child to Primary Caregiver.**

   All interactions displayed by the target child to their primary caregiver were coded as a directive function (request object/action, protest, request joint attention) or a social function (request information, request clarification, provision of information, provision of clarification, acknowledgement, confirm/deny, social/game/routine). The total number of interactions displayed by the target child to their primary caregiver was calculated by summing the total number of directive functions and the total number of social functions. Percentages were calculated to determine the proportions of the total interactions displayed by the target child to their primary caregivers that had an overall social function and an overall directive function.
2. Primary Caregiver to Target Child.

All interactions displayed by the primary caregiver to their target child were coded as a directive or a social function. The total number of interactions displayed by the primary caregiver to their target child was calculated by summing the total number of directive functions and the total number of social functions. Percentages were calculated to determine the proportion of the total interactions displayed by the primary caregiver to their target child that had an overall social function and the proportion that had an overall directive function.

Aim 4b. The tone and focus of directive and social interactions displayed between family members during mealtimes. This study also included a qualitative component in which themes derived from the content of mealtime interactions were explored and compared to determine if the tone and focus of direct and social mealtime interactions differed according to the above categories of interaction and across groups/families. The data were entered into the qualitative statistical program NVivo - a comprehensive qualitative data analysis software package designed for thematic analysis (Lapadat, 2010).

Directive and social interactions displayed by target children and primary caregivers were broken down into more distinct categories based on the coding system, in order to further explore the theme and focus of mealtime interactions. Percentages were calculated for each of the three types of directive functions, to determine how each was represented within the proportion of overall directive functions (request object/action, protest, and request joint attention). Percentages were calculated for each of the seven types of social functions, to determine how each was represented within the
proportion of overall social functions (request information, request for clarification, provision of information, provision of clarification, acknowledgement, confirm/deny, and social/game/routine). The groups were divided by disability status and level of feeding problem to explore similarities and differences between groups in terms of the themes.
CHAPTER 6

STUDY 2 RESULTS

The results for Aims 4a and 4b are sequentially presented according to the two categories of interaction: 1. from target child to primary caregiver; 2. from primary caregiver to target child. These commence with a description of the proportion of directive and social interactions displayed between target children and primary caregivers (Aim 4a); followed by a discussion of themes relating to the tone and focus of directive and social mealtime interactions and a description of the types of social and directive interactions used by target children and primary caregivers (Aim 4b). Comparisons are made between families of typically developing children and families of children with developmental disabilities both with high and low levels of feeding problems.

1. Target Child to Primary Caregiver.

   **Aim 4a:** The proportion of directive and social interactions displayed between children and caregivers during mealtimes are presented in Table 6.1 and has also been displayed in Figure 6.1 to provide a clear visual comparison of social and directive interactions across groups. As can be seen from Table 6.1 when compared to typically developing children, children with a developmental disability demonstrated a higher percentage of directive functions and a lower percentage of social functions when interacting with caregivers. Specifically directive interactions with caregivers displayed by the children with a developmental disability ranged from 33.3% to 50.0%, compared to a range of 19.7% to 28.9% among the typically developing children.
Table 6.1.

*Target child Interactions with Caregivers: Percentage of Interactions with a Social and Directive Function.*

<table>
<thead>
<tr>
<th>Target Child</th>
<th>Typically Developing</th>
<th>Developmental Disability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Feeding Problem</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Directive</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>19.8</td>
<td>27.8</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>10</td>
</tr>
<tr>
<td>Social</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>80.2</td>
<td>71.4</td>
</tr>
<tr>
<td></td>
<td>73</td>
<td>25</td>
</tr>
<tr>
<td>Total</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>91</td>
<td>36</td>
</tr>
</tbody>
</table>

As can be seen in Table 6.1, comparisons between typically developing children with high and with low levels of feeding problems show few differences in the percentage of social and directive interactions made to caregivers across feeding groups. Comparisons between children with high and low levels of feeding problems and a diagnosed disability show increased variance in percentages of social and directive interactions, however child E, who was reported to have low levels of feeding problems, showed the highest percentage of directive interactions.
Aim 4b. In order to explore the tone and focus of interactions displayed by children to caregivers during mealtimes, directive and social interactions were broken down into more distinct categories based on the coding system (the breakdown of directive interactions is displayed in Table 6.2 and the breakdown of social interactions is displayed in Table 6.3)

Themes from Typically Developing Target Children. Typically developing children with high levels of feeding problems showed a higher percentage of protests when compared to typically developing children with low levels of feeding problems. These observations are not surprising considering that both children with high levels of feeding problems had high levels of food refusal. Child D displayed protests regarding food and protests regarding mealtime behaviour. This included statements such as “I don’t want lettuce” and “I can’t pick it up”. Child C displayed protests verbally (“No”)
and non-verbally (shaking head). Child C made protests to a range of requests, including requests to eat her food, use her utensils correctly and to share with her sibling.

The most common directive interaction observed among typically developing children with low levels of feeding problems was “request for objects or actions”. Request for objects or actions made by child A, included statements to caregivers such as; “I need some cheese in mine” and “I need a knife too”. These directive statements were not perceived to have a negative tone. These observations were consistent with requests for objects or actions made by child B which included statements such as; “More Po (potato)” and “Yogi. Mum Yogi (yoghurt)”.

Table 6.2

Child Directive Interactions with Caregiver; Broken Down Into Percentages Based on Type of Directive Interaction

<table>
<thead>
<tr>
<th>Target Child</th>
<th>Feeding Problem</th>
<th>Typically Developing</th>
<th>Developmental Disability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Low</td>
<td>B</td>
</tr>
<tr>
<td>A</td>
<td>Request obj/act</td>
<td>% 89.9</td>
<td>58.8</td>
</tr>
<tr>
<td>B</td>
<td>Protest</td>
<td>% 5.6</td>
<td>5.8</td>
</tr>
<tr>
<td>C</td>
<td>Request joint att</td>
<td>% 5.6</td>
<td>35.3</td>
</tr>
<tr>
<td>D</td>
<td>Total</td>
<td>% 100</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>18</td>
<td>10</td>
</tr>
</tbody>
</table>
These observations indicated that directive interactions were not always delivered in a way that was considered to be negative and may not impact on the tone of the mealtime. Interestingly child D who was considered to have high levels of feeding problems also displayed a high percentage of “request for objects or actions” however it was noted that many of these requests were made in a negative tone (i.e. “I want milk’ and “give me my fork mummy”).

Compared to other typically developing target children, child B was observed to show a high percentage of requests for attention. This included statements such as “Mummy, Mummy” or “Daddy, Daddy” and were usually followed with a request for food or social interactions. This pattern of interactions may be the result of child D’s age and lower level of verbal abilities and the large size of her family.

**Themes from Target Children with a Developmental Disability.** As evident in Table 6.2, three of the four children with a developmental disability (E, G and H) showed a similar pattern in regards to the type and frequency of directive interactions with their caregiver during the family mealtime. All three children showed infrequent requests for objects/actions, infrequent requests for attention and frequent protests. Child E and H generally displayed protests which were limited to non-verbal interactions (shaking head, turning away) and simple verbal responses (“yuck” or “no”). This may have been a result of limited verbal skills, consistent with a diagnosis of Autism Spectrum Disorder. For example, protests displayed by child H included running away from the table, crying, turning away from food and pushing food off the table. Child H made protests to a number of requests made by his caregiver, this included
requests to sit at the table, to leave food on his plate, to leave his plate on the

table and refusal to touch food that was not pureed.

Table 6.3

*Target Child Social Interactions with Caregiver; Broken Down Into*

*Percentages Based on Type of Social Interaction.*

<table>
<thead>
<tr>
<th>Feeding Problem</th>
<th>Typically Developing</th>
<th>Developmental Disability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Target Child</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>Request clarification</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>Provision of information</td>
<td>2.7</td>
<td>.0</td>
</tr>
<tr>
<td>Provision of clarification</td>
<td>41.1</td>
<td>13.0</td>
</tr>
<tr>
<td>Acknowledgement</td>
<td>4.2</td>
<td>13.0</td>
</tr>
<tr>
<td>Confirm/Deny</td>
<td>8.3</td>
<td>.0</td>
</tr>
<tr>
<td>Self-expression</td>
<td>15.1</td>
<td>39.1</td>
</tr>
<tr>
<td>Social game or routine</td>
<td>12.3</td>
<td>13.0</td>
</tr>
<tr>
<td>Total</td>
<td>%</td>
<td>100</td>
</tr>
<tr>
<td>n</td>
<td>73</td>
<td>25</td>
</tr>
</tbody>
</table>

Similarly, child E displayed limited verbal skills and a high percentage

of protests, which included the child stating “no” or “yuck” to a range of

requests, including requests to eat her food or to sit in her chair. Although child

F displayed few protests, when she did they were typically non-verbal and

consistent with observations within the developmental disability group. Non-

verbal protest consisted of her moving away from food being offered by her
caregiver, or throwing unwanted food on the floor.
Although child G was the eldest child in the developmental disability group, a similar pattern of directive interactions was observed, which was characterised by a high percentage of protests. Protests displayed by child G were generally verbal and more complex than those shown by younger children. For example, this child stated “No, I’m not going to put that there” and “No, I am taking yours” in response to the caregiver’s request regarding the placement of his plate during the mealtime. It was noted that these more complex and argumentative statements from child G resulted in an increase in directive comments from his caregiver.

Overall child F showed a different pattern of directive functions, which was characterised by frequent requests for attention. Child F had a diagnosis of Down syndrome and a high level of physical feeding problems, which included choking, gagging and vomiting, which may contribute to the different pattern of interactions observed. It is important to note that this child had limited verbal communication skills, however she used nonverbal communication effectively at times. Her verbal communication with family members was limited to raising her hands in the air and stating “yay” or “hooray”; she appeared to use these verbal prompts to seek interactions with her caregivers, which typically resulted in imitation back and forwards between caregiver and child. Of further interest, child F displayed a high percentage of requests for joint attention similarly to child B in the typically developing group. Both child F and child B had low verbal skills and older siblings that dominated mealtime interactions which may provide some explanation for the high percentage of “requests for attention” observed.
It was observed that child E displayed the highest percentage of directive interactions of which 81.3% were considered to be protest, with the caregiver endorsing that the videoed mealtime was typical. This result provides an interesting contrast to the findings from the questionnaire data for this child in Study 1, where low levels of overall feeding problems were indicated, including low levels of food refusal. This discrepancy highlights the importance of considering variations in caregiver perceptions and expectations of family mealtimes.

When comparing social interactions between target children and their caregivers, it can be seen that a less diverse range of social functions were used by target children with a developmental disability compared to typically developing target children. This may be a result of the difference in verbal communication skills across groups. It can be observed that the target children with low levels of verbal skills (D, E, and F, H) displayed a limited range of social functions, yet they all displayed high percentages of self-expression. Self-expression was displayed in different ways across target children. Target child F displayed self-expression by raising her hands in the air and stating “yay”. Target children E and H hummed out loud at times and target child D gave her caregivers a high five or declared “ta da”. 
2. Primary Caregiver to Target Child.

Aim 4a. The proportion of directive and social interactions displayed by the primary caregiver to the target child are presented in Table 6.4.

Compared to caregivers of typically developing children, caregivers of children with a developmental disability showed a higher percentage of directive interactions and a lower percentage of social interactions. Specifically, directive interactions displayed by caregivers of target children with developmental disability ranged from 29.6% to 63.5% compared to 12.5% to 28.6% among caregivers of the typically developing children. Conversely, social interactions displayed by caregivers of the children with a developmental disability ranged from 36.6% to 70.4%, compared to 71.4% to 87.5% among caregivers of the typically developing children. However, caregiver F displayed a pattern of interaction that was comparable to those observed among caregivers of the typically developing children, with the majority of interactions being social (70.4%) rather than directive (29.6%). As mentioned previously, child F displayed high levels of physical feeding problems rather than behavioural feeding problems, which may have contributed to differences in caregiver interactions.

As can be seen in Table 6.4, comparisons between caregivers of typically developing children with high and with low levels of feeding problems displayed few differences in the percentage of social and directive interactions made to caregivers across feeding groups. Comparisons between caregivers of children with high and with low levels of feeding problems and a diagnosed disability showed increased variance in percentages of social and directive interactions, however no clear pattern was observed across low and
high feeding problem groups. Of interest, caregiver G and H both had children with high levels of behavioural feeding problems, such as mealtime aggression and food refusal and showed higher levels of directive comments, when compared to caregiver E who had a child with high levels of physical feeding problems such as choking, gagging and vomiting. Additionally, caregiver E displayed a high levels of directive interactions (55.0%) which may be the result of high levels of protest displayed by her child, but was in contrast to reports in study 1 that her child had low levels of feeding problems.

Table 6.4.

*Primary Caregiver Interactions with Target Child; Percentage of Interactions with a Social and Directive Function*

<table>
<thead>
<tr>
<th>Target Child</th>
<th>Feeding problem</th>
<th>Typically Developing</th>
<th>Developmental Disability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>A</td>
<td>12.5</td>
<td>28.6</td>
<td>22.2</td>
</tr>
<tr>
<td>B</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Primary Caregiver*

<table>
<thead>
<tr>
<th></th>
<th>Directive</th>
<th>Social</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>Directive</td>
<td>12.5</td>
<td>87.5</td>
</tr>
<tr>
<td>n</td>
<td>8</td>
<td>57</td>
</tr>
<tr>
<td>Social</td>
<td>28.6</td>
<td>71.4</td>
</tr>
<tr>
<td>n</td>
<td>10</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>22.2</td>
<td>77.7</td>
</tr>
<tr>
<td>n</td>
<td>33</td>
<td>115</td>
</tr>
<tr>
<td></td>
<td>13.8</td>
<td>86.3</td>
</tr>
<tr>
<td>n</td>
<td>22</td>
<td>138</td>
</tr>
<tr>
<td></td>
<td>55.0</td>
<td>45.0</td>
</tr>
<tr>
<td>n</td>
<td>11</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>29.6</td>
<td>70.4</td>
</tr>
<tr>
<td>n</td>
<td>24</td>
<td>57</td>
</tr>
<tr>
<td></td>
<td>63.5</td>
<td>36.6</td>
</tr>
<tr>
<td>n</td>
<td>92</td>
<td>53</td>
</tr>
<tr>
<td></td>
<td>48.6</td>
<td>51.4</td>
</tr>
<tr>
<td>n</td>
<td>71</td>
<td>75</td>
</tr>
</tbody>
</table>

The relative proportions of social and directive interactions provided important comparative information. However, the actual frequency (number of occurrences) also provided valuable information regarding caregiver
interactions. Although it was not an initial aim of Study 2, it was noted that caregivers of children with high levels of feeding problems showed a higher frequency of overall interactions when compared to caregivers of children with low levels of feeding problems. This pattern was noted among caregivers of both typically developing children and children with developmental disability. Across both groups, caregivers of children with high levels of feeding problems contributed more than twice as many interactions than caregivers of children with low levels of feeding problems. These findings are important to consider as they suggest that caregivers of children with high levels of feeding problems dominate mealtime interactions, when compared to caregivers of children with low levels of feeding problems.

Figure 6.2 Primary Caregiver Interactions with Target Child;
Percentage of Interactions with a Social and Directive Function.
Aim 4b. In order to explore the tone and focus of interactions displayed by caregivers to children during mealtimes, directive and social interactions were broken down into more distinct categories based on the coding system (the breakdown of directive interactions is displayed in Table 6.5 and the breakdown of social interactions is displayed in Table 6.6).

Themes from Primary Caregivers of Typically Developing Children.

Low level feeding problem: Observations revealed that caregivers of typically developing children with low levels of feeding problems showed few directive interactions overall, with caregiver A displaying a total of 8 directive interactions and caregiver B displaying a total of 10. Protests displayed by caregiver A and B generally consisted of reminders regarding mealtime behaviour and were not delivered with a negative tone (primary caregiver A; Oh no, don’t have bad manners please; primary caregiver B; Oh no, don’t spit honey). Requests for objects or actions generally consisted of positive reinforcement and encouragement regarding eating (primary caregiver A; Eat some more; primary caregiver B; You do it now). These observations suggested that caregivers of typically developing children with low levels of feeding problems tended to use directive interactions in a positive way to encourage appropriate mealtime behaviour.
Table 6.5.

*Primary Caregiver Directive Interactions with Target Child; Broken Down Into Percentages Based on Type of Directive Interaction*

<table>
<thead>
<tr>
<th>Feeding Problem</th>
<th>Typically Developing</th>
<th>Developmental Disability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Target Child</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>Request obj/act</td>
<td>%</td>
<td>25.0</td>
</tr>
<tr>
<td>Protest</td>
<td>%</td>
<td>75.0</td>
</tr>
<tr>
<td>Request joint att</td>
<td>%</td>
<td>.0</td>
</tr>
<tr>
<td>Total</td>
<td>%</td>
<td>100</td>
</tr>
<tr>
<td>n</td>
<td></td>
<td>8</td>
</tr>
</tbody>
</table>

When the social interactions were observed from caregiver A to her child, it could be seen that the majority of social interactions were considered to be requests for information or provisions of information. Caregiver A asked her child questions regarding events unrelated to mealtimes including “Did you see friends today?” and “Is that your favourite movie?” and provided her child with information such as “it’s your birthday in two weeks” and “it’s called the mandarin peel or the skin”. When the social interactions were observed from caregiver B to her child, it could be seen that the majority of social interactions were considered to be acknowledgements and provisions of information. This different pattern of interactions may have been due to the younger age of child B and limited verbal skills. Provisions of information included comments such as “You had a play at the gym and then you had a little sleep in the car” and were usually part of a whole family discussion. Acknowledgements included
further reinforcing and encouragement regarding eating, such as “good girl” and “yum yum”.

Table 6.6.

*Primary Caregiver Interactions with Target Child; Broken Down Into Percentages Based on Type of Social Interaction.*

<table>
<thead>
<tr>
<th>Feeding Problem</th>
<th>Typically Developing</th>
<th>Developmental Disability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Target Child</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>Request information</td>
<td>% 30.4</td>
<td>20.0</td>
</tr>
<tr>
<td>Request clarification</td>
<td>% 1.8</td>
<td>4.0</td>
</tr>
<tr>
<td>Provide information</td>
<td>% 32.1</td>
<td>24.0</td>
</tr>
<tr>
<td>Provide clarification</td>
<td>% 1.8</td>
<td>0.0</td>
</tr>
<tr>
<td>Acknowledgement</td>
<td>% 16.1</td>
<td>36.0</td>
</tr>
<tr>
<td>Confirm/deny</td>
<td>% 5.4</td>
<td>0.0</td>
</tr>
<tr>
<td>Self-expression</td>
<td>% 3.6</td>
<td>12.0</td>
</tr>
<tr>
<td>Social game/routine</td>
<td>% 8.9</td>
<td>4.0</td>
</tr>
<tr>
<td>Total</td>
<td>% 100</td>
<td>100</td>
</tr>
<tr>
<td>n</td>
<td>57</td>
<td>25</td>
</tr>
</tbody>
</table>

*High level feeding problem:* Caregivers of typically developing children with high levels of feeding problems showed more frequent use of directive interactions when compared to caregivers of typically developing children with low levels of feeding problems. Closer review of the directive interactions observed from caregivers of typically developing children with high levels of feeding problems revealed that both caregivers displayed high
percentages of requests for objects/actions and few protests. Both caregivers
generally requested that her child display a desirable behaviour rather than ask
them to cease an undesirable one. For example, when her daughter was
scratching the table with her fork caregiver C responded with;

Primary Caregiver C: *Do you need to have a baby fork?*
Target Child C: *No*
Primary Caregiver C: *Use your big girl fork. Show me how you do it.*

When the social interactions were observed among caregivers of
typically developing children with high levels of feeding problems it was
observed that many provisions of information were comments related to the
mealtime rather than external events. For example, provisions of information
displayed by caregiver C included comments such as "*There are more beans
in your bowl*“and “*Forks are tricky when they are small*”. Similarly,
provisions of information displayed by caregiver D consisted of “*You know
that this is how Claire eats her Taco too*” and “*Now remember, Papa loves
these, but they are messy*”. Although these provisions of information were
social interactions, they also appeared to be a strategy used to encourage their
child to eat. Acknowledgements were also used by both caregiver C and D that
encouraged their child and provided positive reinforcement for mealtime
behaviour (i.e. “*oh awesome*” and “*such a good job*”). Once again although
these interactions were not directive they were often used as a means to distract
or encourage their child to consume food.

Despite these observations, both caregiver C and D engaged in social
interactions unrelated to mealtimes. For example, caregiver D made
provisions of information including comments unrelated to mealtimes such as
“*Because the baseball went woooosh and broke his helmet*” and “*I hope we
can go to the beach tomorrow” and caregiver D made comments such as “Did you tell Dad that your puppy came into your room when you were having a sleep”. However it was noted that within families of children with high levels of feeding problems, social interactions focused more on mealtime information and events rather than topics external to the mealtime.

Themes from Primary Caregivers of Children with a Developmental Disability. Great variation was observed in the interactions used by caregivers of children with a developmental disability, which may be a result of the wide range of types of feeding problems observed and the range of abilities. For example, caregiver F displayed a low percentage and a low frequency of directive interactions when compared to other caregivers of children with a developmental disability. This may be a result of low levels of behavioural feeding problems and high levels of physical feeding problems displayed by her child. When considering the type of directive interactions used it was clear the majority used by caregiver F were requests for objects/actions. Review of the videos revealed that many directive interactions displayed by caregiver F were directing her child to eat through the use of a positive/encouraging tone. For example: Primary Caregiver F: Eat, Eat, Nom, Nom.

It was noted that among caregivers of children with developmental disability and high levels of behavioural feeding problems, that directive interactions were used in a range of ways. For example, caregiver G displayed the highest percentage of directive interactions which were characterised by numerous protests and requests for actions/objects. Many of the directive interactions observed were part of an argument with her child, and it was noted
that many directive interactions were delivered in a negative rather than an encouraging tone.

Target Child G: *I am moving my chair to that side*
Primary Caregiver G: *No you are not, no you are not*
Target Child G: *Yes*
Primary Caregiver G: *You are going to eat your dinner*
Primary Caregiver G: *You are not moving to there*
Primary Caregiver G: *Stop*
Target Child G: *moves chair*
Primary Caregiver G: *If I wanted you to sit there*
Primary Caregiver G: *I would have put your chair there*
Primary Caregiver G: *I put your chair there for you to eat*
Primary Caregiver G: *Now eat please*

These directive interactions were a great contrast to the directive interactions used by caregiver H who also had a child with a developmental disability and high levels of behavioural feeding problems. It was noted that many of these directive interactions use by caregiver H were “requests for objects of actions” and were used an educative way to teach her child mealtime behaviour skills.

Primary Caregiver H: *That’s ok, pick it up*
Target Child H: *Bee bee bee (crying)*
Primary Caregiver H: *Just stab it. Look take this one and stab it*
Primary Caregiver H: *That’s right, stab this one*
Primary Caregiver H: *That’s right, then you don’t have to touch it*

These observations were consisted with observations made within the typically developing group and revealed that directive interactions had a range of different functions, which included encouragement to eat, teaching of mealtime expectations, teaching of feeding skills and arguments regarding food and mealtime behaviour.
When comparing social interactions among caregivers of children with developmental disabilities a similar theme was observed, in which caregivers of children with high levels of behavioural feedings problems engaged in a range of social interactions regarding mealtimes and fewer social interactions regarding external events. For example, provisions of information made by caregiver H included statements such as “it’s just your normal fruit” and requests for information included “Where is the strawberry?” Similarly, caregiver H made provisions of information such as “We are eating dinner now that is what we are doing” and “It tastes like mint” Although these interactions were coded as “social” they also appeared to have a directive tone and were often focused on mealtimes.

Caregiver E displayed a high percentage of directive interactions, and used a combination of directive interactions which included, protests, requests for objects/actions and requests for joint attention. Below is an example of caregiver E interacting with her child;

Target Child E: A bit yuck
Primary Caregiver E: It’s not a bit yuck, you haven’t even tried it.
Target Child E: Nup
Primary Caregiver E: Jack is eating his, why don’t you just try a really little bit

Of interest, the number of interactions in this mealtime were limited compared to other families, and it was observed that, overall, few social or directive interactions were made during the family meal. Caregiver E engaged in little directive or social interactions with her child and allowed her child to leave the table when she would not eat. It was also noted that caregiver E scored the lowest on the Parent Stress Index when compared to other
caregivers of children with a developmental disability. This may have contributed to her management of child E during the family mealtime and her perception that she had low levels of feeding problems despite observations that she actually displayed high percentages of directive interactions including high percentages of protests.
CHAPTER 7
DISCUSSION

Organisation of the Chapter

This chapter provides an integrated discussion of the findings from Study 1 and Study 2, structured according to the aims. It includes the contribution of these preliminary findings to what is already known from the empirical literature on the impact of feeding problems on parent stress, mealtime interactions and mealtime socialisation, among typically developing children and children with developmental disabilities. Implications for theory, research and intervention in the area of feeding problems among typically developing children and children with developmental disabilities will be explored, and the limitations of the study will be discussed. Recommendations for future research will be reviewed, concluding with a brief summary of the unique findings of the thesis.

1. Parent stress

Aim 1a: The impact of developmental disabilities and feeding problems on parent stress. The impact of developmental disabilities and feeding problems on parent stress is discussed in the context of the current literature. This is followed by a discussion of how the results of this study add to the current literature and how the additional pressures arising from a child with feeding problems may impact on levels of stress among caregivers of children with a developmental disability.

As demonstrated by a strong significant main effect for disability status, caregivers of children with developmental disabilities reported higher levels of overall parent stress than caregivers of typically developing children.
These results were consistent across all three sub-categories of the parent stress index (parent distress, parent-child dysfunctional interaction, difficult child) and support previous research indicating that caregivers of children with developmental disabilities report higher levels of parent stress than caregivers of typically developing children (Baker, Blacher, Crnic, & Edelbrock, 2002; Britner et al., 2003; Fidler et al., 2000; Johnston et al., 2003). These findings continue to highlight the elevated levels of stress displayed by caregivers of children with a range of developmental disabilities.

As demonstrated by a significant main effect for feeding problems, children with high levels of feeding problems (as determined by the total MBQ score; Berlin et al., 2010), reported higher levels of parent stress than caregivers of children with low levels of feeding problems. This finding was consistent across all three sub-categories of the parent stress index (parent distress, parent-child dysfunctional interaction, difficult child). These findings concur with the array of previous studies demonstrating high levels of parent stress in parents of children with a variety of feeding problems (Adams et al., 1999, Garro et al., 2005, Greer et al., 2008, Secrist-Mertz et al., 1997, Sullivan et al., 2000).

As demonstrated by the significant interaction between disability status and the level of feeding problem, parent stress was most pronounced in caregivers of children with a developmental disability and high level of feeding problem. This is not surprising, given that parent stress was greater in caregivers of children with feeding problems and caregivers of children with developmental disabilities. These findings are consistent with previous research indicating that many caregivers of children with feeding problems and
co-morbid medical and developmental conditions display extremely high rates of parenting stress (Pagano, 2000; Fishbein et al., 2014). The findings contrast those of Adams et al. (1999) where increased levels of stress were not evident in mothers of children with developmental disabilities and feeding problems compared to mothers of children with developmental disabilities and no feeding problems. However, as the children ranged from 5 to 17 years of age in Adam et al.’s study, it is possible that parent responsibility for feeding was reduced due to the increased independence of their children.

The effect that feeding problems had on parent stress was greater for caregivers of children with developmental disabilities than for caregivers of typically developing children, however, when parent stress was broken down according to the subscales of the Parent Stress Index, a significant interaction was only present for one of the three subscales. Specifically, the impact of feeding problems on the “difficult child” subscale scores was greater among caregivers of children with developmental disabilities than caregivers of typically developing children. This scale indicates how difficult a parent perceives their child to be and is often associated with difficulties in self-regulation and in managing behaviour (Albidin, 1995). These findings highlight the importance of considering the role of disruptive mealtime behaviours that are often associated with feeding problems among children with developmental disabilities (Burklow et al., 1998).

The finding that feeding problems had a greater impact on parent stress among caregivers of children with developmental disabilities is concerning, given the high prevalence of feeding problems in this cohort (Burklow et al., 1998) and the strong evidence that caregivers of children with developmental
disabilities show high levels of parent stress (Baker et al., 2002; Britner et al.,
2003; Fidler et al. 2000; Johnston et al., 2003). High levels of parent stress
experienced by caregivers of children with co-morbid developmental
disabilities and feeding problems, need to be further explored, given the
negative impact of parent stress on interactions of a positive nature, leading to
negative developmental outcomes among young children (Cowen, 1998;
Deater-Deckard & Scarr, 1996; Powers et al., 2002; Turner et al., 1994). These
findings are of particular concern, given that enhancing learning opportunities
is particularly important among children with developmental disabilities, as
they need additional time, repetition and encouragement to acquire and practise
skills, when compared to their typically developing peers (Horn et al., 2002).
The clinical implications of these findings and directions for future research
will be discussed at the conclusion of this chapter in the context of the overall
findings of the study.

Previous research has predominantly focused on parent stress reported
by caregivers of children with severe disabilities and complex mealtime
behavioural issues (Adams et al., 1999; Garro et al., 2005; Sullivan et al.,
2000). Relatively little focus has been directed towards more typical and often
more transient mealtime feeding problems. Therefore the thesis extended this
literature by highlighting the additional impact of feeding problems on parent
stress experienced by caregivers of children with developmental disabilities.
However, as the measure of overall feeding problems utilised in this study
incorporated a range of feeding problems (food refusal, mealtime aggression,
choking/gagging and vomiting and food manipulation), a subsequent aim was
to determine how different types of feeding problems impact on parent stress
among caregivers of typically developing children and children with
developmental disabilities.

**Aim 1b: The types of feeding problems that predict parent stress**

and the impact of developmental disability. After consideration of the types
of feeding problems (food refusal, mealtime aggression, food manipulation and
choking/gagging and vomiting) that predict parent stress, discussion will be
presented on how the relationship between types of feeding problems and
parent stress differed between caregivers of typically developing children and
caregivers of children with a developmental disability.

The model, which included all four subscales of the MBQ, significantly
predicted 34% of the variance in parent stress (as measured by the Total Parent
Stress Index score). These results are not surprising, given that caregivers of
children with high levels of feeding problems reported significantly higher
levels of parent stress than caregivers of children with low levels of feeding
problems. However, certain types of feeding problems appeared to have a
greater effect on parent stress than others.

Measures of food refusal and mealtime aggression made a significant
contribution to the prediction of parent stress, specifically, higher levels of
food refusal and mealtime aggression were associated with higher levels of
parent stress. Measures of food manipulation and choking/gagging and
vomiting did not, however, make a significant contribution to the prediction of
parent stress. The relationship between each individual type of feeding
problems and parent stress was consistent across caregivers of typically
developing children and caregivers of children with a developmental disability,
as shown by a series of four moderating regressions.
These findings are particularly interesting, as measures of food manipulation and choking/gagging/vomiting, which reflect more serious or physical feeding problems, were not significant predictors of parent stress. It should be noted that the choking/gagging/vomiting variable just fell shy of significance ($p=.06$), suggesting a non-significant trend, however food refusal and mealtime aggression were stronger predictors of parent stress. These findings add to research that physical feeding problems, such as swallowing, (Sullivan et al., 2000) oral motor dysfunction and tonal abnormalities (Garro et al., 2005) were associated with increased parent stress, and suggest that secondary mealtime behaviour problems, associated with more severe feeding problems, may play a significant role in parent stress experienced by caregivers.

The significant contribution to the prediction of parent stress, made by food refusal and mealtime aggression, support findings that behavioural feeding problems demonstrate a relationship with parent stress, despite the presence of developmental disabilities and serious feeding problems such as tube and liquid dependence (Greer et al., 2008; Secrist-Mertz et al., 1997). The finding that mealtime aggression was the strongest predictor of parent stress is of particular relevance to the disability cohort, as up to 85% of children with developmental disabilities display disruptive mealtime behaviours, which are considered as secondary to feeding problems (Burklow et al., 1998; Luiselli, 1989). This suggests that the increased stress experienced by caregivers of children with developmental disabilities and feeding problems may be more significantly impacted by secondary behaviour problems than by feeding problems alone.
Interestingly, food refusal and mealtime aggression were also found to significantly predict parent stress among primary caregivers of typically developing children. Although the current study focused on feeding problems within the developmental disability cohort, these results emphasise the relationship between disruptive mealtime behaviours and overall parent stress. These findings are useful to help guide interventions aimed at reducing parent stress in both caregivers of typically developing children and children with a developmental disability, and highlight the importance of considering the impact of disruptive mealtime behaviour.

As causation cannot be determined in cross-sectional research, it is important to consider the potential bi-directionality of the link between parent stress and disruptive mealtime behaviour, as disruptive mealtime behaviour may lead to increased parent stress, which subsequently leads to ineffective behaviour management and increased disruptive mealtime behaviour (Anthony et al., 2005; Neece et al., 2012). This further highlights the importance of considering and addressing parent stress when working with families of children with disruptive mealtime behaviours.

2. Negative Mealtime Interactions.

**Aim 2a: The impact of developmental disabilities and feeding problems on negative mealtime interactions.** In this section, the differences in negative mealtime interactions across caregivers of typically developing children and caregivers of children with a developmental disability are discussed. This is followed by consideration of differences in negative mealtime interactions across caregivers of children with high and low levels of feeding problems.
To our knowledge, this is the first study to compare levels of negative mealtime interactions across caregivers of typically developing children and primary caregivers of children with a developmental disability. As demonstrated by a significant main effect for disability status, negative mealtime interactions were higher among caregivers and children with developmental disabilities than caregivers and typically developing children. This suggests that children with developmental disabilities are at increased risk of experiencing mealtime environments that do not optimize the developmental and social benefits that mealtimes potentially have to offer. According to Dunst et al. (2000), learning and development in young children is enhanced through the positive and reciprocal interactions and experiences presented to them in everyday routines, such as mealtimes. These findings therefore have enhanced significance among children with developmental disability as they commonly require frequent and repeated opportunities to practise and acquire new skills (Dunst et al.). The findings, that children with developmental disabilities had increased levels of negative mealtime interactions, provide preliminary evidence that children in this vulnerable group, who require increased opportunities to learn new skills, may not be exposed to mealtime environments that optimize leaning and development opportunities. Given the significant amount of time families devote to mealtimes (Baxter, 2007), and the numerous social and developmental benefits that mealtimes have to offer (Spagnola & Fiese, 2007), this is an important area for future research.

As demonstrated by a significant main effect for feeding problems, caregivers of children with high levels of feeding problems (as determined by
the total MBQ score) reported higher levels of negative mealtime interactions than caregivers of children with low levels of feeding problems. These findings are consistent with the research indicating that negative mealtime interactions are associated with feeding problems such as picky eating (Burnier et al., 2011; Mascola et al., 2010; van der Horst, 2012) and poor food acceptance (Johnson & Harris, 2004). However, previous research is limited, and available studies have focused on a narrow range of feeding problems. The current study has therefore expanded on this literature by examining which specific types of feeding problems are predictive of negative mealtime interactions (Aim 2b).

As there was no significant interaction between disability status and the level of feeding problem, the association between feeding problems and negative mealtime interactions was no greater among caregivers of children with developmental disabilities than caregivers of typically developing children. However, this is still an important area of research given the high incidence of feeding problems among children with development disabilities and the findings from the current study that all children with high levels of feeding problems were exposed to higher levels of negative mealtime interactions.

The finding, that feeding problems were associated with negative mealtime interactions, consistently across feeding problem and disability status groups in the current study appears inconsistent with the findings that feeding problems had a greater impact on parent stress among caregivers of children with developmental disability than those of typically developing children. Although high levels of parent stress are associated with negative parent child interactions (Craig et al., 2003; Powers et al., 2002), these findings are not
surprising given that a range of child (Burnier et al., 2011; Mascola et al., 2010; van der Horst, 2012) and parent characteristics (Drew, 2004) are thought to contribute to negative mealtime interactions. Aim 2b investigated this area further by determining how a range of caregiver and child characteristics impacted on levels of negative mealtime interactions.

Aim 2b: Aspects of the mealtime environment that predict negative mealtime interactions and the impact of developmental disability.

Aspects of the mealtime environment. This section commences with an overview of those aspects of the mealtime environment (mealtime socialisation, parent stress, feeding problems, parent control of eating and child control of eating) which impacted on the level of negative mealtime interactions reported by caregivers. This is followed by discussion of how the relationship between aspects of the mealtime environment and negative mealtime interactions differed between primary caregivers of typically developing and caregivers of children with a developmental disability.

The model, proposed to predict negative mealtime interactions, explained 51% of the variance in negative mealtime interactions, and all five aspects of the mealtime environment were found to uniquely predict negative mealtime interactions. Negative mealtime interactions were characterised by high levels of parent stress, feeding problem, parent control of intake, low levels of mealtime socialisation, and caregiver perceptions that their child could control their own intake.

Moderating regressions revealed that the individual impact of the aspects of the mealtime environment on negative mealtime interactions was relatively consistent across the developmental disability and typically
developing groups. However, the impact of feeding problems (as measured by the Total MBQ score) on negative mealtime interactions was significantly different across caregivers of children with a developmental disability and caregivers of typically developing children; disability status accounted for only 2% of the variability in negative mealtime interaction scores. Therefore differences across groups were negligible and were not considered to be clinically meaningful.

Parent stress was the strongest predictor of negative mealtime interactions, with high levels of parent stress predicting high levels of negative mealtime interactions. These results provide further support for the contention that caregiver characteristics may play a greater role in negative interactions than the characteristics of the child (Drew, 2004; Toyama & Muto, 1990). The findings of this thesis are consistent with previous findings that high levels of parent stress can adversely influence caregiver-child interactions outside of the mealtime environment (Craig, et al., 2003; McKay et al., 1996; Powers et al., 2002) and support findings that parent stress has a similar influence on caregiver-child interactions within the mealtime environment (Drew, 2004).

The current results support Drew’s (2004) finding that mothers of typically developing children with high levels of daily stress have significantly less frequent and less positive mealtime conversations with their child than mothers with low levels of daily stress. The results add to the previous findings, however, by indicating that a similar pattern is occurring among caregivers of children with a developmental disability. The indication that high levels of parent stress are impacting on positive mealtime interactions is particularly relevant within the disability domain, given that mealtimes can
foster relationships and emotional connectedness and provide learning opportunities that encourage independence and facilitate progress across a range of developmental domains (Spagnola & Fiese, 2007). The results provide preliminary support to the recommendation that parent stress is addressed in interventions that focus on enhancing positive mealtime interactions.

Mealtime practices that were controlling in nature were also significant predictors of negative mealtime interactions, irrespective of the presence of developmental disability. More specifically, high levels of parent control and low levels of child control over eating predicted high mealtime negativity. These results support findings that controlling mealtime practices lead to negative mealtime interactions and result in significantly more negative comments from the child, such as “I hate it” and “I don’t want to drink it” (Galloway et al., 2006). They also support the findings from previous research that parental pressure to eat is associated with low levels of eating enjoyment (e.g., Van der Horst, 2012). It is thus suggested, from the results, that children with feeding problems may be missing out on positive mealtime interactions, at least in part, due to controlling caregiver feeding practices. This may be particularly important, given the possibility that controlling feeding practices can exacerbate feeding problems (Galloway et al., 2006).

Low levels of mealtime socialisation were a significant predictor of negative mealtime interactions, although there is little research regarding the role of mealtime socialisation in negative mealtime interactions. This finding supports those of Burnier et al. (2011) and Mascola et al. (2010) that negative mealtime interactions are characterised by low levels of positive social
mealtime interactions and suggest that education regarding the importance of mealtime socialisation may result in more positive mealtime interactions.

Although parent stress was the strongest predictor of negative mealtime interactions, feeding problems (as measured by the Total MBQ score) were the second strongest predictor of negative mealtime interactions, irrespective of the presence of developmental disability. Specifically, high levels of feeding problems were predictive of high levels of negative mealtime interactions. These findings support the literature which demonstrates a link between feeding problems and negative mealtime interactions (Burnier et al., 2011; Mascola et al., 2010). As previous research is limited, and the association between feeding problems and negative mealtime interactions is not properly understood, further analyses were therefore conducted to more fully understand the types of feeding problems that may predict negative mealtime interactions.

*Subscales of the Mealtime Behaviour Questionnaire (MBQ).* In this section, discussion is provided on which different types of feeding problems (food refusal, mealtime aggression, food manipulation and choking/gagging and vomiting) demonstrated a relationship with negative mealtime interactions. This is followed by consideration of how the relationship between types of feeding problems and negative mealtime interactions differs between caregivers of typically developing children and caregivers of children with a developmental disability.

The model, which included all four subscales of the MBQ, significantly predicted 32% of the variance in negative mealtime interactions. These results are not surprising, given that feeding problems (as measured by
the Total MBQ score) were a significant predictor of negative mealtime interactions. However, certain types of feeding problems appeared to have a greater effect on negative mealtime interactions than others.

Measures of food refusal and mealtime aggression made a significant contribution to the prediction of negative mealtime interactions, specifically, higher levels of food refusal and mealtime aggression were associated with higher levels of negative mealtime interactions. In contrast, measures of food manipulation and choking/gagging and vomiting did not significantly contribute to the prediction of negative mealtime interaction.

Moderating regressions revealed that the individual impact of 3 of the MBQ subscales (food refusal, mealtime aggression and, choking, gagging and vomiting) on negative mealtime interactions was significantly different across caregivers of children with a developmental disability and caregivers of typically developing children. However, for each of the 3 subscales, disability status accounted for less than 3% of the variability in negative mealtime interaction scores. Therefore, differences in the relationships between each individual type of feeding problems and negative mealtime interactions, were considered to be relatively consistent across primary caregivers of typically developing children and primary caregivers of children with a developmental disability.

Within this thesis, high levels of food refusal were associated with high levels of negative mealtime interactions. This is consistent with previous findings that parents of picky eaters reported higher levels of negative mealtime interactions than parents of non-picky eaters (Burnier et al., 2011; Mascola et al., 2010). In these studies, the parents of children with picky eating
specifically reported that mealtimes were frequently unpleasant, with frequent arguments and fewer opportunities to speak. Together, these findings suggest that the association between behavioural feeding problems and negative mealtime interactions may have been relatively overlooked in the research to date, while more severe feeding problems have dominated the research in this area.

The finding that high levels of mealtime aggression were also predictive of high levels of negative mealtime interactions, suggests that disruptive mealtime behaviours may also play an important role in negative mealtime interactions among children with feeding problems. This finding adds to previous findings that severe and relational feeding problems impact on child-caregiver interactions (Atzaba-Poria et al., 2010; Feldman, Keren, Gross-Rozal, & Tyano, 2004) and supports the suggestion that disruptive mealtime behaviour may be impacting on child-caregiver interactions in a secondary role (Luiselli, 1989).

These findings add to the limited research regarding the association between feeding problems and mealtime interactions and provide preliminary evidence that, at least in some children, disruptive mealtime behaviours may be playing a more significant role in negative mealtime interactions than more severe or physical feeding problems. Considering claims that caregiver-child interactions need to be filled with positive and reciprocal interactions in order for learning opportunities to be optimal (e.g., Dunst et al., 2001), together with findings that up to 85% of children with developmental disabilities display disruptive mealtime interactions (Burklow et al., 1998), it would seem that
further research is required to determine the role that feeding problems play in negative mealtime interactions.

3. Mealtime Socialisation:

Aim 3: The impact of developmental disabilities and feeding problems on mealtime socialisation. In the following section, the differences in mealtime socialisation across caregivers of typically developing children and caregivers of children with a developmental disability are discussed. Neither the presence of developmental disabilities nor the presence of feeding problems impacted on levels of mealtime socialisation as measured by the Mealtime Socialisation subscale from the Toddler Parent Mealtime Behaviour Questionnaire (Stommel et al., 2008). These results contrasted with the findings of Burnier et al. (2011) that feeding problems resulted in decreased mealtime socialisation resulting from frequent arguments and fewer opportunities to speak.

However, further consideration of the mealtime socialisation subscale from the TPMBQ (Stommel et al., 2008) indicated that it may have captured the frequency of mealtime socialisation rather than its quality or the developmental value. Considering the important role of mealtime socialisation in the development of language and social skills, it was decided to further explore the construct through a second more focused study.

Aim 4a: The proportion of directive and social interactions displayed between target children and primary caregivers during mealtimes. In Study 2, in contrast to the findings from Study 1, caregivers of children with a developmental disability displayed a higher percentage of directive interactions and a lower percentage of social interactions than
caregivers of typically developing children. However, the proportion of social and directive interactions displayed by caregivers to their children in Study 2, did not differ across high and low feeding problem groups. A similar pattern of interactions was observed when considering interactions from children to their caregivers. In that, children with developmental disabilities tended to show a higher percentage of directive interactions and a lower percentage of social interactions when compared to typically developing children, however, no clear trend was observed across children with high and low levels of feeding problems. As Study 2 comprised of only eight families, it is not possible to ascertain the representativeness of these findings.

Of interest, caregivers of children with developmental disabilities and high levels of behavioural feeding problems showed higher levels of directive interactions than the caregiver of a child with a developmental disability and high levels of physical feeding problems. These findings must also be considered cautiously, but can serve to promote further research into these patterns.

It was apparent, from observations made in Study 2 that caregivers of children with high levels of feeding problems contributed more overall interactions compared to primary caregivers of children with low levels of feeding problems. These results were consistent across typically developing children and children with developmental disabilities. Although this was not an initial aim of Study 2, these observations add to the current literature, where it is suggested that mealtimes for children with feeding problems and developmental disabilities present distinct and often narrow communication possibilities (Bailey et al., 1983; Morris, 1981).
These observations are in contrast to studies of children with cerebral palsy, which indicated that mothers dominated mealtime interactions irrespective of the child’s levels of feeding difficulty (Olrick et al., 2002; Veness & Riley, 2007). Specifically, in this study, it was observed that caregiver communication was increased in the high feeding problem group rather than the developmental disability group. Caregivers of children with high levels of feeding problems tended to show increased communication and focus on care giving aspects of feeding rather than social aspects of mealtime than those of children with low levels of feeding problems, highlighting the importance of encouraging mealtime interactions that are responsive to child initiated behavior and that give children the opportunity to practice and build on skills (Dunst, 2005; Guralnick, 2005).

**Aim 4b. The tone and focus of directive and social interactions displayed between family members during mealtimes.** Although comparisons across caregivers of children with high and low levels of feeding problem, showed few differences in the proportion of social and directive interactions used (Aim 4b). Thematic analysis of social interactions indicated that primary caregivers of children with high levels of behavioural feeding problems \((n = 4)\) tended to engage in more social interactions that were related to immediate mealtime issues and appeared to be used indirectly to encourage their child to eat. This included comments such as “You know that this is how Claire eats her Taco too” and “Forks are tricky when they are small”.

In contrast, caregivers of children with low levels of feeding problems \((n = 3)\) tended to engage in more social interactions regarding a variety of personal topics that extended beyond the present mealtime issues. This
included interactions such as “Did you see friends today?” and “Is that your favourite movie?” Although these findings have limited generalisability owing to the small sample size, they provide preliminary evidence that, among children with feeding problems, mealtimes may be focused on care giving aspects of feeding rather than the social aspects of mealtimes. Adding to literature that mealtime conversations are not limited to exchanges regarding the mealtime and often extend to include conversations about family members, friends, commenting on the past and planning for the future, by suggesting that this pattern of interactions may be interrupted by feeding problems (Beals & Snow, 2002; Davidson & Snow, 1996).

Thematic analysis of the videotaped family mealtimes indicated that directive interactions were not always delivered in a negative tone and high frequencies of directive interactions may not be indicative of negative mealtime interactions. Observations across all eight families indicated that directive interactions had a range of different functions, including encouragement to eat, teaching of mealtime expectations, teaching of feeding skills and arguments regarding food and mealtime behaviour.

The observations undertaken in Study 2 of this thesis support previous findings that mealtime interactions between a child with cerebral palsy and her caregiver may be predominantly focused on the management of mealtime behaviour and feeding assistance, in contrast, interactions between the typically developing child and her caregiver included conversations regarding a variety of personal topics that extended beyond the present mealtime (Ferm et al., 2005; Ferm et al., 2012). The findings from the current study suggest that this pattern of interaction may extend to caregivers and children with a
range of feeding problems and developmental disabilities. These observations are important, considering findings that discussion of topics beyond the immediate mealtime allow time for story-telling, descriptions, discussions and questioning and have the potential to develop insight, social confidence, problem solving, concept building and the forming of opinions (Aukrust & Snow, 1998; Beals, 1993; Ochs et al, 1992).

Summary. The following section summarises the main findings of the current study prior to a review of the clinical implications and suggestions for future research;

1. Parent stress. The current study found that caregivers of children with high levels of feeding problems experienced high levels of parent stress. Feeding problems had a greater impact on parent stress among caregivers of children with developmental disabilities. These findings are particularly important given the increased levels of stress resulting from the presence of developmental disabilities and the high prevalence of feeding problems within this cohort. Across both typically developing children and children with a developmental disability, mealtime aggression was found to have the strongest relationship with parent stress. This finding indicates that disruptive mealtime behaviours, which are often seen as secondary symptoms of feeding problems, may play an important role in parent stress.

2. Negative Mealtime Interactions. Children with developmental disabilities experienced increased negative mealtime interactions compared to typically developing children. Further, children with high levels of feeding problems experienced increased negative mealtime interactions compared to
children with low levels of feeding problems. These findings are of interest, given the importance of positive and reciprocal mealtime interactions. They suggest that children with developmental disabilities and/or feeding problems may be missing out on the learning opportunities that mealtimes provide. Mealtime socialisation, parent stress, and parent/child control of eating and feeding problems were all found to be significant predictors of negative mealtime interactions and may be important aspects to address when promoting positive mealtime interactions. Parent stress was the strongest predictor of negative mealtime interactions, highlighting the important role that caregiver characteristics may play in mealtime interactions. Mealtime aggression and food refusal were found to be significant predictors of negative mealtime interactions. These findings add to the limited research regarding the relationship between feeding problems and mealtime interactions and provide preliminary evidence that, disruptive mealtime behaviours may be playing a significant role in negative mealtime interactions.

3. **Mealtime Socialisation:** Neither the presence of developmental disabilities nor the presence of feeding problems demonstrated an association with mealtime socialisation in Study 1. However thematic analysis of video observations made in Study 2 suggested that the presence of developmental disabilities and/or feeding problems may give rise to mealtime interactions that are dominated by caregivers and focused on directive rather than social interactions. Mealtime interactions between caregivers and children with high levels of feeding problems tended to focus on feeding aspects of mealtimes rather than social aspects of mealtime. These findings provide tentative support for the suggestion that children with developmental disabilities and/or feeding problems may be missing out on the learning opportunities that mealtimes provide.
problems may be missing out on the benefits of mealtime socialisation, as mealtimes are focused on feeding rather than their social aspects.

**Clinical Implications**

The findings of this thesis provide valuable information for professionals working with caregivers and their children with developmental disabilities. Mealtime behaviour difficulties are an area of particular relevance. Their high prevalence across both typically developing children and children with developmental disabilities points to the need for more action to help reduce the impact of mealtime behavior difficulties on mealtime learning and development opportunities. In particular, mealtime aggression and food refusal appeared to be related to negative mealtime interactions and parent stress. It appears that the deleterious impact of mealtime behaviour difficulties may be poorly appreciated in the shadow of the more severe feeding problems which have previously been the focus of research. It would seem that there is a need for more research into the impact of mealtime behaviour difficulties in order to inform preventative and remedial education for caregivers of children who display mealtime behaviour difficulties.

The finding that feeding problems had a greater impact on parent stress among caregivers of children with developmental disabilities indicates that this cohort may be at particular risk. It would appear that the added burden of feeding problems along with other developmental issues compounds the negative impact and provides a direction for professionals working in early intervention roles with these families.
It is relevant that caregiver characteristics, and in particular parent stress and parenting strategies that are controlling in nature, were found to be important predictors of negative mealtime interactions. Considering that negative mealtime interactions may be exacerbating feeding problems (Van der Horst, 2012; Webber et al. 2010) and also potentially depriving children of the developmental opportunities offered during mealtimes, caregiver characteristics may be an important focus for interventions and education.

Even though levels of mealtime socialisation did not differ across groups in Study 1, the observational data from Study 2 provided preliminary evidence that mealtimes among children with developmental disabilities and feeding problems may focus on feeding rather than social aspects of mealtimes. It is possible that the measure of mealtime socialisation used in this study (Toddler Parent Mealtime Behaviour Questionnaire; Stommel et al., 2008) may not have reflected differences owing to its focus on the frequency of mealtime socialisation rather than its quality. Future studies need to determine a way to measure the quality rather than the quantity of mealtime socialisation.

It would appear that interventions focused on increasing mealtime learning opportunities would benefit from promoting positive and reciprocal mealtime interactions that encourage discussion regarding topics external to the immediate demands of the mealtime. The finding that mealtimes for children with high levels of feeding problems predominantly focused on feeding rather than social aspects of mealtimes highlights an important area for future research. Considering the numerous benefits of mealtime socialisation and the high prevalence of feeding problems among children with
developmental disabilities, it is vital that factors impacting on mealtime socialisation in this cohort are more thoroughly understood.

Professionals working with all children who display feeding challenges need to recognise that mealtimes are a shared family experience. Children should not be viewed in isolation when developing intervention plans, as information regarding the mealtime environment and family interactions are vital. Recommendations need to reflect the complexities of mealtime interactions, including consideration of caregiver characteristics. Interventions need to address feeding problems in the context of the family, in order to increase the likelihood of positive outcomes and to encourage families to embed these interventions into their daily routines.

**Limitations**

There are a number of limitations to this research that need to be noted. The first study used convenience sampling and an online format which had the potential for a self-selection bias towards caregivers who were concerned about their child’s feeding. This may have led to an overestimate of the impact of feeding problems on parent stress and mealtime interactions. To maximise variety within this sample, however, we implemented a range of recruitment strategies, such as promotion of the study at a university campus and via a range of online forums and early childhood service settings. Furthermore, data provided by internet based research has been shown to be comparable to, and to produces results consistent with, that of paper and pencil measures, and do not appear to be invalidated by repeat responders or false reporting (e.g., Gosling, Vaziere, Srivastava, & John, 2004).
The presence of a developmental disability was ascertained at recruitment whereby parents identified as having a child with a disability or developmental delay. The specific type of disability was subsequently provided via parent-report on an online questionnaire. It is thus a limitation of the study that it was not possible to confirm self-reported diagnoses or to determine the primary diagnosis, when more than one was provided. In this later case, the first mentioned diagnosis was recorded, with acknowledgement of the potential for inaccuracy.

The difference in the number of participants in each group and the difference in mean age, with those in the disability group and most particularly the disability and feeding problems group being older than those in the typically developing groups, may have influenced the findings. However, as typically developing children often experience fewer feeding problems as they develop (Benjasuwante, Chaithirayanon, & Eiamudomkan., 2013), it is possible that the impact of feeding problems reduces with age. Therefore differences observed in this older group may actually be more significant in comparison to the other groups.

Although the current study aimed to compare typically developing children with an array of children with developmental disabilities, a high percentage of children in the developmental disability group with high levels of feeding problems had a diagnosis of ASD. This is not surprising given the high levels of feeding problems identified within this population, however it is important to consider the potential impact of ASD on the findings, as parents of children with ASD have shown increased parent stress (Davies & Carter, 2008; Hayes & Watson, 2013) and negative mealtime interactions (Ausderau
irrespective of feeding problems. Therefore, future research may benefit from examining the impact of feeding problems on specific types of developmental disabilities.

The current thesis presented with a limitation in regards to the measure of negative mealtime interactions, as it was not used for its intended purpose. As the Positive Mealtime Environment sub-scale (AYCE; Davies, Ackerman, Davies, Vannatta, & Noll, 2007) was designed to be a measure of the tone of the mealtime environment. However a review of the items indicated that this measure reflected the tone of both mealtime interactions and the mealtime environment, therefore it was considered to be an appropriate measure.

Although the findings of this thesis highlight the significant impact that food refusal and mealtime aggression have on parent stress, it is possible that high scores on these measures may correlate with overall behavioural difficulties, rather the behavioural difficulties specific to mealtimes. Considering the major role that behavioural problems play in elevated levels of parent stress in parents of children with developmental disabilities (Baker et al., 2003; Neece et al., 2012; Tomanik et al., 2004), it may be useful for future research to control for the level of overall behavioural difficulties. Nonetheless the current study provides valuable information regarding the relationship between mealtime behavioural difficulties and parent stress and indicates that food refusal and mealtime aggression may play a role in the pattern of mealtime interactions.
It is possible that aspects of child temperament may have impacted on both parent stress and mealtime interactions in the current study, although this was beyond the scope of this research it may be an important factor to control for in future research.

The findings from Study 2 are restricted by the small sample size, which limits the generalisability of the results. The sample in Study 2 may have been biased, as families who volunteered to have their family meal recorded may not have been representative of the general population. Furthermore, it is possible that recordings of mealtimes were not reflective of typical family mealtimes as participants may have altered their behaviour when being recorded. It is also important to consider the impact of a child’s development (e.g., language, motor, cognitive) on mealtime interactions with family members, it is possible that variation in chronological age and developmental abilities across the sample may have contributed to observed differences in mealtime interactions. Although these findings need to be considered cautiously, they serve to promote further research in this area.

Finally, causation cannot be determined in cross-sectional research, for example we cannot conclude that feeding problems lead to parent stress or vice-versa. Interactions between caregivers and children are complex and likely bidirectional, with parent and child characteristics influencing each other and possibly compounding outcomes. Longitudinal studies may help elucidate the influence of parent and child characteristics on mealtime interactions.
Conclusion

Family mealtimes provide children with a range of learning opportunities, which are of particular importance to children with developmental disabilities who often require increased time and repetition to acquire new skills. Feeding problems, parent stress and the tone and focus of mealtime interactions have the potential to disrupt the developmental opportunities that mealtimes provide. Understanding the relationship between these factors and family mealtimes is therefore crucial to the development of successful interventions to enhance opportunities for all children to benefit from mealtime interactions. This research has also expanded our knowledge of how feeding problems and developmental disabilities are related to parent stress, negative mealtime interactions and mealtime socialisation. It has identified a number of factors that should be considered, both in future research and by professionals working in this field who wish to promote improved mealtime interactions and enhance the developmental opportunities that these recurring events provide. The importance of considering the role of disruptive mealtime behaviours was highlighted and caregiver characteristics that may be important to target within intervention programs were identified. The second study, albeit small, went beyond self-report and quantitative measures of mealtime socialisation to provide a more detailed picture of how developmental disabilities and feeding problems are related to mealtime interactions and socialisation. The valuable insights gained into the use of social and directive interactions at family mealtimes may inform future research toward the overall aim of improving opportunities and outcomes for all children.
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Appendix A.

Human Research Ethics Approval Study 1

Memorandum
To: A/Prof Jane McGillivray
   School of Psychology B
cc: Ms Camille Joy Totterdell

From: Deakin University Human Research Ethics Committee (DUHREC)

Date: 11 December, 2012

Subject: 2012-319: Mealtime Behaviours in Children with Disabilities: Family Interactions and Stress

Please quote this project number in all future communications.

The application for this project was considered at the DU-HREC meeting held on 10/12/2012.
Approval has been given for Ms Camille Joy Totterdell, under the supervision of A/Prof Jane McGillivray, School of Psychology, to undertake this project from 10/12/2012 to 10/12/2016.

The approval given by the Deakin University Human Research Ethics Committee is given only for the project and for the period as stated in the approval. It is your responsibility to contact the Human Research Ethics Unit immediately should any of the following occur:

- Serious or unexpected adverse effects on the participants
- Any proposed changes in the protocol, including extensions of time.
- Any events which might affect the continuing ethical acceptability of the project.
- The project is discontinued before the expected date of completion.
- Modifications are requested by other HRECs.

In addition you will be required to report on the progress of your project at least once every year and at the conclusion of the project. Failure to report as required will result in suspension of your approval to proceed with the project.

DUHREC may need to audit this project as part of the requirements for monitoring set out in the National Statement on Ethical Conduct in Human Research (2007).

Human Research Ethics Unit
research-ethics@deakin.edu.au

Telephone: 03 9251 7123
Appendix B.
Research Advertisement

Camille Tutterrell and Associate Professor Jane McGillivray from Deakin University are undertaking research into how mealtime behaviours and feeding problems influence mealtime interactions between children and their parents.

Our research requires the participation of primary caregivers of children aged between 1 and 6 years. We seek primary caregivers of children with disabilities and developmental delays, and primary caregivers of children who are typically developing.

Participation involves the completion of a short questionnaire. You can simply log on to our website and complete the questionnaire or you can contact our researchers and a questionnaire will be sent out to you with a reply paid envelope.

The returned questionnaire is completely anonymous and you will not be required to provide your name or any information that could potentially identify you. However, you will have the opportunity to provide your contact details if you wish to learn more about a follow-up study.

For more information and to participate please visit
www.deakin.edu.au/psychology/research/camilletutterrell/

Or if you are interested in finding out more details please contact Camille Tutterrell at ctutterell@deakin.edu.au or 0407 086 059
Appendix C.
Research Poster

Camille totterdell and associate professor jane mcgilvray from deakin university are undertaking research into how mealtime behaviours and feeding problems influence mealtime interactions between children and their parents.

our research requires the participation of primary caregivers of children aged between 1 and 6 years. we seek primary caregivers of children with disabilities and developmental delays, and primary caregivers of children who are typically developing.

participation involves the completion of a short questionnaire. you can simply log on to our website and complete the questionnaire or you can contact our researchers and a questionnaire will be sent out to you with a reply paid envelope.

the returned questionnaire is completely anonymous and you will not be required to provide your name or any information that could potentially identify you. however, you will have the opportunity to provide your contact details if you wish to learn more about a follow-up study.

for more information and to participate please visit www.deakin.edu.au/psychology/research/camilletotterdell/
or if you are interested in finding out more details please contact camille totterdell at cltodd@deakin.edu.au or 0407 086 059
Appendix D.
Plain Language Statement – Online Version

Mealtime Behaviours in Children with and without Disabilities: Family Interactions and Stress

Plain Language Statement

Date: 1st January 2013

Full Project Title: Mealtime Behaviours in Children with and without Disabilities: Family Interactions and Stress

Principal Researcher: A/Prof Jane McGillivray

Student Researcher: Camille Totterdell

Purpose and Background

Previous research has shown that children with disabilities and developmental delays have high levels of feeding problems and difficult mealtime behaviours. These mealtime difficulties are thought to impact on parent’s feelings, attitudes and approaches to mealtimes. Research has shown that mealtimes present important opportunities for children to develop social and language skills. Therefore, more work is required to determine how parents and children are influencing the positive interactions that commonly take place during family mealtimes.

The purpose of this project is to investigate how parent and child factors influence the interactions that take place during family mealtimes. We hope to investigate these factors among families of typically developing children and among families of children with a developmental disability or delay.

If you are the primary caregiver of a child aged between 1 and 6 years you are invited to participate in this research.

Funding

This research is funded by Deakin University.

Procedures

Participation in this project will involve completing a brief online questionnaire, which will take approximately 30 minutes to complete. You will be asked questions relating to both yourself and your child.

Questionnaire items will be related to a number of areas, including demographic information, attitudes and feelings towards feeding and mealtimes, feeding practices, parental stress and your child’s mealtime behaviour. For example, you will be asked
to indicate how often you sit down with your child at mealtimes and how often your child has mealtime tantrums. You will also be asked to indicate how strongly you agree with statements such as “I feel that my child is very moody and easily upset” and “My child’s sleeping and eating schedule was much harder to establish than I expected”.

Upon completion of this questionnaire you will be asked to indicate if you are interested in learning more about a follow up study that involves video observations of family mealtimes in your household. This follow-up study is subject to ethics approval and will only go ahead if ethical approval is granted. Only a small number of volunteer families will participate in this second study. If you are interested in this follow-up study, you will be asked to provide your contact details. These will be stored separately from your completed questionnaire, which will be coded so that it can be matched back to you, only if you consent to participate in the follow-up study.

Possible Benefits

It is not expected that this research will benefit you personally. However, it is hoped that this study will benefit the community through increased understanding of how parents and children influence the interactions that take place during family mealtimes.

Possible Risks

It is not expected that participation in this study will result in any feelings of psychological distress or discomfort. However, some individuals may react adversely to some of the questions. However, if completing these questionnaires raises any issues of concern please contact your General Practitioner, Lifeline on 13 11 14 or Parentline on 13 22 89.

Privacy, Confidentiality and Disclosure of Information

Identifying information such as your name or address is not required for this study. However, you will need to identify yourself if you choose to be contacted regarding further research. Storage of data will adhere to Deakin University regulations and will kept in a locked filing cabinet at Deakin University’s School of Psychology for six years following publication, after which the data will be disposed of in a confidential manner. Electronic information will be stored in password-protected files on a computer, which will only be accessible by the Principal and Student researchers.

In any publication, information will be provided in such a way that you cannot be identified. The data will be analysed and reported in group form.

Results of Project

No identifiable individual data will be documented. A summary of group findings will be available upon completion of the study. If you would like to be informed of the general research findings, they may contact Camille Totterdell via email at ctotterd@deakin.edu.au
Participation is Voluntary

Participation in any research project is voluntary. **If you do not wish to take part you are not obliged to.** Your decision as to whether you take part will not affect your relationship with Deakin University or any agencies involved in advertising this project and will not impact on any services you currently receive or your future eligibility to receive services from any agency.

Before you make your decision, a member of the research team will be available via email or phone to answer any questions you have about the research project. You are able to print or download the Plain Language Statement from this webpage if you desire.

Consent

By completing and submitting this questionnaire you are signifying your consent to participate in this project, this includes the provision of information regarding your child according the conditions of the Plain Language Statement.

If you decide to take part and later change your mind, you may withdraw from the study at any time before the questionnaire has been submitted by closing your study browser.

Monitoring

Researchers from Deakin University will monitor the project’s progress and will report to Deakin University Human Research Ethics Committee.

Complaints

If you have any complaints about any aspect of the project, the way it is being conducted or any questions about your rights as a research participant, then you may contact:

The Manager, Research Integrity,
Deakin University,
221 Burwood Highway,
Burwood, Victoria, 3125.
Telephone: 9251 7129
research-ethics@deakin.edu.au

Please quote project number **2012-319**

Further Information, Queries or Any Problems

If you require further information, wish to withdraw your participation, or if you have any problems concerning this project, you can contact the principal researcher.

The researcher responsible for this project is:

Camille Totterdell
School of Psychology, Deakin University
221 Burwood Highway, Burwood, 3125.
Email: ctotterd@deakin.edu.au
Mealtime Behaviours in Children with and without Disabilities: Family Interactions and Stress

Plain Language Statement

Date: 1st January 2013
Full Project Title: Mealtime Behaviours in Children with & without Disabilities: Family Interactions & Stress
Principal Researcher: A/Prof Jane McGillivray
Student Researcher: Camille Totterdell

Purpose and Background

Previous research has shown that children with disabilities and developmental delays have high levels of feeding problems and difficult mealtime behaviours. These mealtime difficulties are thought to impact on parent’s feelings, attitudes and approaches to mealtimes. Research has shown that mealtimes present important opportunities for children to develop social and language skills. Therefore, more work is required to determine how parents and children are influencing the positive interactions that commonly take place during family mealtimes.

The purpose of this project is to investigate how parent and child factors influence the interactions that take place during family mealtimes. We hope to investigate these factors among families of typically developing children and among families of children with a developmental disability or delay.

If you are the primary caregiver of a child aged between 1 and 6 years you are invited to participate in this research.

Funding

This research is funded by Deakin University.
Procedures

Participation in this project will involve completing a brief online questionnaire, which will take approximately 30 minutes to complete. You will be asked questions relating to both yourself and your child.

Questionnaire items will be related to a number of areas, including demographic information, attitudes and feeling towards feeding and mealtimes, feeding practices, parental stress and your child’s mealtime behaviour. For example, you will be asked to indicate how often you sit down with your child at mealtimes and how often your child has mealtime tantrums. You will also be asked to indicate how strongly you agree with statements such as “I feel that my child is very moody and easily upset” and “My child’s sleeping and eating schedule was much harder to establish than I expected”.

Upon completion of this questionnaire you will be asked to indicate if you are interested in learning more about a follow up study that involves video observations of family mealtimes in your household. This follow-up study is subject to ethics approval and will only go ahead if ethical approval is granted. Only a small number of volunteer families will participate in this second study. If you are interested in this follow-up study, you will be asked to provide your contact details. These will be stored separately from your completed questionnaire, which will be coded so that it can be matched back to you, only if you consent to participate in the follow-up study.

Possible Benefits

It is not expected that this research will benefit you personally. However, it is hoped that this study will benefit the community through increased our understanding of how parents and children influence the interactions that take place during family mealtimes.

Possible Risks

It is not expected that participation in this study will result in any feelings of psychological distress or discomfort. However, some individuals may react adversely to some of the questions. However, if completing these questionnaires raises any issues of concern please contact your General Practitioner, Lifeline on 13 11 14 or Parentline on 13 22 89.

Privacy, Confidentiality and Disclosure of Information

Identifying information such as your name or address is not required for this study. However, you will need to identify yourself if you choose to be contacted regarding further research. Storage of data will adhere to Deakin University regulations and will kept in a locked filing cabinet at Deakin University’s School of Psychology for six years following publication, after which the data will be disposed of in a confidential manner. Electronic information will be stored in password-protected files on a computer, which will only be accessible by the Principal and Student researchers.

In any publication, information will be provided in such a way that you cannot be identified. The data will be analysed and reported in group form.
Results of Project

No identifiable individual data will be documented. A summary of group findings will be available upon completion of the study. If you would like to be informed of the general research findings, you may contact Camille Totterdell via email at ctotterd@deakin.edu.au

Participation is Voluntary

Participation in any research project is voluntary. **If you do not wish to take part you are not obliged to.** Your decision as to whether you take part will not affect your relationship with Deakin University or any agencies involved in advertising this project and will not impact on any services you currently receive or your future eligibility to receive services from any agency.

Before you make your decision, a member of the research team will be available via email and phone to answer any questions you have about the research project.

Monitoring

Researchers from Deakin University will monitor the project’s progress and will report to Deakin University Human Research Ethics Committee.

Complaints

If you have any complaints about any aspect of the project, the way it is being conducted or any questions about your rights as a research participant, then you may contact: The Manager, Research Integrity, Deakin University, 221 Burwood Highway, Burwood Victoria, 3125, Telephone: 9251 7129, research-ethics@deakin.edu.au

Please quote project number 2012-319

Consent

By completing and returning this questionnaire you are signifying your consent to participate in this project, this includes the provision of information regarding your child according the conditions of the Plain Language Statement.

Further Information, Queries or Any Problems

If you require further information, wish to withdraw your participation or if you have any problems concerning this project, you can contact the student researcher.

The researcher responsible for this project is:

Camille Totterdell
School of Psychology, Deakin University
221 Burwood Highway, Burwood, 3125.
Email: ctotterd@deakin.edu.au
Phone: 0407 086 059
Mealtimes in Children with and without Disabilities: Family Interactions and Stress

INSTRUCTIONS TO PARTICIPANTS

Participation in this study is voluntary.

The information collected in this questionnaire will be kept strictly confidential.

Where indicated, please tick ☑ the appropriate box or boxes.

We would very much appreciate it if you could take care to complete every question fully.

If you have any queries or concerns regarding this questionnaire, please do not hesitate to contact Camille Totterdell at ctotterd@deakin.edu.au

Your participation in this study is very much appreciated. Thank you!

Please ensure that the person completing this questionnaire is the primary caregiver of this child. The primary caregiver is the person who takes care of a child most of the time.

1. Are you the primary caregiver of a child aged between 1 and 6 years?
   ☐ No If no, thank you for your interest, but this is a requirement for participation in this study
   ☐ Yes

2. Do you have a child who has been diagnosed with (or is suspected to have) a disability or a developmental delay?
   ☐ No If no, please skip Q2 a. b. and c. and go directly to the Instructions at the end of this page.
   ☐ Yes

If you have more than one child with a disability or developmental delay, please just answer about one child (and answer all of the remaining questions about that child).
There is a space provided below for you to list any other children you have who may also have a disability or developmental delay.

2a. If your child has been diagnosed with (or is suspected to have) a disability or developmental delay, please briefly outline (e.g. Cerebral Palsy, Down Syndrome, Autism Spectrum Disorder).

_____________________________________________________________________
_____________________________________________________________________

2b. If your child has been diagnosed or is suspected to have a disability or developmental delay please indicate the areas that they find challenging

☐ Gross Motor Skills (includes larger movements such as crawling, running and jumping)
☐ Fine Motor Skills (more precise movements using small muscles such as those in fingers)
☐ Personal, Emotional and Social Skills
☐ Language Skills
☐ Learning and Thinking Skills
☐ Other ______________________________________

2c. If you have any other children who have been diagnosed with (or is suspected to have) a disability or developmental delay, please briefly outline (e.g. Cerebral Palsy, Down Syndrome, Autism Spectrum Disorder).

_____________________________________________________________________
_____________________________________________________________________

Instructions

Parents/caregivers of children with a developmental disability or delay:
If you have a child with a developmental disability or delay aged between 1 and 6 years, please answer keeping that child in mind. (If you have more than one child with developmental disability or delay please answer in regards to your child closest to pre-school/kinder age).

Parents/caregivers of typically developing children:
If you do not have a child with a developmental disability or delay, but have a typically developing child aged between 1 and 6 years, please answer this questionnaire in regards to that child. (If you have more than one typically developing child please answer in regards to your child closest to pre-school/kinder age).

3. What is the date of birth of this child? DD/MM/YY
   ______/_____/_____

4. What is the gender of this child?
   ☐ Male
   ☐ Female

5. How many siblings does this child have? ________
6. Where does this child sit in the birth order of your children? _________
   (e.g. first born, second born.)

7. As the primary caregiver of this child, what is your relationship to the child?
   □ Biological Parent
   □ Step Parent
   □ Foster Parent
   □ Grandparent
   □ Other - please specify ____________

8. What is your gender?
   □ Male
   □ Female

9. Does this child have mealtime difficulties?
   □ No
   □ Yes - If yes, please outline below (e.g. behaviour, self-feeding, fussiness, swallowing, etc.)

__________________________________________________________________
__________________________________________________________________

10. Do any of your other children have mealtime difficulties?
    □ No
    □ Yes - If yes, please outline below (e.g. behaviour, self-feeding, fussiness, swallowing, etc.)

__________________________________________________________________
__________________________________________________________________

11. Who is usually present when this child eats their evening meal?
    (e.g. mother, father, siblings, grandparents)

__________________________________________________________________
__________________________________________________________________
Appendix G.
Mealtime Behaviour Questionnaire

<table>
<thead>
<tr>
<th>Behaviour</th>
<th>Never</th>
<th>Sometimes</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Hands in front of face</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2. Packing food in the mouth</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3. Leaving the table</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4. Pushing spoon/food away</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>5. Throwing food</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>6. Refusing to come to the table</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>7. Crying</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>8. Screaming</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>9. Hitting others or objects</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>10. Kicking others or objects</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>11. Spitting at a person</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>12. Letting food drop out of mouth</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>13. Spitting out food</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>14. Hiding food</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>15. Hitting self</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>16. Talking to keep from eating</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>17. Deal making (negotiation)</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>18. Reporting physical pain</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>19. Asking for comfort or assurance</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>20. Flailing arms/legs</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>21. Pushing away food from table</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>22. Only eating a few foods</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>23. Eating too slowly</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>24. Demanding alternative foods/foods</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>25. Playing with food</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>26. Choking or coughing on food or liquid</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>27. Playing with toys rather than eating</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>28. Verbally refusing to eat</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>29. Biting self</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>30. Biting others</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>31. Gagging</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>32. Vomiting</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>33. Not Sitting in Chair</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
Appendix H.
Subscales of Toddler Parent Mealtime Behaviour Questionnaire

Mealtime Socialisation Subscale

Instructions: In this section, we present statements about how you may or may not deal with your child during evening mealtimes. If you disagree or never do these things, choose ‘never’; if you agree, let us know how often you do these things.

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Often</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I sit down with my child at meals.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. I listen to my child at meals.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3. I talk to my child at meals.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4. My child and I eat together.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5. My child and I face each other when eating.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6. I encourage my child to talk during meals.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7. My child gets my full attention during meal times.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8. I encourage my child to talk right after he/she finishes eating.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Appendix I.
Subscale of About Your Child’s Eating Questionnaire

Negative Mealtime Environment Subscale

Instructions: A variety of situations take place in families around children’s eating. Please indicate how often each of the following occur between you and your child or in your family during evening mealtimes.

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>Sometimes</th>
<th>Once in a while</th>
<th>Often</th>
<th>Nearly every time</th>
</tr>
</thead>
<tbody>
<tr>
<td>32. 1. Meal times are among the most pleasant in the day.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. The family looks forward to meals together.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3. Mealtime is a pleasant, family time.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4. I get pleasure from watching my child eating well and enjoying his/her food.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5. We have nice conversations during meals.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
Appendix J
Subscales of Feeding Strategies Questionnaire

**Parent Control and Child Control Eating Subscale**

Instructions: Please indicate your level of agreement with the following statement regarding feeding strategies during evening mealtimes.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree nor Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>My child knows when it is time to stop eating by paying attention to her/his body.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>My child knows when s/he is full.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>My child knows instinctively how much to eat.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>When my child says s/he is full, I don’t ask her/him to eat any more.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>My child knows when s/he is hungry.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>I never push my child to eat more than s/he says s/he wants.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>7</td>
<td>My child is driven to eat by her/his hunger.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>8</td>
<td>My child can choose the amount of each food that s/he wants to eat at a meal.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>9</td>
<td>I am in control of my child’s eating.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>10</td>
<td>I feel that I am in control of my child’s eating.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>11</td>
<td>It is the parent’s responsibility to make sure that their child eats enough food at each meal.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>12</td>
<td>When my child hasn’t eaten enough, I make sure s/he eats more.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>13</td>
<td>I don’t allow my child to eat more than I think s/he should.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>14</td>
<td>My child decides whether s/he will eat the foods offered at each meal.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
Appendix K.
Parent Stress Index – Short Form

Parent Stress Index

Instructions: Please check the answer that comes closest to how you feel.

<table>
<thead>
<tr>
<th></th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Not sure</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>I often have feelings that I cannot handle things very well</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2.</td>
<td>I find myself giving up more of my life to meet my children’s needs than I ever expected</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>3.</td>
<td>I feel trapped by my responsibilities as a parent</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4.</td>
<td>Since having this child, I have been unable to do new and different things</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5.</td>
<td>Since having this child I feel that I am almost never able to do the things that I like to do</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>6.</td>
<td>I am unhappy with the last purchase of clothing I made for myself</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>7.</td>
<td>There are quite a few things that bother me about life</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>8.</td>
<td>Having a child has caused more problems than I expected in my relationship with my spouse (or male/female friend)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>9.</td>
<td>I feel alone and without friends</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>10.</td>
<td>When I go to a party I usually expect not to enjoy myself</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>11.</td>
<td>I am not as interested in people as I used to be</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>12.</td>
<td>I don’t enjoy things as I used to</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>13.</td>
<td>My child rarely does things for me that make me feel good</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
14. Most times I feel that my child likes me and wants to be close to me

15. My child smiles at me much less than I expected

16. When I do things for my child I get the feeling that my effort are not appreciated very much

17. When playing my child doesn’t often giggle or laugh

18. My child doesn’t seem to learn as quickly as most children

19. My child doesn’t seem to smile as much as most children

20. My child is not able to do as much as I expected

21. It takes a long time and is very hard for my child to get used to new things

22. I expected to have closer and warmer feelings for my child than I do and this bothers me

23. Sometimes my child does things that bother me just to be mean

24. My child seems to cry or fuss more often than most children

25. My child generally wakes up in a bad mood

26. I feel that my child is very moody and easily upset

27. My child does a few things which bother me a great deal

28. My child reacts very strongly when something happens that my child doesn’t like

29. My child gets upset easily over the smallest thing
<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>30. My child’s sleeping and eating schedule was much harder to establish than I expected</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31. There are some things that my child does that bothers me a lot</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>32. My child turned out to be more of a problem than I expected</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>33. My child makes more demands on me than most children</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>34. I feel that I am</td>
<td>A very good parent</td>
<td>A better than average parent</td>
<td>An average parent</td>
<td>A person who has some trouble being a parent</td>
<td>Not very good at being a parent</td>
</tr>
<tr>
<td>35. I have found that getting my child to do something or stop doing something is:</td>
<td>Much harder than I expected</td>
<td>Somewhat harder than I expected</td>
<td>About as hard as I expected</td>
<td>Somewhat easier than I expected</td>
<td>Much easier than I expected</td>
</tr>
<tr>
<td>36. Think carefully and count the number of things which your child does that bothers you. For example: dawdles, refuses to listen, overactive, cries, interrupts, fights, whines, etc. Please circle the number which includes the number of things that you counted.</td>
<td>1-3</td>
<td>4-5</td>
<td>6-7</td>
<td>8-9</td>
<td>10+</td>
</tr>
</tbody>
</table>
Appendix L.

Indication of Interest in Follow up Research

---

**Mealtime Behaviours in Children with and without Disabilities: Family Interactions and Stress**

If you are interested in learning more about being involved in follow-up research please provide your name and contact details below. This follow-up project is subject to ethics approval and will only go ahead if ethic’s approval is obtained. To protect your confidentiality, this page (containing your personal details) will be coded and kept separately from your questionnaire and will only be identified and accessed with your permission.

Name:________________________________________________

Contact Phone Number: __________________________________

Contact Email: _________________________________________
Appendix M.

Outline of Statistical Assumptions

**Outliers.** The data was screened for both univariate and multivariate outliers. In order to test for univariate outliers, standardized scores were computed, z-scores larger than 3.29 were considered to be outliers (Tabachnick & Fidell, 2013). In order to test for multivariate outliers, cases identified through Mahalanobis distance with a $p < .001$, were considered multivariate outliers (Tabachnick & Fidell, 2013). Outliers were replaced using the highest score plus one unit. If participants presented with more than one univariate outlier they were considered to be significantly different from the target population and were removed from the analysis.

**Normality.** The assumption of normality was assessed by comparing skewness and kurtosis values with the standard error and by viewing histograms with an overlay of the normal curve. Skewness and kurtosis are thought to have little effect on regression analyses when participant number are large ($n = 100-200$). Therefore non-normal distributions were not considered to be of concern within the multiple regression analyses as participant number were large ($N > 200$) (Tabachnick & Fidell, 2001). However, within the Analysis of Variance tests the sample was split into four separate groups based on disability prevalence and level of mealtime behaviour difficulty, resulting in smaller participant groups ($n < 100$). All non-normal distributions were transformed following recommendations of Tabachnick and Fidell (2013), however transformations did not improve the variables therefore original data was used.

**Missing Data.** Total and subscale scores across all measures were computed by calculating the mean across all items included in the scale. Mean scores for were only calculated for cases that had no more than 1 item was missing from the subscale. Where a case had 1 item missing, the sum of the items was divided by the number of items remaining.

**Multicollinearity.** To determine if there was a problem with multicollinearity among the independent variables, the variance inflation factor
(VIF) and tolerance statistics were checked. Variance inflation factors above 10 (Bowerman and O’Connell, 1990; Myers, 1990) and tolerance values below 0.2 (Menard, 1995) were considered to be indicators of multicollinearity. Information obtained from both the computation of tolerance and the VIF statistic indicated no multicollinearity problems in the current data.

**Independence of errors.** The Durbin-Watson statistic was used to test the assumption of independent errors. A Durbin-Watson statistic below 1.00 or above 3.00, was considered to be an indicator that the assumption of independent errors was violated (Field, 2009). Information obtained from both the computation of the Durbin-Watson statistic indicated no independence of errors problems in the current data.

**Homogeneity of Variance.** A significant Levene’s tests, was considered to be an indication that the assumption of homogeneity of variance had been violated (Tabachnick & Fidell, 2013). A number of the Two-way ANOVA’s produced significant Levene’s tests. Transformations were performed on each of the dependant variables, however Levene’s test of homogeneity of variance remained significant. As are no alternative methods available that enables analysis of interaction effects in a Two-Way Mixed ANOVA, the results were interpreted despite violations to the assumption of homogeneity.
Appendix N.

Human Research Ethics Approval Study 2

Human Research Ethics
Deakin Research Integrity
70 Elgar Road Burwood Victoria
Postal: 221 Burwood Highway
Burwood Victoria 3125 Australia
Telephone 03 9251 7123
Facsimile 03 9244 6581
research-ethics@deakin.edu.au

Memorandum

To: A/Prof Jane McGillivray
School of Psychology

From: Deakin University Human Research Ethics Committee (DUHREC)

Date: 16 April, 2013

Subject: 2013-056
Mealtime Behaviours in Children with and without Disabilities: An Observational Study

Please quote this project number in all future communications

The application for this project was considered at the DU-HREC meeting held on 08/04/2013.

Approval has been given for Miss Camille Joy Totterdell, under the supervision of A/Prof Jane McGillivray, School of Psychology, to undertake this project from 16/04/2013 to 16/04/2017.

The approval given by the Deakin University Human Research Ethics Committee is given only for the project and for the period as stated in the approval. It is your responsibility to contact the Human Research Ethics Unit immediately should any of the following occur:

• Serious or unexpected adverse effects on the participants
• Any proposed changes in the protocol, including extensions of time.
• Any events which might affect the continuing ethical acceptability of the project.
• The project is discontinued before the expected date of completion.
• Modifications are requested by other HRECs.

In addition you will be required to report on the progress of your project at least once every year and at the conclusion of the project. Failure to report as required will result in suspension of your approval to proceed with the project.
DUHREC may need to audit this project as part of the requirements for monitoring set out in the National Statement on Ethical Conduct in Human Research (2007).

Human Research Ethics Unit
research-ethics@deakin.edu.au
Telephone: 03 9251 7123
When phoning participants who have expressed interest in being involved in a follow up study. The following protocol will be followed.

* if at ANY STAGE participants indicate that they are not interested in learning more about the study or do not wish to participate in the study, The Associate Researcher will thank the participant for their time and assure them that their questionnaire data will remain anonymous.

1. Introduction
   - My name is Camille Totterdell. I am a Researcher from Deakin University.
   - Earlier this year you completed a questionnaire about Mealtime Behaviour and expressed interest in participating in a follow up study.

2. Check that they are interested in learning more about the follow up study.
   - I am ringing to tell you a bit more about our follow up study. Are you are interested in learning more?

3. Explain that participation is completely voluntary.
   - Participation in this follow up project is completely voluntary and you are under no obligation participate.

4. Explain what participation involves.
   - Participation in this project will involve video recordings being taken of typical family mealtimes in your house. Researchers will not be present during these recordings; they will visit your home at a convenient time to set up the recording equipment and teach you how to use it.
   - The recording equipment will be left with your family for up to 4 days. You will be asked to record two typical family mealtimes. You will be asked to turn the recording device on approximately 10 minutes before your child or children sit down to eat their evening meal and turn recording equipment off when the mealtime has concluded. After each family mealtime you will be asked to complete a brief self-report questionnaire which will ask you to rate how typical the mealtime was. The Researchers will arrange a convenient time to return to collect the recording equipment within 4 days.
   - If you do decide to participate in this second study, we will need to match your responses from the initial questionnaire to the video data. We will do this using a coding system which matches your questionnaire data to the contact details you provided. But we will only undertake this matching after you have provided your consent to participate.
   - If you are interested in participating we will require consent from all members of your household who are typically present during family mealtimes.
5. Check to see if families are still interested in participating in the study.
   - If you are still interested in participation or in learning more about this study I can post you out a Plain Language information statement and Consent Forms.
   - Once you have received the PLS and Consent forms you are encouraged to contact me to ask any questions you might have.

6. Explain process if the family are still interested in participating after receiving consent forms and PLS.
   - If you have received PLS’ and consent forms and all members of your household consent to participate. We will ask you to return the signed consent forms to our research team in a reply paid envelope.
   - You will be required to provide consent for all your children aged under 18 years, who will be present during the mealtime recordings. Young children cannot consent to participate, but when we visit your house we will ask your children if they are happy to be recorded. And we will ask you to turn off the recording equipment if your children show any reluctance to participate.
   - Once we receive consent forms. I will contact you to organise a convenient time for myself and another member of the research team to visit your family home to set up recording equipment.

7. Check if PLS for children aged 10 – 18 is required?
   - If you have children aged between 10 and 18 who will be present during recorded mealtimes, I will need to send a separate PLS and assent form out for them. Will this be necessary?
   - You will still be required to provide consent for these children but we want to make sure older children understand what the study involves and are happy to participate.

8. Repeat voluntary nature of research and explain that they can withdraw at ANY stage!
   - Participation in this follow up project is completely voluntary and you are under no obligation participate.
   - You will be free to withdraw at any stage. We will teach you how to turn off the recording equipment and you will be free to stop recording if you feel uncomfortable at any stage.

9. Answer ANY questions and determine if participant would like PLS and Consent forms mailed to them.
Plain Language Statement

Date: 15th April 2013

Full Project Title: Mealtime Behaviours in Children with and without Disabilities: An Observational Study

Principal Researcher: Camille Totterdell

Associate Researcher: A/Prof Jane McGillivray

Purpose and Background
Children with disabilities and developmental delays often have feeding problems and disruptive mealtime behaviours. These difficulties may impact on parent’s feelings, attitudes and approaches to mealtimes. Mealtimes present important opportunities for children to develop behavioural, social and language skills. It is therefore important to determine how parents and children influence the learning opportunities and interactions that commonly take place during family mealtimes.

The purpose of this project is to analyse video recordings of evening mealtimes to establish how mealtime interactions differ between families, including those with typically developing children and those with children who have developmental delays.

Funding
This research is funded totally by Deakin University.

Procedures
If you are being invited to participate in this research you have already completed the questionnaire titled “Mealtime Behaviours in Children with and without Disabilities: Family Interactions and Stress” and have agreed to be contacted regarding a follow up study.

Participation in this study will involve video recordings of two typical evening mealtimes in your family home. Researchers will organise a time to attend your home and set up video recording equipment. Researchers will provide you with written instruction and will teach you how to use the recording equipment. You will be asked to record for the duration of two family mealtimes. Researchers will not be present during video recordings and will return within four days to collect the recording equipment. Following each mealtime recording you will be asked to complete a brief questionnaire regarding how typical the mealtime was for your family.
Only members of the research team will view or have access to video recordings and questionnaire data. Once video recordings have been analysed they will be deleted from the recording device and stored in a password-protected computer file at Deakin University. Results from this study will always be reported in a way that cannot identify you or any members of your family.

In order to complete this research we require access to your responses to the previously completed questionnaire “Mealtimes Behaviour Among Children with and without Disability: Family Interactions and Stress”. A coding system has been used that can enable matching, but only if you provide your permission for this to occur. By signing the consent form below you are providing consent for us to match your Questionnaire responses to the data collected in this new project.

Possible Benefits
It is not expected that this research will benefit you personally. However, it is hoped that this study will benefit the community through increased our understanding of how parents and children influence the interactions that take place during family mealtimes.

Possible Risks
It is not expected that participation in this study will result in any feelings of psychological distress or discomfort. However, if participating in this study raises any issues of concern please contact your General Practitioner, Lifeline on 13 11 14 or Parentline on 13 22 89. You are free to withdraw from the study at anytime. If you feel uncomfortable or distressed during the video recording of mealtimes, you are free to stop recording at ANY stage. If any participant indicates reluctance to participate or discomfort during video recordings you will required to STOP recording.

Privacy, Confidentiality and Disclosure of Information
Storage of data will adhere to Deakin University’s regulations and will be kept in secure storage for six years following publication, after which it will be disposed of in a confidential manner. Electronic information will be stored in a password-protected computer file and hard copies of questionnaires will be stored in a locked filing cabinet at Deakin University. Only the Principal and Associate Researchers will have access to stored data. Video recordings will ONLY be viewed by members of research team for the purpose of this study. In any publication, information will be provided in a way that cannot identify you or any members of your family. Only general group findings will be reported.

Results of Project
No identifiable individual data will be reported. A summary of group findings will be available upon completion of the study during 2014. If you would like to be informed of the general research findings, you may contact Camille Totterdell via email at ctotterd@deakin.edu.au

Participation is Voluntary
Participation in any research project is voluntary. **If you do not wish to take part you are not obliged to.** You and your family are free to withdraw at any time and any information obtained from your family up until that point will not be used and will be destroyed.
Monitoring
Researchers from Deakin University will monitor the project’s progress and will report to Deakin University Human Research Ethics Committee.

Consent
By signing the consent forms that follow you are indicating consent for yourself (Adult Consent Form) and your child/children (Third Party Consent Form) to participate in this project according to the terms of the Plain Language Statement. If you have a child/children aged between 10 and 18 years, a separate Plain Language Statement and Consent form will be provided for them to sign. However you will still be required to provide consent for them to participate in this study by including their names on a signed Third Party Consent Form.

If there are additional Adults who typically participate in your family mealtimes, who will be present during video recording session, they will be required to read this Plain Language Statement and sign an Adult Consent Form.

If any member of your family decides to take part and later changes their mind, they may withdraw from the study at ANY stage by contacting the Research Team or by returning the Revocation of Consent Form below.

Complaints
If you have any complaints about any aspect of the project, the way it is being conducted or any questions about your rights as a research participant, then you may contact:
The Manager, Research Integrity, Deakin University, 221 Burwood Highway, Burwood Victoria, 3125, Telephone: 9251 7129, research-ethics@deakin.edu.au
Please quote project number: 2013-056

Further Information, Queries or Any Problems
If you require further information, wish to withdraw your participation or if you have any concerns regarding this project, you can contact the student researcher.
The researcher responsible for this project is:
Camille Totterdell
School of Psychology, Deakin University
221 Burwood Highway, Burwood, 3125.
Email: ctotterd@deakin.edu.au
Phone: 0407 086 059
Appendix Q.

Adult Consent Form

To Adult Participants,

Adult Consent Form

Date: 15th April 2013
Full Project Title: Mealtime Behaviours in Children with and without Disabilities: An Observation Study
Reference Number: 2013-056

1. I have read and understand the attached Plain Language Statement. I freely agree to participate in this project. I have been given a copy of the Plain Language Statement to keep.

3. The researchers have agreed not to reveal my identity or any of my personal details, including where information about this project is published, or presented in any public form.

4. Aggregated (summarised) results will be used for research purposes and may be reported in scientific and academic journals.

5. I am free to withdraw myself from this study at any time and that any information obtained from me up until that point will not be used and will be destroyed.

Adult Participant’s Name (printed)

Signature ……………………… Date …………………

Adult Participant’s Name (printed)

Signature ……………………… Date …………………

Adult Participant’s Name (printed)

Signature ……………………… Date …………………
Appendix R.
Revocation of Consent Form

<table>
<thead>
<tr>
<th>Date:</th>
<th>15th April 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Full Project Title:</strong></td>
<td>Mealtime Behaviours in Children with and without Disabilities: An Observation Study</td>
</tr>
<tr>
<td><strong>Reference Number:</strong></td>
<td>2013-056</td>
</tr>
</tbody>
</table>

I hereby wish to **WITHDRAW** my consent to participate in the above research project and understand that such withdrawal **WILL NOT** jeopardise my relationship with Deakin University.

Participant’s Name (printed) ……………………………………………………………

Signature ……………………………………………………………….
Date ……………………

Please post or email this form to:

Camille Totterdell  
School of Psychology, Deakin University  
221 Burwood Highway, Burwood, 3125.  
Email: ctotterd@deakin.edu.au
Appendix S.

Third Party Consent Form

TO: Parent(s)/Guardian(s)

<table>
<thead>
<tr>
<th>Third Party Consent Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date: 15th April 2013</td>
</tr>
<tr>
<td>Full Project Title: Mealtime Behaviours in Children with and without Disabilities: An Observation Study</td>
</tr>
<tr>
<td>Reference Number: 2013-056</td>
</tr>
</tbody>
</table>

I, _______________________________ hereby consent for my child/children (Please print name of Parent or Guardian)

………………………………………………… hereby consent for my child/children (Please print name of Parent or Guardian)

……………………………………………DOB……/……/…..

……………………………………………DOB……/……/…..

……………………………………………DOB……/……/…..

to participate in this project according to the conditions in the Plain Language Statement.

I acknowledge that:
1. I have read and understand the attached Plain Language Statement. I freely agree to allow my child/children to participate in the research. I have received a copy of the Plain Language Statement to keep.
2. The researchers have agreed not to reveal my child/children’s identity and personal details, including where information about this project is published, or presented in any public form.
3. Aggregated (summarised) results will be used for research purposes and may be reported in scientific and academic journals.
4. I am free to withdraw my child/children from this study at any time and that any information obtained from my child/children up until that point will not be used and will be destroyed.

1) Parent/Guardian’s Signature …………………………Date ………………………

2) Parent/Guardian’s Signature …………………………Date ………………………

NOTE: Only the parents or legal guardians of children may provide consent for a child to participate. The parent(s)/guardian(s) of all children must sign the consent form in order for the children to participate.
Appendix T.

Video Recording Instructions Given to Families

- Please record a total of two family mealtimes.
- Please try to record a mealtime that is typical for your family (e.g. Include family members who are typically present and do not introduce new food).
- Set up the recording equipment in the room where your family meal usually takes place.
- Set up the camera about 3m from the table on a stable surface. It is important that all verbal and non-verbal communication can be picked up.
- Please begin recording when food is first served to your child and stop when all family members have finished their meal and left the table.
- At the end of the mealtime please complete the attached questionnaire which asks to briefly outline how the recorded mealtime compares to a typical mealtime for your family.
- You are free to withdraw from the study at anytime. If you feel uncomfortable or distressed during the video recording of mealtimes, you are free to stop recording at ANY stage. If any participant indicates reluctance to participate or discomfort during video recordings please STOP recording immediately.

Please feel free to ring me if you have any questions or concerns.

Regards Camille Totterdell
M: 0407 086 059
Appendix U.

Mealtime Typicality Questionnaire

Please estimate how typically the *recorded mealtime* was, in comparison to an average family mealtimes in your household.

<table>
<thead>
<tr>
<th>Mealtime Typicality Rating</th>
<th>Not At All Typical</th>
<th>Somewhat Typical</th>
<th>Very Typical</th>
</tr>
</thead>
<tbody>
<tr>
<td>How typical was the recorded mealtime in regards to your child/children’s behaviour?</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>How typical was the recorded mealtime in regards to your families interactions?</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>How typical was the recorded mealtime Overall?</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

Please briefly describe any aspects of the recorded mealtime that you feel were “Not at All Typical” or “Somewhat Typical” of an average family mealtime in your household.

_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________