
Review of Parent Training Interventions for Parents with Intellectual Disability

Catherine Wade*, Gwynnyth Llewellyn† and Jan Matthews‡

*University of Sydney and Parenting Research Centre, Carlton, Victoria, Australia; †University of Sydney, Sydney, Australia;

‡Parenting Research Centre, Carlton, Victoria, Australia

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Background This paper reviews recent research to provide an updated perspective on the effectiveness of parent training interventions for parents with intellectual disability. The degree to which these studies meet previous recommendations for future research is explored, particularly with regard to the influence of context on intervention outcomes.

Materials and Methods Seven studies are reviewed, which have been published in the peer-reviewed literature since 1994.

Results Evidence from this review supports the use of individually administered home-based behavioural intervention for parents with intellectual disability. However, the effect of parent training interventions on child outcomes and the generalization of parenting skills is rarely investigated. Contextual factors that may be

associated with intervention success (or failure) are also neglected.

Conclusions There is reasonable evidence of the effectiveness of parent training for parents with intellectual disability. However, investigators have yet to determine the influence of immediate or more distal contextual factors on intervention outcomes. This presents a significant gap in the literature in contrast to other areas of parenting intervention research where the influence of family and the broader community context has been shown to influence the effectiveness of parent training interventions.

Keywords: education, intellectual disability, learning difficulty, parenting, parent training, program

Introduction

Parents with intellectual disability often need training in basic child care, health and safety, child behaviour management, parent–child interactions, social skills, problem solving or decision making, managing transitions, and stress management (Tymchuk & Feldman 1991; Tymchuk 1992). However, the evaluation of parent training efforts for parents with intellectual disability in the literature is somewhat recent. In his 1994 review, Maurice Feldman noted that until 1983 ‘... there was no published research on the effectiveness of child-care training programs for these parents’ (p. 300). The period between 1983 and 1994 saw a steady increase in the frequency of reports of interventions for parents with intellectual disability (Figure 1). Given this rising interest, Feldman (1994) saw the need to ‘critically review the parent training literature to determine if, in fact, parents with

cognitive limitations and their children do benefit from parent education efforts’ (p. 301).

Following analysis of 20 studies of parenting interventions, Feldman (1994) concluded that parents with intellectual disability can acquire parenting skills given appropriate training. For instance, parents had been taught to provide positive and stimulating interactions with their children, improve decision making and problem solving, improve grocery shopping and menu planning skills and provide nutritious meals for their children, provide basic child care to meet their child’s needs, improve cleanliness and home safety, and identify the most appropriate course of action for child behaviour management or home safety. Feldman’s (1994) analysis identified evidence-based strategies for working with parents with intellectual disability. These are: that interventions are most effective when they occur in the home; are skill-focused; and, use

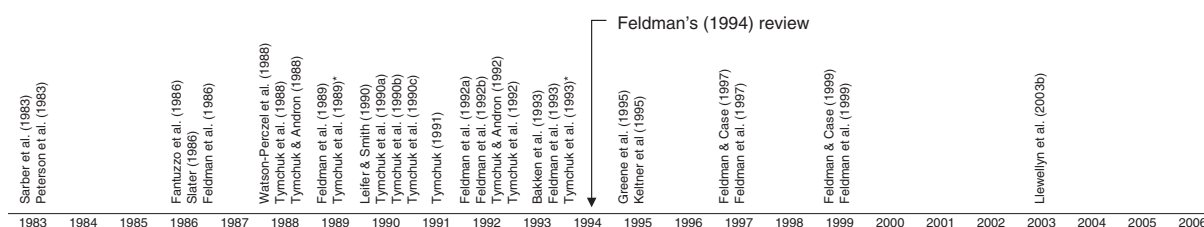


Figure 1 Historical timeline of published studies of parent training interventions for parents with intellectual disability. *Includes two replication studies published prior to 1994 but not included in Feldman's (1994) review.

behavioural teaching strategies such as modelling, practice, feedback, praise, tangible reinforcement, and task analysis as a way of breaking complex child care tasks down into steps to be taught individually. While Feldman (1994) noted that interventions for parents with intellectual disability led to improvements in parenting both during training and at follow-up, skill generalization and child outcome data were limited and there was variability in intervention success.

Given the variability in intervention effectiveness, Feldman (1994) recommended that future research efforts should examine the influence of child, family and environmental variables on responsiveness to intervention, and the effects of programmes on aspects of family life such as parent stress, marital satisfaction, parental self-esteem, child behaviour and development, the home environment and others' (e.g. health workers) perceptions of the family. The influence of context in the success of interventions for parents with intellectual disability had rarely been considered at this time. This was despite widespread speculation that contextual factors such as socioeconomic status may play a greater role than parental intelligence in parenting success (Mickelson 1947; Budd & Greenspan 1984; Feldman *et al.* 1986; Andron & Tymchuk 1987; Kelley *et al.* 1997).

The need to consider contextual factors as an influence on intervention outcomes is supported by emerging evidence that, among other socially disadvantaged families, environmental factors are predictors of successful parenting interventions (see Webster-Stratton & Hooven 1998; Belsky *et al.* 2006; Guttentag *et al.* 2006; Lundahl *et al.* 2006). There is significant theoretical and empirical support for the proposition that context matters to parenting effectiveness, child functioning, and intervention outcomes. One conceptual framework for considering influences on parents, children, and interventions, includes the following four domains: child factors (e.g. behaviour problems, age), parent factors (e.g. stress, depression), familial factors (e.g. social support, partner support), and environmental factors (e.g.

low income, neighbourhood disadvantage). Although an understanding of the extent of influence, and the pathways via which these various contextual factors influence parent training outcomes remains subject to further research it is clear from the evidence to date that a combination of negative contextual characteristics across these four domains is an impediment to effective intervention (Webster-Stratton & Hooven 1998; Guttentag *et al.* 2006; Lundahl *et al.* 2006).

Since Feldman's (1994) review parenting by people with intellectual disability has continued to interest academics, legal practitioners, and social service workers. In 1996, an international research group on parenting with intellectual disability was formed as a Special Interest Research Group of the International Association for the Scientific Study of Intellectual Disability. Government bodies have also begun to recognize the need for investment in this area, as demonstrated by Australian Government funding for the Healthy Start strategy in 2005, aimed at supporting the children of parents with learning difficulties (see <http://www.healthy-start.net.au>). Over the past 15 years there has also been a surge of research interest in the lives of parents with intellectual disability (see Booth & Booth 1993a,b; Dowdney & Skuse 1993; Sheerin, 1998; Feldman *et al.* 2002), resulting in a greater understanding of the context surrounding these families. Generally, evidence suggests that parents with intellectual disability are a heterogeneous group, demonstrating variability in parenting skills and living circumstances. Many of these families, however, experience living conditions which have been associated with poor parenting, negative child outcomes, and with intervention failure in the general population (Booth & Booth 1993a; McGaw 1998; Feldman 1998a; Llewellyn *et al.* 2002).

The primary aim of this paper is to identify to what degree contextual factors have been considered in research on parent training for parents with intellectual disability, beginning with a review of the second generation of research on parenting interventions for these

parents. In doing so, the paper: (i) evaluates the effectiveness of parent training interventions for parents with intellectual disability; (ii) highlights how parents with intellectual disability can be best supported to meet the needs of their children; (iii) identifies methodological characteristics and limitations of the existing research; and (iv) identifies gaps in the current understanding of successful parenting intervention for parents with intellectual disability.

Materials and Methods

To identify recently published studies the present review employs inclusion criteria similar to that of Feldman (1994). Feldman (1994) focused on peer-reviewed publications of parent training efforts to teach parents skills or knowledge in child care, parent-child interaction, decision making, and behaviour management. Like Feldman (1994), the present review excludes studies that do not provide adequate outcome and/or descriptive information about the intervention (e.g. Ray *et al.* 1994; Booth & Booth 1996, 1999; Tymchuk & Sowards 2000; Heinz & Grant 2003; Tymchuk 2004; Young & Hawkins 2006), studies for at-risk families in general, which do not isolate data for parents with intellectual disability (e.g. Olds *et al.* 2002; Belsky *et al.* 2006) and interventions that describe child-focused interventions but do not involve parent training (e.g. Ramey *et al.* 2000; Booth & Booth 2003). Furthermore, studies are not included if they did not teach parenting skills (e.g. McGaw *et al.* 2002) or if they have not been published in peer-reviewed journals or books (e.g. Crimi 1995).

An extensive search of relevant databases (Web of Science, PsychLit, Proquest, OVID, Cochrane Database of Systematic Reviews, Current Contents, Dissertations and Theses: Full Text, PsychInfo, PubMed, ERIC) was made to identify articles, reports, and book chapters on parent training interventions for parents with intellectual disability. Reference lists in salient articles and conference proceedings were searched, with authors of dissertations and conference abstracts contacted by email. This resulted in 29 published studies involving parent training interventions for parents with intellectual disability. Nine of these were not in Feldman's (1994) review, with seven published after 1994. The two studies published before 1994 were replications of previous studies, involving four participants each (Tymchuk *et al.* 1989, 1993). Therefore, only the seven recent studies are included in the present review.

Results are presented in three sections. In the first, 'Effects of training', the subheadings used by Feldman

(1994) are used to describe findings on the effect of interventions on parenting skills, maintenance, generalization, child, and other outcomes. In the second, 'Features of the interventions', successful teaching strategies, teaching settings, and ideal treatment intensity are described. The third and final section, titled 'Contextual factors related to intervention success' includes an exploration of the role of context in interventions.

Results

Effects of training

Effects on parenting skills

Table 1 summarizes the results of studies on parent training with 123 parents (114 mothers, 9 fathers) with intellectual disability published since 1994, presented in chronological order.

All seven studies incorporated meaningful, valid, and reliable outcome measures. The studies reporting individual outcome data included inter-observer reliability ratings, and these were found to be moderately to very high (Greene *et al.* 1995; Feldman & Case 1997, 1999; Feldman *et al.* 1997, 1999). These studies conducted observations to assess actual skill performance, with all but one study (Llewellyn *et al.* 2003b) using direct observation of actual parent behaviour as a dependent measure. Llewellyn *et al.* (2003b) used an observation checklist during training to record changes that the parent had made in their home to improve the health and safety of their children.

There were significant post-intervention differences between intervention and no-intervention comparison groups in parent knowledge and/or behaviour in the two experimental studies that employed between-group designs with randomization (Keltner *et al.* 1995; Llewellyn *et al.* 2003b). The other five studies employed quasi-experimental designs with small samples. Findings from these studies demonstrate that parents could be taught to increase performance of targeted skills or tasks. However, unstable baselines (Greene *et al.* 1995; Feldman & Case 1999), and baselines containing only one data point (Feldman & Case 1997) limit the interpretation of findings from these quasi-experimental studies. Feldman *et al.* (1999) presented stable or decreasing baselines across most participants in their demonstration of the effectiveness of self-instructional materials on the parenting skills of 10 mothers, using a multiple baseline design.

Table 1 Summary of studies reviewed

Study	n	Parent IQ (method)	Parent age (years)	Child age (months)	Skills trained	Training procedures (location)	Intensity of intervention	Experimental design (adequate baseline?)	Generalization	Maintenance	Child and other measures	Results	Drop out
Greene et al. (1995)	Two families (2 mothers, 1 father)	64-75 (previous reports)	Mother A = 22; family B not specified	Family A = 1; family B = 23-96	Family A, child care and parent-child interactions (diapering, feeding, bathing, illness, stimulation, play); family B child care (nutrition, cleanliness)	Task analysis, written information, pictures, verbal instruction, modelling, role play, praise, corrective feedback; behavioural contracts (home)	Approximately 100 (family A) and 75 (family B) sessions held once or twice weekly; sessions were 60 min for family A; not reported for family B; no indication of time per session devoted to skills training	Multiple baseline across skills (no)	Family A not measured; family B, no generalization to untargeted parenting tasks	Family A, maintenance period varied across skills (eg. 40 sessions for diapering; 4 sessions; if skill dropped below 80% correct, booster training was provided (required for diapering, taking temperature, and recognizing illness); not available for family B.	Child weight and child behaviour (family A); no child outcomes for family B; time allowed in access visits and custody status (both families)	Family A: improvement in targeted parent behaviour (feeding, interactions, handling baby); home hazards reduced; child weight increased from <5th percentile to 50th percentile; improvement in child behaviour; most skills maintained up to 40 sessions; maintenance of interaction skills not reported; access visit time increased over intervention; family regained custody of child. Family B: no initial improvement; increase in task completion with behavioural contract; task completion decreased after contract removed; whole family demonstrating task completion access time increased. Following disruptive events (birth of child, moving house), task completion variable, associated with decrease in access. Following another disruptive event (verbal abuse of staff by father) access time decreased although task completion was high. Family did not regain custody of child. Program failure attributed to presence of complications (history of negative parenting experiences, disruptive behaviour of partner, lack of social supports, parent depression). Mean inter-observer agreement was 84% across all phases and behaviours.	0 (but family B did not complete intervention)

Table 1 (Continued)

Study	n	Parent IQ (method)	Parent age (years)	Child age (months)	Skills trained	Training procedures (location)	Intensity of intervention	Experimental design (adequate baseline?)			Child and other measures	Results	Drop out
								Generalization	Maintenance	Other			
Keltner et al. (1995)	40 (all mothers)	Range = 36-84; mean = 59 (treatment group); 63 (control group) (Slosson Intelligence Test-Revised ¹ ; social system definition of intellectual disability ²)	Mean = 25.4 (treatment); 22.6 (control)	Range = 12-36; mean = 24.5 (treatment); 27.8 (control)	Play skills and child care (health, safety, and meal preparation)	Mainly small group meetings with individualized contact and reinforcement in parents' homes; used modelling, discussion, and repeated practice in different settings; teaching strategies were 'specific, frequent, and practical' ³ (home, group, and field trips)	Weekly group sessions, weekly home visits, and periodic field trips over 1 year; insufficient information to determine length of sessions.	Between-groups design with random allocation to groups (N/A)	Not measured	Not measured	Child behaviour observations ⁴ (clarity of child cues, responsiveness to parents, and contingent responsiveness between parent and child)	After 1 year: intervention group demonstrated significant improvement after 1 year in parent-child interaction ($P < 0.05$) ⁴ ; no significant improvement in interaction skills of comparison group (monthly phone contact only); intervention group children received more positive interactions than comparison children; child interaction scores in both groups remained below normative sample ⁴ ; intervention group children showed small increases in clarity of cues, responsiveness to parent, and contingent responsiveness; no such increase for comparison children; no inter-observer reliability collected.	Not discussed
Feldman et al. (1997)	Two single mothers	Parent A = 70; Parent B not available (previous reports)	31 and 23.5	7 and 11	Child care (nutrition, feeding)	Worker-led instruction using task analysis, pictorial aids, verbal instruction, discussion, modelling, feedback, self-recording, and tangible reinforcement (home)	Hour-long sessions (30-min skills training) once or twice weekly over 26 (mother A) and 20 weeks (mother B)	Multiple baseline across subjects (yes, but sometimes few data points in baseline)	Not measured	Skills monitored over follow-up periods of 28 (family A) and 58 months (family B)	Child weight	Both parents' feeding and nutrition skills improved and maintained over follow-up. Intervention associated with increase in child weight from <3rd percentile to 25th and 15th percentiles; maintained in follow-up. Subsequent to intervention the children's treating doctors removed diagnoses of failure to thrive. Mean inter-observer reliability agreement was 92%, collected on 9% of the observations.	0

Table 1 (Continued)

Study	n	Parent IQ (method)	Parent age (years)	Child age (months)	Skills trained	Training procedures (location)	Intensity of intervention	Experimental design (adequate baseline?)	Generalization	Maintenance	Child and other measures	Results	Drop out
Feldman & Case (1997)	Thirteen (11 mothers, 2 fathers)	IQ not available (previous reports)	Mean = 25.31, range = 20-40	Mean = 4.64, range = 1-44	Child care (cleanliness, safety, managing illness, feeding)	Self-instruction using pictorial manuals based on task analyses; weekly visits from trainer for observation; if after 4 weeks, no progress with manual alone an associated audiotape added; if no progress after 1 more week parent asked to read manual aloud before observation; if prompts unsuccessful, full practitioner-led training introduced (home)	NA	Repeated measures within subjects design (no, only one session)	Monitored one skill not targeted by self-instructional materials; following intervention with the two training skills parents given the relevant manual and/or audio tape (whatever worked best) for the third skill as replication	Skills monitored for 1-15 months (mean 6 months); follow-up not a no-intervention period; eight parents received materials for an additional child-care skill during follow-up	No child measures; consumer satisfaction ratings	Self-instructional materials increased all targeted skills, 82% of the skills reached in mean of 3.5 sessions. For 22 out of 26 skills (across 13 parents) skills increased to levels seen in non-intellectually disabled parents. One parent who failed to reach criterion using self-instruction was subsequently trained using face-to-face practitioner-led teaching. Three parents who did not reach criterion with manual alone did reach criterion after audiotape was introduced. 81% of the skills targeted for intervention using self-instructional materials were maintained over 1-15 months (excludes results from two families who received full practitioner-led training owing to lack of progress using self-instructional materials). Behavioural generalization did not occur. Mean inter-observer reliability agreement was 91.5%, collected on 14.4% of the observations. High consumer satisfaction.	0

Table 1 (Continued)

Study	n	Parent IQ (method)	Parent age (years)	Child age (months)	Skills trained	Training procedures (location)	Intensity of intervention	Experimental design (adequate baseline?)			Maintenance	Child and other measures	Results	Drop out
								Generalization	Not measured	Multiple baseline across subjects (yes)				
Feldman et al. (1999)	Ten (all mothers)	Range = 71-76, mean = 73.8 (WAIS-R)	Range = 19-39, mean = 28	Mean = 10.2, range 3-22.5	Child care (cleanliness, safety)	Self-instruction using pictorial manuals based on task analyses (as per Feldman & Case 1997); weekly visits from trainer for observation; no prompts during training; full practitioner-led training introduced if no progress with manual after 4 weeks (home)	NA	Multiple baseline across subjects (yes)	Not measured	Follow-up period ranged from 0 to 174 weeks (mean = 47.4 weeks); one mother unavailable for follow-up; one mother received full training after no progress using self-instructional materials; no prompts or instruction given during follow-up	Anecdotal reports of two of the children's health from family physicians and nurses; consumer satisfaction ratings	Pictorial manuals used to teach child-care skills to the level of non-intellectually disabled parents in 9 of the 10 participants, across 12 out of 13 skills. Across 10 mothers, correct use of steps increased from 5% at baseline to 78.7% with manuals and 90.2% in follow-up (significant at baseline to training and baseline to follow-up, $P < 0.001$). One mother received full practitioner-led training after failing to reach criterion with manuals alone (not clear whether mean per cent correct follow-up figure includes parent who received full practitioner-led training). After training in nappy rash treatment the children's nappy rash disappeared. Mean inter-observer reliability agreement was 90.8%, collected on 14% of the observations. High consumer satisfaction.	0, although 1 not available at follow-up	

Table 1 (Continued)

Study	n	Parent IQ (method)	Parent age (years)	Child age (months)	Skills trained	Training procedures (location)	Intensity of intervention	Experimental design (adequate baseline?)	Generalization	Maintenance	Child and other measures	Results	Drop out
Feldman & Case (1999)	Ten (9 mothers, 1 father)	IQ not available (previous reports)	Mean = 30.33, range = 23-34	Mean = 16.5, range = 4-51	Child care (cleanliness, safety, managing illness)	Self-instruction using pictorial manuals based on task analyses (as per Feldman & Case 1997) and audiotapes; weekly visits from trainer for observation; if no progress after 4 weeks a verbal instruction to use materials was given; if after one more week still no progress, parent asked to read manual aloud before observation; if prompts unsuccessful, full practitioner-led training introduced (home)	NA	Multiple baseline across subjects (not for all participants)	Not measured	Maintenance of skills observed up to 6.5 months; no prompts or instructions given during follow-up	No child consumer satisfaction ratings	Self-instructional materials led to improvements for all parents, and reached criterion for 9 out of 10 parents and 11 of 12 skills. Mean per cent correct scores increased from 39% in baseline to 72% in training to 86% in follow-up. One parent's performance decreased to below 80% correct in follow-up, therefore full practitioner-led training implemented (mean follow-up score includes the parent who received full practitioner-led training). Mean inter-observer reliability agreement was 95%, collected over 12% of the sessions. High consumer satisfaction.	0

Table 1 (Continued)

Study	n	Parent IQ (method)	Parent age (years)	Child age (months)	Skills trained	Training procedures (location)	Intensity of intervention	Experimental design (adequate baseline?)	Generalization	Maintenance	Child and other measures	Results	Drop out
Llewellyn <i>et al.</i> (2003b)	Forty-five (40 mothers, 5 fathers)	Range = 40-97 (Kaufman Brief Intelligence Test; used social system definition of intellectual disability) ²	Mean = 32; range 22-45	Mean age of youngest child = 28; range = 0-54	Health and safety (recognizing dangers, implementing precautions, managing illness, and emergencies); based on adaptation of programme developed by Tymchuk <i>et al.</i> (1992)	Home Learning Programme (HLP); curriculum-based didactic instruction; trainer worked through series of scripted modules with parents in one-on-one teaching setting, reading aloud the script from the manuals which included pictures, questions and activities for the parent to work through (home)	Weekly sessions were 60-90 min in duration; 10-12 weeks to teach 10 modules	Between-groups design with random allocation to groups (N/A)	Not measured	Three-month follow-up based on 17 participants	No child measures; checklist of parent's knowledge of health and safety, dangers, and precautions in home	HLP improved parents' ability to recognize and manage home dangers, and identify and implement precautions. HLP resulted in significant improvements in parent's understanding of health and illness safety, ($P < 0.025$ compared with visits and current services and $P < 0.001$ compared with lesson booklets), knowledge of skills needed to manage emergencies ($P < 0.001$ compared with visits and current services and $P < 0.025$ compared with lesson booklets), knowledge about visiting the doctor ($P < 0.01$ compared with visits and current services), and medicine safety ($P < 0.025$ compared with visits and current services). Other conditions also led to increases in parent learning. Many gains maintained 3 months post-intervention. For home precautions implemented and health comprehension, a decrease in performance was noted from post- to 3-month follow-up. No inter-observer reliability.	Eighteen dropouts from 63 participants recruited (all before intervention began)

^aArmstrong & Jensen (1984).^bMercer (1973).^cKellner *et al.* (1995, p. 47).^dAs measured by the Nursing Child Assessment Teaching Scale (NCATS; Barnard & Kelly 1990).

Maintenance

With the exception of Keltner *et al.* (1995), all studies included a follow-up period, with variation in the length of time for which maintenance was recorded. Most studies reported short- to mid-term retention of skills, that is, between 1 month and 1 year (e.g. Feldman & Case 1997, 1999; Llewellyn *et al.* 2003b). Two reports showed maintenance of skills with the majority of parents over the longer term, that is, more than 2 years after intervention (e.g. Feldman *et al.* 1997, 1999). The measurement of skill maintenance over an extended period is encouraging, given Feldman's (1994) caution about the trend towards brief follow-up periods.

When measured, maintenance of skills was generally achieved. To illustrate, across the three studies of child care skill acquisition via self-instruction pictorial manuals (Feldman & Case 1997, 1999; Feldman *et al.* 1999), 96% of the skills that met criterion during intervention were maintained correct above 80% during follow-up (Feldman 2004). In two studies, the authors report some parents failing to maintain the skills learned (Feldman & Case 1997; Llewellyn *et al.* 2003b).

Generalization

Three types of generalization were considered by Feldman (1994): generalization from saying to doing, behavioural generalization across different child-care tasks, and setting generalization. Generalization from saying to doing and across-setting generalization were not measured in any of the seven studies under review. Generalization across parent behaviours was reported in two studies. Feldman & Case (1997) found that generalization across child-care skills did not occur from the self-instructional materials targeting two other skill domains. Greene *et al.* (1995) reported there was no generalization from intervention parenting tasks to non-intervention parenting tasks. All of the studies employed strategies that have previously been described as being effective in promoting generalization (Feldman 1994). For example, all provided training in the home and some taught skills in a range of settings (e.g. Keltner *et al.* 1995; Feldman *et al.* 1997). There was limited attention, however, in evaluating the different types of generalization.

Child outcomes

Positive changes were found in the four studies that assessed child behaviour or health. For example, Keltner *et al.* (1995) and Greene *et al.* (1995) found improvements

in child behaviour associated with parent training interventions. Feldman *et al.* (1999) found that specific child health concerns were eliminated. Two studies reported improvement in children's weight following parent training (Greene *et al.* 1995; Feldman *et al.* 1997).

Objective measurement of child outcomes occurred in various ways across the four studies. Feldman *et al.* (1999) provided an indication of the validity of their intervention by collecting anecdotal reports of child health from family physicians and nurses not connected with the programme. Feldman *et al.* (1997) and Greene *et al.* (1995) reported weight percentiles in an attempt to control for potential child maturation effects. Keltner *et al.* (1995) used a standardized measure of child behaviour, the Nursing Child Assessment Teaching Scale (Barnard & Kelly 1990), and controlled for maturational effects by including a randomly allocated no-treatment comparison group. Greene *et al.* (1995) reported an increase in child positive behaviour and a decrease in negative behaviour with a positive change in the mother's behaviour, however there was no comparison group to control for potential maturational effects.

Other outcomes

Only Feldman and colleagues (Feldman & Case 1997, 1999; Feldman *et al.* 1999) included consumer satisfaction ratings regarding parents' views on, or satisfaction with the self-instructional intervention. Feldman *et al.* (1997) collected anecdotal information from other professionals about the impact of the intervention, along with a rating from others involved with the parents about their views of the intervention. Feldman's (1994) review similarly found low rates of evaluation of social validity.

Features of the interventions

Teaching strategies

Each of the studies employed teaching strategies known to be effective with parents with intellectual disability, with an emphasis on behavioural teaching strategies such as task analysis (Greene *et al.* 1995; Keltner *et al.* 1995; Feldman *et al.* 1997, 1999; Feldman & Case 1997, 1999); modelling (Greene *et al.* 1995; Keltner *et al.* 1995; Feldman *et al.* 1997); and, repeated practice (Greene *et al.* 1995; Keltner *et al.* 1995). Two studies specifically mentioned the use of praise or tangible reinforcement, as

well as verbal corrective feedback (Greene *et al.* 1995; Feldman *et al.* 1997). Most used either verbal instruction (Greene *et al.* 1995; Keltner *et al.* 1995; Feldman *et al.* 1997; Llewellyn *et al.* 2003b) or, in the case of Feldman & Case (1997, 1999), a verbal prompt to use the self-instructional materials.

Two studies compared modes of intervention. Feldman & Case (1997) taught parents one skill using only self-instructional pictorial manuals and one skill with manuals plus audiotapes. Three parents who did not reach criterion with the manual alone reached criterion after the audiotape was introduced, suggesting that some parents with intellectual disability may need more than one mode of intervention to acquire skills.

Llewellyn *et al.* (2003b) employed didactic instruction based on strategies previously found to be effective (Tymchuk 1991; Tymchuk *et al.* 1990c, 1992). They compared curriculum-based instruction (the Home Learning Programme; HLP) with three other conditions (existing services, lesson booklets posted to the parents, and informal visits). The HLP resulted in significant improvements in parents' knowledge of health, symptoms of illness, and skills needed to manage life-threatening emergencies (compared with all other conditions) and in knowledge about visiting the doctor and knowledge and skills about using medicine safely (compared with visits and current services only). Nevertheless, Llewellyn *et al.* (2003b) found that the other conditions showed some success in increasing parent learning. For example, the provision of lesson booklets led to improvements in danger recognition and identification and implementation of safety precautions, although average improvements were not as large as those observed following implementation of the full HLP.

The success of the sole use of lesson booklets in the study by Llewellyn *et al.* (2003b) supports Feldman's (1986, 1994) hypothesis that self-instructional manuals may be a useful and cost-effective way of teaching new skills to parents with intellectual disability. Based on studies included in his review, Feldman (1994) noted that where pictorial aids had been used successfully they had been part of a training package combined with modelling, role play, and reinforcement. The sole use of pictorial materials at that time had not been investigated. Feldman (2000, 2004) summarized the combined results of the three studies that investigated the use of self-instructional pictorial manuals to teach child-care skills (Feldman & Case 1997, 1999; Feldman *et al.* 1999). Across all studies ($n = 33$) only two parents failed to reach criterion (80% of steps correct over at least two

sessions) on at least one skill via self-instruction (Feldman 2004). There was a significant correlation between professionals' ratings of the parents' initial reading of the self-instructional manual and the mean per cent correct score during training (Feldman 2004). This suggests that parents with low literacy may experience greater learning difficulties that inhibit the effectiveness of self-instructional manuals. This conclusion is supported by evidence that parents who did not reach criterion with the manual alone reached criterion after audiotape was introduced.

Teaching setting

In all studies training was implemented in the home, with all but one reporting on programmes that were solely home-based. Keltner *et al.* (1995) taught skills mainly in the group setting, with individualized contact and reinforcement occurring in the parent's home on a weekly basis. It is not possible to identify from this study the relative effects of group versus home-based training as training occurred in each setting simultaneously.

Treatment intensity

All studies assumed intervention should be regular and frequent (e.g. weekly or twice weekly). In two cases it was not possible to identify the length of sessions or how much time per session was devoted to actual teaching of parenting skills as opposed to dealing with other issues that required attention (Greene *et al.* 1995; Keltner *et al.* 1995). Regarding treatment duration, interventions were sometimes more than 1 year in length (e.g. Greene *et al.* 1995; Keltner *et al.* 1995). However, positive results were also found for relatively brief interventions of around 12 weeks (Llewellyn *et al.* 2003b).

Frequency of material use was not reported in the studies using self-instructional materials (Feldman & Case 1997, 1999; Feldman *et al.* 1999), although information on the duration of intervention was provided. Feldman & Case (1997) found that 82% of skills targeted were acquired within an average of 3.5 sessions (see Feldman 2004); Feldman *et al.* (1999) found that the average number of sessions needed to reach criterion was 3.8 (range 2–8 sessions), and Feldman & Case (1999) found that the mean number of training sessions required to reach criterion was 5.5 (range 3–10) with most parents needing three ($n = 4$) or four sessions ($n = 3$) to reach criterion.

Contextual factors related to intervention success

Three of the seven studies commented on the potential impact of parent, family, or environmental factors on intervention outcomes. Greene *et al.* (1995) speculated on potential reasons for the comparative failure of the intervention in one of their two case studies, suggesting that a longer history of problem parenting, a greater number of children, an unhelpful partner, fewer social supports, greater social isolation, maternal depression, and parent relationship difficulties may have been related to programme failure. Feldman and his colleagues' studies on self-instructional materials demonstrated a significant correlation between initial acceptance of the materials by the parents (rated by therapists at the initial training session) and parents' skill performance at follow-up ($P = 0.05$; see Feldman 2004). In their between-groups design, Keltner *et al.* (1995) considered variables beyond the intervention itself that may be related to treatment effects. These authors found that two mothers who did not show significant changes in interactions following intervention were receiving treatment for depression.

Another contextual factor that may confound intervention effectiveness is simultaneously occurring interventions. Parents with intellectual disability are often involved with a number of services, with workers targeting more than one area for training or support at any one time. For example, during Feldman's Parent Education Programme (e.g. Feldman *et al.* 1997) some participating families also received counselling, stress management, and social skills training (Feldman 1998b). Greene *et al.* (1995) noted that the children in their evaluation were involved in foster care, however the potential effect of this on measured child outcomes (such as child weight) was not possible to determine. Similarly, the effect of the case coordination aspect of the intervention described by Keltner *et al.* (1995) was not differentiated from other aspects of the intervention such as group instruction, home-based skills training, or field trips. Across the seven studies it is not clear whether other interventions were occurring simultaneously, and if so what the timing of these and levels of intensity were.

Discussion

The studies examined in this review support Feldman's (1994) conclusions based on the 'first generation' of studies of parent training for parents with intellectual disability. That is, home-based behavioural parent train-

ing leads to successful learning of parenting skills among parents with intellectual disability. Furthermore, the only randomized group comparison studies support the use of curriculum-based didactic instruction (Llewellyn *et al.* 2003b) and a combination of group and individualized intervention using behavioural instruction (Keltner *et al.* 1995). In addition, teaching via self-instructional materials appears to be an effective and relatively rapid way of teaching parents with intellectual disability new skills in child care (Feldman & Case 1997, 1999; Feldman *et al.* 1999; Llewellyn *et al.* 2003b).

There are questions about the outcomes of interventions for parents with intellectual disability that remain unanswered. First, as Feldman asked in 1994, what are the effects, if any, of parenting interventions on family functioning, parent stress and self-esteem, marital satisfaction, home environment, child maltreatment, or 'raison d'être for parent training' – child outcomes (Feldman 1994, p. 322)? Second, to what extent can parents with intellectual disability generalize knowledge and skills to other behaviours and other settings? Third, which parents can maintain newly learned skills (and why) and to what extent does maintenance occur? Fourth, what contextual influences such as child, parent, family, and environmental factors have an effect on the success (or otherwise) of parenting interventions for parents with intellectual disability? This last question is fundamental to developing targeted, effective, and efficacious parent training interventions. In essence, future research needs to address the critical question of which parent training interventions are effective, for whom, to what extent, and under what conditions. As this review demonstrates, little attention has yet been given to child, parent, family, or environmental factors that may be associated with intervention outcomes.

Studies included in Feldman's earlier review similarly did not take contextual factors into account, with one exception (i.e. Feldman *et al.* 1993). Feldman *et al.* (1993) examined the relationship between family context and intervention; however, there was no association between the presence of risk factors and parent responsiveness to an intervention aimed at improving parent-child interactions. A number of authors of studies from the earlier review suggest possible links between intervention outcome and contextual variables; however, these were not tested empirically. For example, Tymchuk and colleagues (Tymchuk *et al.* 1988, 1990a; b; Tymchuk & Andron 1992) proposed that mothers who showed slower progress or poor maintenance of skills tended to have additional difficulties such as depression, alcoholism, lack of support from a partner, partner with mental

health issues, a physical health problem, or a chaotic home situation.

The studies in the present review suggest some potential factors that are worthy of further investigation to determine whether they are related to intervention success. These include parent factors such as parenting history, partner characteristics, and maternal depression; family factors such as family size, social support, and the parent relationship; and, environmental factors such as social isolation (Greene *et al.* 1995; Keltner *et al.* 1995; Feldman 2004). In the absence of empirical evidence, proposed relationships between contextual factors and intervention outcomes remain speculative. Conducting robust empirical studies to test this speculation is imperative given that parents with intellectual disability are not a homogeneous group, and a one-size-fits-all approach to intervention may not suffice.

This lack of attention to contextual influences on intervention outcome is out of step with developments in the quite substantial body of research on parent training for the general population. The general parenting literature already contains an informed and still developing understanding of the role that contextual factors play in parent training interventions (e.g. Webster-Stratton & Hooven 1998; Belsky *et al.* 2006; Guttentag *et al.* 2006; Lundahl *et al.* 2006). Without this understanding in the field of parenting with intellectual disability, it is difficult to challenge popular assumptions about these parents, e.g. that any intervention failure is because of low parent intelligence. Given that parenting is a complex task influenced by many contextual factors and that parents with intellectual disability vary considerably, as do other parents, it is highly likely that determinants of parent training intervention success rely, at least in part, on complex and interacting influences from the child, his or her parent/s, their family, and their social and community environment.

As a whole, research on the effectiveness of parent training for parents with intellectual disability is characterized by limited generalization data, short-to-moderate follow-up periods, small sample sizes, a lack of information about fathers with intellectual disability, and limited data on treatment intensity and concurrent interventions. Nevertheless, the studies reviewed here represent an admirable attempt to meet the demands of programme evaluation within an applied setting. Research on parents with intellectual disability presents particular challenges, including the tendency for families to have multiple workers and many interventions occurring at the one time; an imperative to intervene before adequate baselines can be recorded; ethical consider-

ations preventing the withholding of treatment for a control or comparison sample; and, the need to gain informed consent from participants who may be reluctant to engage in research studies. Considering the difficulties associated with applied research in general, and research with people with intellectual disability in particular, the studies reported in Feldman's (1994) and in the current review are to be commended.

In general, the literature about parents with intellectual disability is characterized by small sample sizes. Studies reviewed here and by Feldman (1994) predominantly involved 10 or fewer participants in multiple-baseline designs, with some exceptions, such as Llewellyn *et al.* (2003b) involving 45 parents. There is value in continued reporting of small sample and case-study interventions as this facilitates in-depth analysis of individual families which allows detailed exploration of contextual factors associated with intervention effectiveness. However, for these studies to be robust, the establishment of adequate baseline data, detailed specification of components of the intervention, and identification of simultaneously occurring interventions will, at the very least, need to be included. In addition, well-controlled evaluations of parent training interventions with large representative samples of mothers and fathers with intellectual disability are required to strengthen the evidence base. These studies are needed to add weight to the existing evidence and to extend understanding by identifying the influences and potential pathways via which child, parent, family, and environmental factors singly or in combination moderate the effect of an intervention. Furthermore, the findings from this review suggest that replication studies on the utility and cost-effectiveness of pictorial and audio self-instructional techniques in a comparison design would be worthwhile to build upon evidence for cost-effective interventions.

Conclusion

Since 1994, only seven reports of parent training for parents with intellectual disability that meet Feldman's (1994) inclusion criteria have been reported in the peer-reviewed literature (see Figure 1). In comparison, in the period from 1983 to 1994 there were 22 such studies. The frequency of published reports of parent training interventions for parents with intellectual disability therefore appears to be declining. One possible explanation is the growing interest in aspects of the parents' lives other than their response to parenting interventions. Recent literature has focused on identifying characteristics of parents with intellectual disability,

including descriptions of their parenting behaviour, and identification of the risk of child maltreatment (e.g. Feldman 1998b; Tymchuk 2001; Feldman *et al.* 2002; Llewellyn & McConnell 2002; Llewellyn *et al.* 2003a; Booth *et al.* 2005). Typically these studies are descriptive rather than experimental. Merging knowledge of parent, child, family, and environmental characteristics of parents with intellectual disability into the design of studies aimed at evaluating parent training intervention would be a productive way forward.

The first generation of research on parent training for parents with intellectual disability provided insight into intervention strategies that are effective in teaching parents with intellectual disability new skills. The second generation of research confirmed the utility of these intervention strategies and extended their application to self-instructional strategies. A third generation of research is needed to focus on child, parent, family, and environmental influences on intervention outcomes. Knowledge from such research will enable design of interventions to target the individual needs of parents and their children. This would also permit the possibility of identifying parents for whom particular parenting interventions are indicated or indeed contraindicated. The potential impact of such evidence is twofold: to reduce the risk of drop-out from interventions that may not be ideally suited to parents' needs; and importantly, to ensure the highest rate possible of intervention success for all parents.

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Correspondence

Any correspondence should be directed to Catherine Wade, Parenting Research Centre, 24 Drummond Street, Carlton, Victoria 3053, Australia (e-mail: cwade@parentingrc.org.au).

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