

Influences of Family-Systems Intervention Practices on Parent–Child Interactions and Child Development

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Abstract

The extent to which the influences of family-systems intervention practices could be traced to variations in parent–child interactions and child development was investigated by meta-analytic structural equation modeling (MASEM). MASEM is a procedure for producing a weighted pooled correlation matrix and fitting a structural equation model to the patterns of relationships in the data. The main practices constituting the focus of analysis were capacity-building help-giving practices, social supports and resources, family needs (concerns and priorities), and family strengths. Eight studies were included in the meta-analysis. The participants were 910 infants, toddlers, and preschoolers with and without developmental delays or disabilities and their parents or other primary caregivers involved in different kinds of help-giving programs. Results showed that capacity-building help-giving and family-systems intervention practices had direct effects on both parent self-efficacy beliefs and well-being and indirect effects on parent–child interactions and child development mediated by self-efficacy beliefs and parent well-being. Implications for practice and further research are discussed.

Keywords

family-systems intervention, parent–child interaction, child development, meta-analysis, structural equation modeling

The manner in which family-systems intervention practices were related to both parent–child interactions and child development was the focus of the meta-analysis described in this paper. The family-systems model that was investigated has been developed and updated during the past 25 years (Dunst, Trivette, & Deal, 1988; 1994; Trivette, Deal, & Dunst, 1986). Each version of the model includes key elements from *social systems* (Bronfenbrenner, 1979), *empowerment* (Rappaport, 1981), *family strengths* (Stinnett & DeFrain, 1985), *social support* (Cohen & Syme, 1985), and *help-giving* (Brickman et al., 1982) theories. The most recent version of the model has been modified and changed based on findings from research syntheses of each of the different practices making up the key elements of the model (Dunst & Trivette, 2009a).

Figure 1 shows the four components of the family-systems model. The components include capacity-building help-giving practices, family needs (concerns and priorities), family strengths, and social supports and resources. The model is implemented by practitioners by using capacity-building help-giving practices to have family members identify their needs, the supports and resources to meet those needs, the use of family members' existing capabilities (strengths), and the development of new abilities to

obtain resources and supports to meet their needs. The hypothesized influences of family-systems intervention practices on parent–child interactions and child behavior are based on Bronfenbrenner's (1979, 1992, 1999) contention that unless parents are provided the necessary supports and resources to have the time and energy to carry out their parenting responsibilities, they cannot interact with their children in development-enhancing ways that promote child development. More specifically, Bronfenbrenner (1979) noted that

whether parents can perform effectively in their child-rearing roles within the family depends on the role demands, stresses, and supports emanating from other settings. . . . Parents' evaluation of their own capacity to function, as well as their view of their child, are related to such external factors as flexibility

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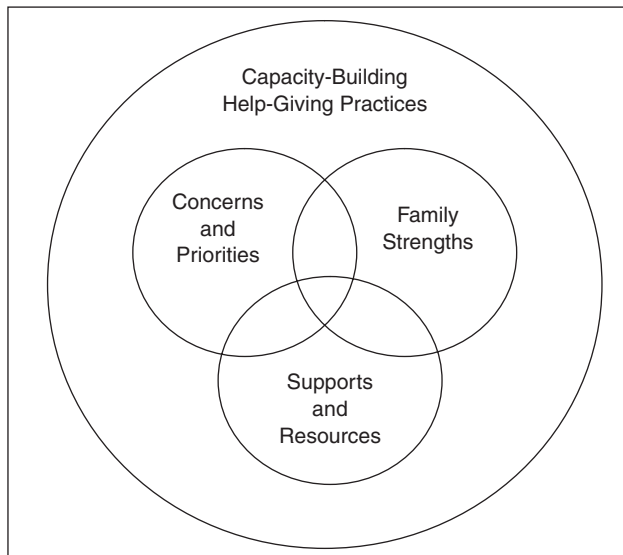


Figure 1. Four major components of the family-systems intervention model.

of job schedules, adequacy of child care arrangements, the presence of friends and neighbors who can help out in large and small emergencies, the quality of health and social services, and neighborhood safety. (p. 7)

Bronfenbrenner (1979) goes on to contend that social supports and resources available from social network members, parenting beliefs, and well-being are interrelated, and have either positive or negative consequences on parent-child interactions and child development depending on the nature of the relationships among these person and environmental factors. We used these hypothesized influences to develop our family-systems model (Dunst & Trivette, 2009a; Dunst, Trivette, & Deal, 1988, 1994) and to use the model to guide the analysis of how help-giving and family-systems practices influence the knowledge, skills, competence, and confidence of parents to interact with their children in ways that provide them learning opportunities that optimize child growth and development. The extent to which these direct and indirect effects could be discerned empirically was the focus of the meta-analysis reported in this article.

Findings from a series of research syntheses have shown the manner in which the various components of the family-systems model are related to parent, family, and child behavior and functioning (Dunst, Trivette, & Hamby, 2006a, 2007, 2008; Dunst, Trivette, Hamby, & O'Herin, 2009; Hamby, Trivette, Dunst, & O'Herin, 2009; Trivette, Dunst, Hamby, & O'Herin, 2009). In these various meta-analyses, the measures of each family-systems component were significantly related to parents' self-efficacy beliefs, parent well-being, parenting competence and confidence, family functioning,

and child behavior, albeit differentially. Help-giving practices, for example, were most strongly related to self-efficacy beliefs, whereas family strengths were most strongly related to family well-being. Similarly, adequacy of resources was most strongly related to parent well-being, whereas measures of all four model practices were related to parenting competence and confidence. The findings, taken together, helped identify the manner in which particular practices were related to a certain outcome.

In two meta-analyses of family-centered help-giving practices, we were able to ascertain both the direct and indirect effects of those practices on the study outcomes mediated by parents' self-efficacy beliefs (Bandura, 1997). One meta-analysis included 18 studies conducted on the same early childhood intervention and family support program (Dunst et al., 2006a). The other meta-analysis included 52 studies conducted in seven different countries (Dunst et al., 2008). In both research syntheses, we found that family-centered help-giving practices had either direct effects on parent, family, and child behavior and functioning or indirect effects on these same outcomes mediated by self-efficacy beliefs, or both.

In other studies in this line of research, more complex models have been tested in which the relationships between other variables were evaluated (e.g., Dunst, 1999; Dunst, Hamby, & Brookfield, 2007; Dunst & Trivette, 2009b). In the Dunst et al. (2007) study, for example, the relationships between both early intervention process and structural variables and parent and family well-being were investigated using structural equation modeling (Bentler, 1989). The process variables were relational and participatory help-giving practices (Trivette & Dunst, 2007). The structural variables were length of program involvement, service delivery location, and number and frequency of six different child services. Help-giving practices had indirect positive effects on parent and family well-being mediated by self-efficacy beliefs, whereas service intensity had a direct negative effect on parent and family well-being.

This article includes findings from a research synthesis using meta-analytic structural equation modeling (Beretvas & Furlow, 2006; Cheung & Chan, 2005; Furlow & Beretvas, 2005) for investigating the influences of family-systems intervention practices on self-efficacy beliefs, parent well-being, parent-child interactions, and child development. The procedure combines data from different studies and uses a weighted pooled correlation or (covariance) matrix to test the fit of a structural equation model to the patterns of relationships among variables in the model (Kline, 2005). We used the methodology in a number of other meta-analyses testing the effects of social support, parent well-being, and parenting self-efficacy beliefs on child behavior and development (Dunst & Masiello, in press) and the effects of family-centered practices on parent and child psychological health (Dunst & Trivette, 2009b).

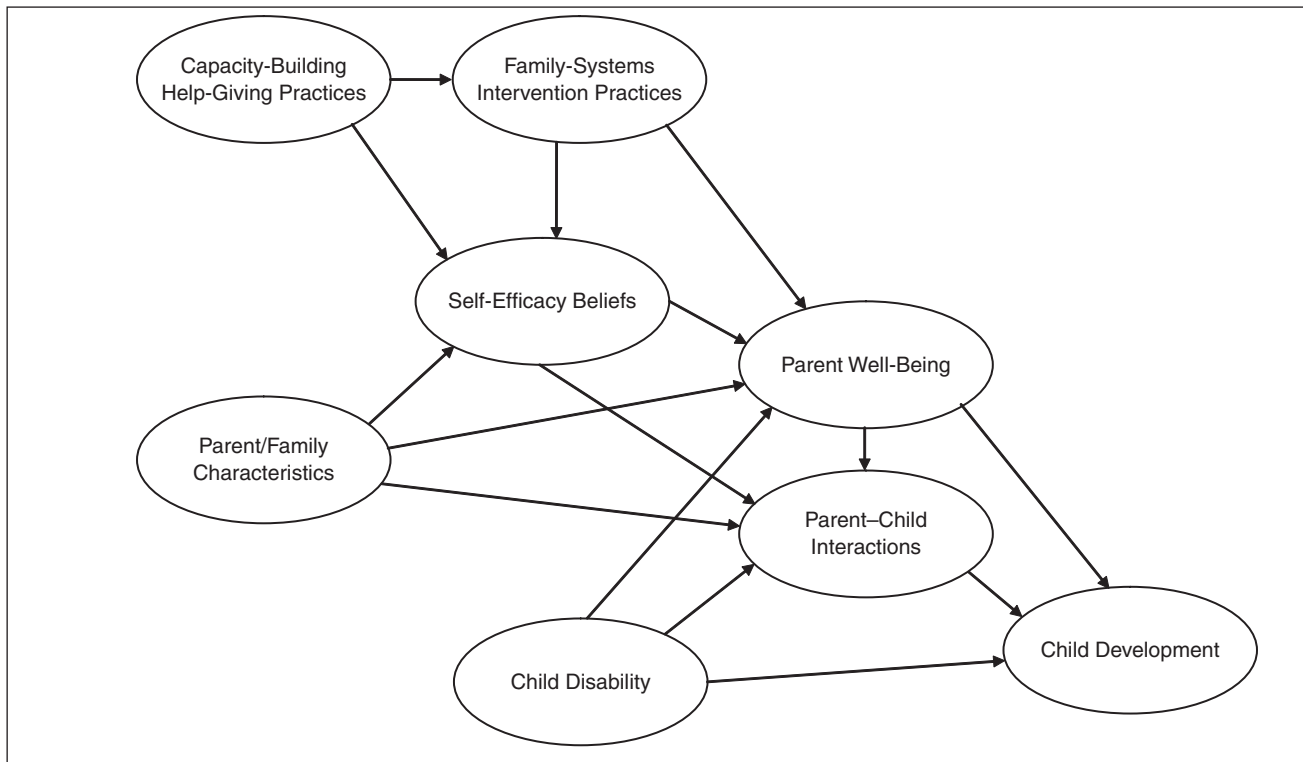


Figure 2. Model for assessing the direct and indirect effects of different predictor variables on parent-child interactions and child development.

The model we tested is shown in Figure 2 and includes capacity-building help-giving (relational and participatory) practices, family-systems intervention practices (family needs, social supports and resources, and family strengths), self-efficacy beliefs (control over practitioner help-giving and control over life events), positive and negative parent well-being, parent-child interactions, and child development. The model also includes parent, family, and child characteristics measures as determinants of parent-child interactions and child development. The different pathways in the model are based on theory and previous research showing the manner in which the variables are empirically related. The complete set of hypothesized relationships among the variables, and representative citations for the different linkages, are listed in Table 1.

The extent to which the influences of capacity-building help-giving practices and family-systems intervention practices could be traced to variations in both parent-child interactions and child development was the main focus of investigation. Help-giving and family-systems practices were expected to be directly related to both self-efficacy beliefs and parent well-being and indirectly related to parent-child interactions and child development mediated by either or both self-efficacy beliefs and parent well-being (Figure 2). The test of the full model is our first attempt to link capacity-building help-giving practices and family-systems intervention practices to parent-child interactions

and child development to ascertain if the effects of parent- and family-centered interventions can be traced to these parent and child outcomes.

The relationships between help-giving and family-systems practices and both parent-child interactions and child development were expected to be indirect and mediated by parent self-efficacy beliefs as well as parent well-being (Dunst et al., 2006a, 2008). Two types of self-efficacy beliefs were the focus of investigation: belief appraisals concerning the kinds of help and support provided by a help-giver (practitioner control appraisals) and belief appraisals involving the belief that one can execute a course of action to produce desired consequences (life events control appraisals). Practitioner control was hypothesized to have a direct effect on life events control and an indirect effect on well-being mediated by life events control appraisals (Dunst et al., 2008). Life events control was hypothesized to have a direct effect on both parent well-being and parent-child interactions and an indirect effect on parent-child interactions that is mediated by well-being. Parent well-being was measured in terms of both positive and negative effect (Diener, Larsen, Levine, & Emmons, 1985; Watson, 1988). Family-systems intervention practices were hypothesized to be directly related to well-being and indirectly related to parent-child interactions and child development mediated by well-being (e.g., DeVellis & DeVellis, 2001; Dunst et al., 2008; Teti, O'Connell, & Reiner, 1996).

Table 1. Hypothesized Relationships Among the Variables in the Structural Equation Model

Criterion measure	Hypothesized relationships	Supporting evidence ^a
Capacity-building help-giving	Directly affects family-systems practices	Dunst, Trivette, & Hamby (2006a, 2007)
	Directly affects self-efficacy beliefs	Dunst, Trivette, Boyd, & Brookfield (1994); Dunst et al. (2007)
	Indirectly affects self-efficacy beliefs	Dunst, Trivette, & Hamby (2008); Dunst and Trivette (2009b)
	Indirectly affects parent well-being	Dunst et al. (2008); Matheson et al. (2005)
Family-systems practices	Indirectly affects parent-child interactions	Belsky & Benn (1982); Dunst & Dempsey (2007)
	Indirectly affects child development	Dunst et al. (2008); Prezant & Marshak (2006)
	Directly affect self-efficacy beliefs	Affleck, Tennen, Rowe, Roscher, & Walker (1989); Dunst, Trivette, & Cornwell (1989); Saltzman & Holahan (2002)
	Directly affect parent well-being	Dunst, Trivette, & Jodry (1997); Stinnett, Lynn, Kimmons, Fuenning, & DeFrain, (1984); Turner, Lloyd, & Roszell (1999)
Self-efficacy beliefs	Indirectly affect parent-child interactions	Bonds, Gondoli, Sturge-Apple, & Salem (2002); Dumas (1986); Dunst & Trivette (1988a)
	Indirectly affect child development	Hutchings & Bywater (2007); Slykerman et al. (2005)
	Directly affect parent well-being	Affleck, Tennen, & Rowe, (1991); Raikes & Thompson (2005)
	Directly affect parent-child interactions	Dunst & Masiello (in press); Guzell & Vernon-Feagans (2004)
Parent well-being	Indirectly affect parent-child interactions	Sanders & Woolley (2005); Teti, O'Connell, & Reiner (1996)
	Indirectly affect child development	Feldman, Eidelman, & Rotenberg (2004); Steelman, Assel, Swank, Smith, & Landry (2002)
	Directly affects parent-child interactions	Armstrong, Birnie-Lefcovitch, & Ungar (2005); Dunst & Trivette (1988a)
	Directly affects child development	Hauser-Cram et al. (2001); Slykerman et al. (2005)
Parent/family characteristics	Indirectly affects child development	Garner & Estep (2001); Woolfson (2004)
	Directly affects self-efficacy beliefs	Dunst & Masiello (in press); Yau & Li-Tsang (1999)
	Directly affects parent well-being	Adler et al. (1994); Trivette & Dunst (1992)
	Directly affects parent-child interactions	Bornstein (2002); Bradley et al. (1989)
	Indirectly affects parent well-being	Liem & Liem (1978); Woolfson (2004)
	Indirectly affects parent-child interactions	Dunst & Masiello (in press); Steelman et al. (2002)
Parent-child interactions	Indirectly affects child development	Bee et al. (1982); Belsky et al. (2007); Bradley et al. (1977)
	Directly affect child development	Nievar & Becker (2008); Trivette (2007)
	Directly affects parent well-being	Barlow, Cullen-Powell, & Cheshire (2006), Saloviita, Itäläinen, & Leinonen (2003)
	Directly affects parent-child interactions	Marfo (1988); Spiker, Boyce, & Boyce (2002)
Child disability	Directly affects child development	Dunst, Trivette, & Cross (1986); Spiker et al. (2002)
	Indirectly affects parent-child interactions	Armstrong et al. (2005); Magill-Evans & Harrison (2001)

^aRepresentative sources for the hypothesized relationships among measures.

In addition to the hypothesized direct and indirect effects of help-giving and family-systems practices on parent-child interactions and child development, parent and family background characteristics were expected to have a direct effect on self-efficacy beliefs, parent well-being, and parent-child interactions and an indirect effect on

parent-child interactions mediated by both belief appraisals and well-being. These causal paths are based on research demonstrating the manner in which parent education and family socioeconomic status relates to different types of parent beliefs and behavior (e.g., Adler et al., 1994; Skinner, 1995).

Child disability was hypothesized to be negatively related to parent well-being, parent–child interactions, and child development based on research showing how a disability often affects these outcomes (e.g., Guttman, Dick, & To, 2004; Marfo, 1988; Saloviita, Itälina, & Leinonen, 2003). Findings from these studies indicate that the more complex the children’s disabilities, the more negative are the hypothesized effects on these outcomes.

Method

Studies

Eight studies conducted by us and our colleagues were included in the meta-analysis (Dunst et al., 2006a [two studies]; Dunst, Hamby, & Brookfield, 2007; Dunst & Trivette, 1988b; Holdgrafer, 1988; Trivette, Dunst, & Hamby, 1996a, 1996b; Trivette, Dunst, & Pittman, 1987). The studies were conducted in early childhood intervention, family support, human services, and health care programs in a southeastern state. All the programs served preschool children with and without disabilities or delays. The foci of these investigations were the various relationships between help-giving practices, family needs (concerns and priorities), social support, family strengths, and parent, family, and child behavior and functioning.

Participants

The eight studies included 910 participants ($M = 115$). The participants were mostly mothers (89%) but included other primary caregivers (fathers, grandparents, etc.). The parents and other caregivers were, on average, 29 years of age (range = 15–67) and had completed an average of 12 years of formal schooling (range = 0–20). The majority of the participants were White (92%), whereas the others were Black (6%) or other race or ethnicity (2%). Half (51%) of the participants worked outside their homes part- or full-time. The families’ average Hollingshead (1975) socioeconomic status (SES) score was 34 ($SD = 14$). The families’ SES covered the full socioeconomic spectrum.

The participants’ children were, on average, 27 months of age (Range = 1–89). Fifty-seven percent of the children were male. The sample included children with identified disabilities (chromosomal aberrations, physical disabilities, sensory impairments, etc.), developmental delays (global and domain specific), those who were at risk either for environmental or medical reasons, and typically developing. Fifty-four percent of the children had identified conditions, 17% had developmental delays, and 14% were at risk. The typically developing children were participants in a study examining the influences of prenatal and perinatal medical and socioenvironmental risk factors on family support,

parent well-being, parent–child interactions, and child development.

A combination of self-report, observational, and investigator-administered scales was used in the studies. The instruments, the constructs constituting the focus of analysis, the number of studies including the measures, and the reliability of the measures are shown in Table 2. The internal consistency estimates (coefficient alpha) for all the measures were generally quite high and acceptable given the small number of items on some measures (Nunnally, 1978). Additional information on the psychometric properties of the measures can be found in the individual references cited below as well as in Dunst, Trivette, and Hamby (2006b).

Measures

Capacity-building help-giving practices were measured by the *Help-Giving Practices Scale* (Trivette & Dunst, 1994) and *Family-Centered Practices Scale* (Dunst & Trivette, 2002). Both scales include relational and participatory help-giving practice indicators. Participants were asked to indicate the extent to which the practitioner working most closely with her family treated and interacted with her in a family-centered manner. The two measures were used to construct a latent variable measuring capacity-building help-giving practices.

Family needs (concerns and priorities) were measured by the *Family Resource Scale* (Dunst & Leet, 1985), *Support Functions Scale* (Dunst & Trivette, 1986), and *Protocol of Resources and Supports* (Dunst & Trivette, 1988c). Each scale measures the adequacy of or need for different types of material, instrumental, emotional, and other types of supports and resources. The total scale scores were used for the analyses, where a higher score indicates fewer needs. Social support was measured by the *Family Support Scale* (Dunst, Trivette, & Jenkins, 1986), *Inventory of Social Support* (Trivette & Dunst, 1988), *Personal Assessment of Social Support Scale* (Trivette & Dunst, 1988), and *Maternal Social Support Index* (Pascoe, Ialongo, Horn, Reinhart, & Perradatto, 1988). The four scales include both informal and formal sources of support, where respondents rate either satisfaction with or the helpfulness of support from different social network members. The total scale scores were used for the analyses, where a higher score indicates more support. Family strengths were measured by the *Family Hardiness Index* (McCubbin, McCubbin, & Thompson, 1986) and *Family Environment Scale* (Moos & Moos, 1994). Both scales measure the presence of different family qualities and attributes (commitment, communication, encouragement, etc.). The total scale score on each instrument indicates the presence of more family strengths. The measures of needs, social support, and strengths were used

Table 2. Instruments and Scales Used in the Studies Included in the Meta-Analytic Structural Equation Modeling

Instruments and scales	Construct	Number of studies	Number of items ^a	Internal consistency estimates ^b
Capacity-building help-giving practices				
<i>Help-Giving Practices Scale</i>	Relational practices	3	7	.92–.96
	Participatory practices	3	4	.79–.88
<i>Family-Centered Practices Scale</i>	Relational practices	1	6	.83
	Participatory practices	1	7	.74
Family-systems intervention practices				
<i>Family Resource Scale</i>	Family needs, concerns, and priorities	2	16–30	.92–.93
<i>Support Functions Scale</i>	Family needs, concerns, and priorities	2	12–24	.82–.93
<i>Protocol of Resources and Supports</i>	Family needs, concerns, and priorities	1	24	.93
<i>Family Support Scale</i>	Social support	3	10–19	.80–.90
<i>Inventory of Social Support</i>	Social support	2	12	.90–.95
<i>Personal Assessment of Social Support</i>	Social support	1	15	.89
<i>Maternal Social Support Index</i>	Social support	1	21	.72–.78
<i>Family Hardiness Index</i>	Family strengths	2	10–20	.84–.87
<i>Family Environmental Scale</i>	Family strengths	1	40	.73
Self-efficacy beliefs				
<i>Personal Assessment of Control Scale</i>	Control of practitioner help	3	4–5	.74–.85
	Control of life events	3	3–4	.64–.80
<i>Parental Locus of Control Efficacy Subscale</i>	Control of life events	1	9	.62
Parent well-being				
<i>CES Depression Scale</i>	Positive affect	3	4–7	.82–.89
	Negative affect	3	5–12	.76–.92
<i>Psychological Well-Being Scale</i>	Positive affect	2	5	.81–.83
	Negative affect	2	5	.70–.72
<i>Personal Well-Being Index</i>	Positive affect	2	4	.80–.83
	Negative affect	2	4	.70–.72
<i>Questionnaire on Resources and Stress Health and Mood Subscale</i>	Negative affect	1	11	.79
<i>Family Inventory of Resources and Management Health and Mastery Subscale</i>	Negative affect	2	20	.85–.88
Parent–child interactional behavior				
<i>Maternal Behavior Rating Scale</i>	Caregiver responsiveness	4	7	.92–.94
<i>Parent Child Play Scale</i>	Parent–child interactions	1	24	.95
Child development				
<i>Bayley Scales of Infant Development</i>	Mental development	3	163	.81–.93
<i>Griffiths Mental Measurements Scales</i>	Mental development	3	260–430	Not reported
<i>Wisconsin Behavior Rating Scale</i>	Adaptive development	1	218	.90

^aMeasures with a range of items indicate that full-scale as well as short-form versions of the scales were used in the studies. ^bThe internal consistency estimates were either calculated for measures that we developed or reported by the instrument developers.

to construct a latent variable measuring family-systems intervention practices.

Self-efficacy beliefs were measured by the *Personal Assessment of Control Scale* (Boyd & Dunst, 1996) and the *Parental Locus of Control Scale* (Campis, Lyman, & Prentice-Dunn, 1986) efficacy subscale. The personal assessment of control scale measures both control over the ways professionals provide help or assistance and control over life events not directly related to a help giver–help receiver relationship. The efficacy locus of control subscale measures personal control over general life events. The two

types of control appraisals were used to construct a latent variable measuring self-efficacy beliefs. They were also used as measured variables in one of the models we tested because the determinants and consequences of the two types of belief appraisals are different (Dunst et al., 2008; Dunst & Trivette, 2009b).

Parent well-being was measured by the *Center for Epidemiological Studies Depression Scale* (Radloff, 1977), *Psychological Well-Being Scale* (Bradburn, 1969), *Personal Well-Being Index* (Trivette & Dunst, 1986), *Questionnaire on Resources and Stress* (Holroyd, 1987) health and

mood subscale, and *Family Inventory for Resources and Management* (McCubbin & Comeau, 1987) health and mastery subscale. Each of the scales measures either or both positive and negative psychological well-being, which were used to construct a latent variable measuring parent well-being.

Parent interactional behavior was measured using seven items on the *Maternal Behavior Rating Scale* (Mahoney, Powell, & Finger, 1986) and the *Parent–Child Play Scale* (Dunst, 1986). The maternal rating scale items included measures of responsiveness to the child, sensitivity to the child's interests, parenting warmth, emotional expressiveness, the appropriateness of parent–child play, a parent's understanding of the child's behavior, and a parent's enjoyment of parent–child play. The play scale measures the frequency of parent–child engagement in 24 different games (finger games, rough-and-tumble play, water play, word games, etc.).

Child development was measured by the *Bayley Scales of Infant Development* (Bayley, 1969) Mental Development Index, *Griffiths Mental Measurement Scales* (Griffiths, 1954, 1970) General Development Quotient, and *Wisconsin Behavior Rating Scale* (Song et al., 1979) General Adaptive Behavior Quotient.

Parent and family characteristics included the study participants' education level and their families' socioeconomic status. Education was measured in terms of the number of years of formal schooling completed, and SES was measured by the Hollingshead (1975) scoring method. The two measures were used to construct a latent variable.

The impact of child disability was assessed by orthogonal contrast coding (Cohen, Cohen, West, & Aiken, 2003) placing the children on a continuum from those who were typically developing to those with multiple disabilities. Each child's disability status was determined from multidisciplinary assessment results and/or medical records and background information collected on the children. The ordering of the children was typically developing, at-risk (without delays), domain-specific delay, multiple-domain delays, identified conditions without physical disabilities (e.g., Down syndrome), sensory impairments, physical disabilities (e.g., cerebral palsy), and multiple disabilities. Higher scores indicate the presence of identified conditions or multiple disabilities known to be associated with developmental delays or behavior aberrations.

Method of Analysis

A two-stage meta-analytic structural equation modeling procedure was used to produce a pooled correlation matrix from the data in the eight studies and to use the pooled matrix to perform the structural equation model analysis (Cheung, 2009; Cheung & Chan, 2009). The first step involved a test of the homogeneity of the correlation matrices from the individual studies. The patterns of correlations among the

variables in the different studies need to be relatively similar in order to produce a pooled matrix. Inasmuch as the different studies in the meta-analysis did not include all the SEM variables because of different research objectives, the effect sizes for variables not included in a study are considered missing at random (Cheung, in press). *Missing at random* in a MASEM simply means that one or more measures (Table 2) were not included in a particular study and therefore were not available for analysis. The second step is to obtain a weighted pooled correlation matrix and fit the hypothesized model to the pooled correlation matrix to test the fit of the structural equation model to the data.

The root mean square error of approximation (RMSEA) and its 90% confidence interval (CI) was used as the primary goodness-of-fit measure for testing the homogeneity of the correlation matrices and the fit of the SEM model to the data. RMSEA is a measure of closeness of fit of the correlation matrices and the SEM model to the data (Browne & Cudeck, 1993). The closer RMSEA is to zero, the better the fit, and an RMSEA greater than .10 is considered a poor fit (Browne & Cudeck, 1993; Schermelleh-Engel, Moosbrugger, & Müller, 2003). According to MacCallum and Austin (2000), RMSEA is the statistic of choice because "(a) it appears to be adequately sensitive to model misspecification, (b) commonly used guidelines for interpretation seem to yield appropriate conclusions, and (c) most importantly, a confidence interval is available" (p. 219). The comparative fit index (CFI) was also used to test the fit of the SEM model to the data inasmuch as CFI is the fit index of choice for SEM (Bentler, 1990). A CFI greater than .90 is considered a measure of an adequate fit (Schermelleh-Engel et al., 2003). The closer the CFI is to 1.00, the better the fit of the model to the data.

The direct, indirect, and total effects of the predictor variables on parent–child interactions and child development were all examined as part of the SEM. Direct effects are estimated statistically by the path coefficients (parameter estimates) between two measured or latent variables. Indirect effects are estimated by the product of two or more direct effects (e.g., the indirect effects of help-giving practices on parent well-being mediated by self-efficacy beliefs are estimated by the products of the path coefficients between help-giving and self-efficacy beliefs and between self-efficacy beliefs and parent well-being). The total effects are the sum of all direct and indirect effects of a predictor variable on an outcome variable and provide a measure of the overall size of effect between variables. The sizes of the direct and indirect effects were assessed by standardized path coefficients, which can range from -1.00 to 1.00 . Standardized parameter estimates were used because the measures of the same constructs in the different studies were scaled differently.

All of the analyses were performed using LISREL 8 (Jöreskog & Sörbom, 1998). The SEM was performed

Table 3. Weighted Pooled Correlation Matrix for the Relationships Between the Study Variables

Measures	Help giving		Family-systems practices			Efficacy beliefs		Parent well-being		Parent or family background		Child diagnosis	Outcomes	
	RP	PP	CP	SR	FS	PC	LC	PA	NA	PE	FS	DI	PI	CD
Help-giving practices														
Relational practices (RP)	-	.82***	-.03	.26***	.14***	.48***	.32***	.03	-.13***	.17***	.20***	-.07*	.01	.19***
Participatory practices (PP)		-	-.04	.18***	.04	.45***	.17***	-.03	.02	.09**	.13***	-.09**	.03	.13***
Family-systems practices														
Concerns and priorities (CR)			-	.13***	.21***	-.04	.05	.26***	-.34***	.07*	.14***	-.07*	.12**	.07*
Supports and resources (SR)				-	.36***	.36***	.37***	.26***	-.21***	.21***	.23***	.05	.23***	-.02
Family strengths (FS)					-	.19***	.12**	.36***	-.24***	.20***	.24***	-.02	.11**	.15***
Self-efficacy beliefs														
Practitioner control (PC)						-	.44***	.12**	-.08**	-.07*	-.10**	-.12**	-.15***	.14***
Life events control (LC)							-	.22***	-.29***	.21***	.15**	.08**	.09**	.11**
Parent well-being														
Positive affect (PA)								-	-.55***	.14***	.18***	-.01	.17***	.11**
Negative affect (NA)									-	-.22***	-.29***	.02	-.28***	-.16***
Background measures														
Parent education (PE)										-	.69***	-.03	.29***	.08**
Family SES (FS)											-	.02	.30***	.09**
Child diagnosis (DI)												-	.06*	-.32***
Outcomes														
Parent-child interactions (PI)													-	.16***
Child development (CD)														-

* $p < .05$. ** $p < .01$. *** $p < .001$.

using the weighted least squares method with the weighted correlation matrix (Table 1) as the input. LISREL permits “correct estimation of the correlation structure” (MacCallum & Austin, 2000, p. 217) and therefore the use of a correlation matrix as input. The sign of the negative parent well-being measure was reversed for the analyses to avoid artifactual suppression (Kline, 2005).

Results

Homogeneity of the Correlation Matrices

The RMSEA was .09 (CI = .08–.10), which is within the bounds for considering the different correlation matrices in the eight studies to be derived from the same population. The patterns of relationships among the variables in the different studies were therefore considered similar enough to produce a pooled correlation matrix.

Pooled Correlation Matrix

The pooled weighted correlation matrix is shown in Table 3. The procedure for producing the pooled matrix adjusts the sizes of the correlations by giving more weight to studies with larger sample sizes in a manner similar to how effect sizes are weighted in a meta-analysis (Shadish &

Haddock, 1994). The largest number of correlations are statistically significant because of the large sample size ($N = 910$) making up the pooled correlation matrix.

SEM Model I

Figure 3 shows the SEM Model I results. The RMSEA was .06 (CI = .05–.07) and CFI was .96, both of which indicate a good fit of the model to the data. The structural coefficients (factor loadings) for all the latent variables were statistically significant beyond the .0001 level, indicating that each measured variable contributed to the relationships between the latent variable and the other variables in the model. Nearly all the path coefficients (parameter estimates) were statistically significant where the direction of effects were generally consistent with predictions. The direction of effects for the relationships between help-giving practices, family-systems practices, self-efficacy beliefs, and well-being were all as expected.

Capacity-building help-giving practices were directly related to family-systems intervention practices and indirectly related to self-efficacy beliefs mediated by the family-systems latent variable ($B = .55$, $p < .001$). The more practitioners used capacity-building help-giving practices, the higher the scores on both the family-systems and self-efficacy belief measures. Family-systems practices were

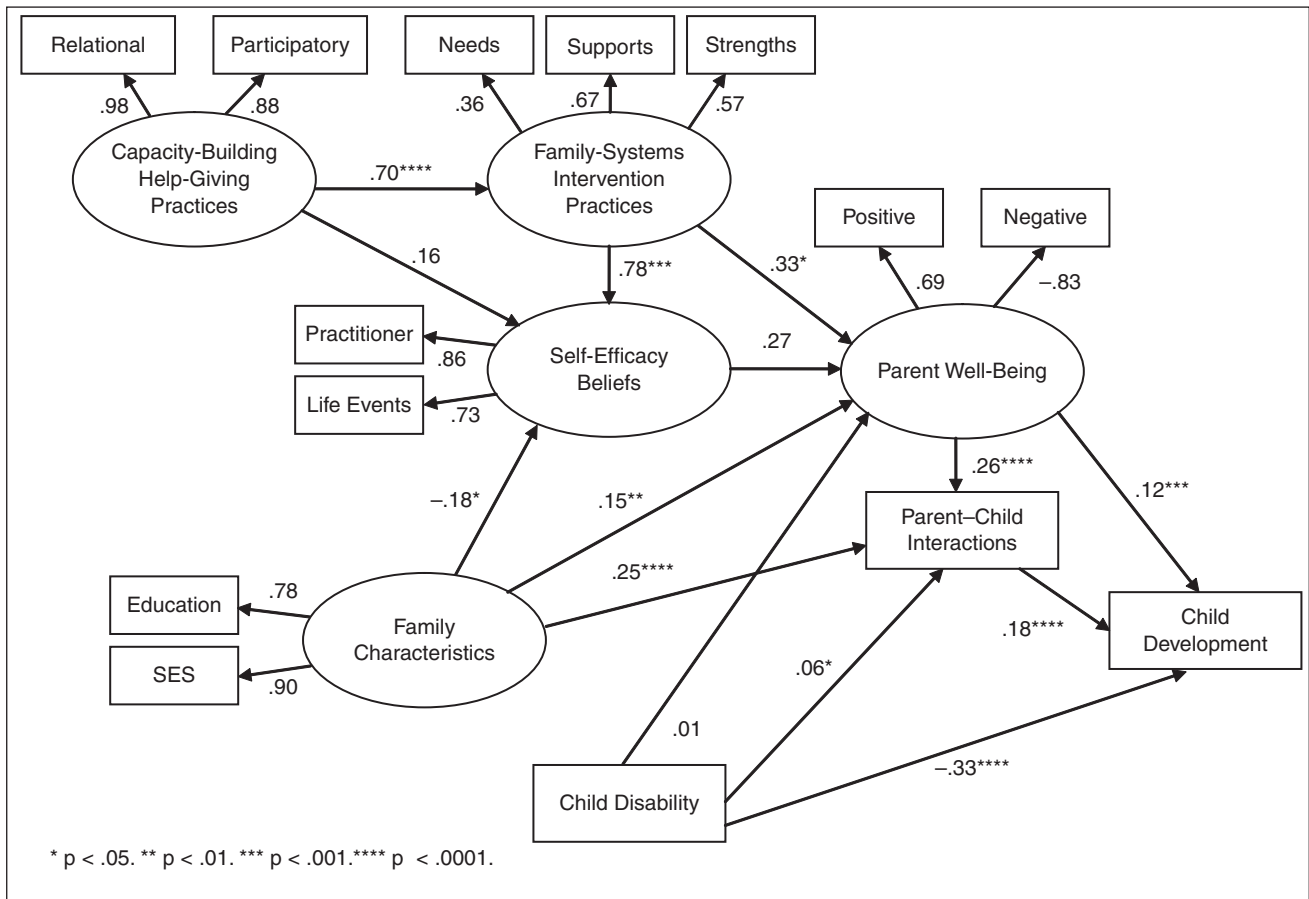


Figure 3. Structural equation model results for the relationships between help-giving, family-systems, self-efficacy, parent and family, and child characteristics on parenting and child development (Model I).

directly related to both self-efficacy beliefs and parent well-being and indirectly related to well-being mediated by belief appraisals ($B = .21, p < .08$). The more strengths and supports and the fewer needs the participants reported, the stronger their belief appraisals and the better their well-being.

Parent well-being was directly related to both parent-child interactions and child development. The more positive and less negative were participants' psychological health, the more they used responsive interactional behavior with their children and the larger were their children's developmental quotients. In turn, the more the participants used a responsive parenting style, the larger were their children's developmental quotients.

Child disability was negatively related to child development but positively related to parent-child interactions. Children with identified conditions and those with multiple disabilities had smaller developmental quotients. Contrary to expectations, the presence of a child disability was related to more responsive parenting behavior, albeit in a small way.

Parent and family characteristics were positively related to both parent well-being and parent-child interactions and

indirectly related to child development mediated both by well-being and parent-child interactions ($B = .06, p < .01$). Higher educated participants from families with higher SES backgrounds showed more positive and less negative well-being and interacted with their children in a more responsive manner. In contrast, the same parents had attenuated self-efficacy beliefs.

Although the results for the relationships between the help-giving, family-systems, mediating, and outcome variables were as expected, there was a suppression effect for the relationships involving self-efficacy beliefs because belief appraisals were measured as a latent variable. This can be discerned by examining the patterns of correlations in Table 1 for the two self-efficacy measures and the variables contiguous to these measures in the SEM Model I (Figure 3). Whereas belief appraisals involving control over practitioner help were more strongly related to help-giving practices, belief appraisals involving control over life events were more strongly related to parent well-being. This pattern of relationships has been found in almost every study and meta-analysis we have conducted (Dunst et al., 2008; Dunst, Hamby, & Brookfield, 2007; Dunst & Trivette,

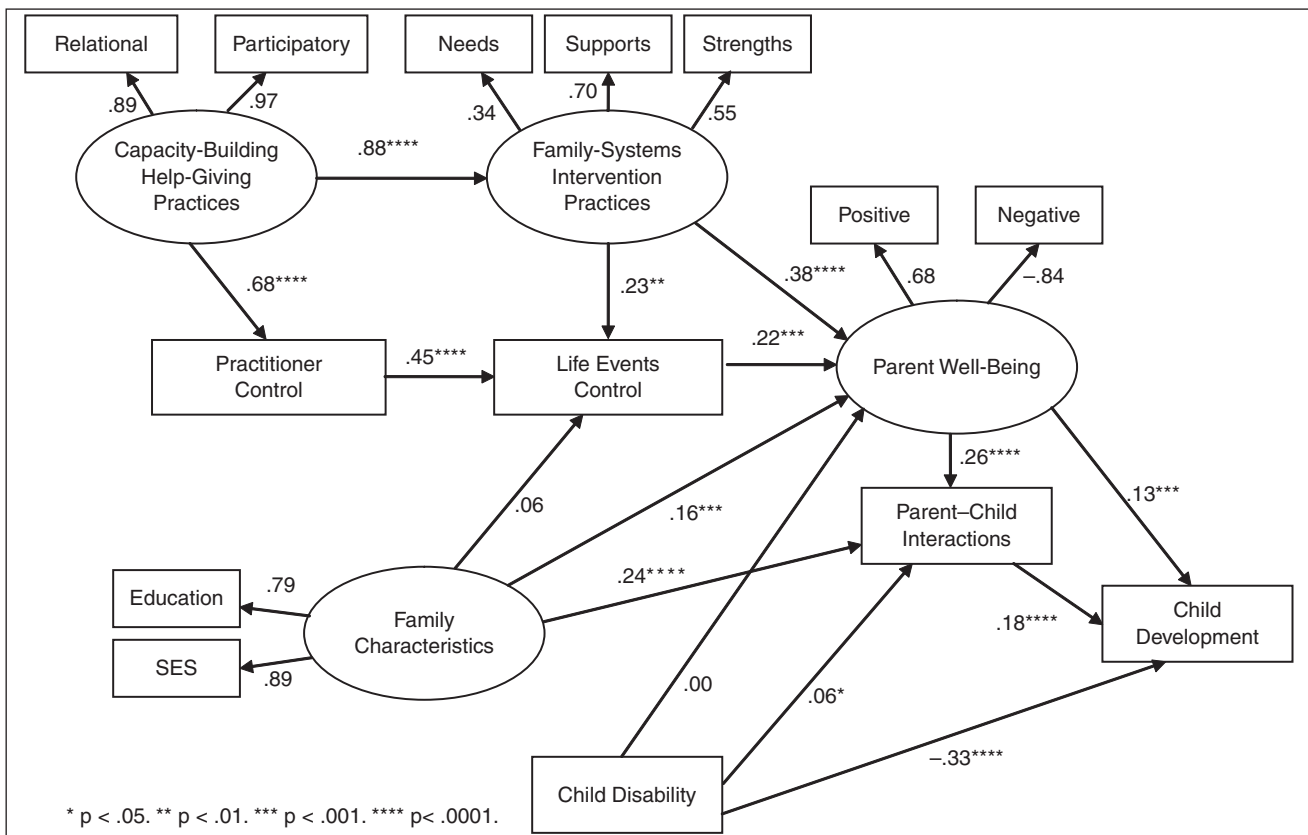


Figure 4. Respecified structural equation model results for the relationships between the study variables with the two self-efficacy belief constructs included in the SEM as measured variables (Model II).

2009b), which was the basis for testing the respecified model described next.

SEM Model II

Figure 4 shows the respecified model with the two self-efficacy belief variables included in the SEM model as measured variables. RMSEA was 0.06 (CI = .05–.07) and CFI was .95. As expected, the patterns of relationships among the help-giving, family-systems, and efficacy measures changed and were entirely consistent with expectations. Capacity-building help-giving practices were directly related to both family-systems practices and control appraisals over practitioner help, and they were indirectly related to life events control mediated by both family-systems practices and practitioner control appraisals ($B = .50, p < .0001$). Family-systems practices were also directly related to both life events control and parent well-being, and indirectly related to well-being mediated by life events control ($B = .06, p < .01$).

Life events control was directly related to parent well-being, and practitioner control appraisals were indirectly related to parent well-being mediated by life events control

($B = .10, p < .01$). The stronger the participants' self-efficacy beliefs, the more positive and less negative was their well-being. The relationships between parent well-being, parent-child interactions, and child development were the same as found in the Model I analysis.

The relationships between parent and family characteristics, child disability, and both the mediating and outcome measures were the same as in Model I except the relationship between parent and family characteristics and self-efficacy beliefs. The SEM Model II analysis found no significant relationship between these two variables.

Effects Decomposition

The decomposition of the results into direct, indirect, and total effects is shown in Table 4. The direct effects are the same as those shown in Figure 4 for the relationships between contiguous variables in the model. The indirect effects are those for all combinations of paths between two measured or latent variables and a mediating or outcome variable (e.g., the indirect effect of capacity-building help-giving practices on parent well-being are determined with the family-systems intervention practices and the two

Table 4. Direct, Indirect, and Total Effects for the Relationships Among the Study Variables

Outcome Measures	Criterion	Effects decomposition		
		Direct	Indirect	Total
Child development	Help-giving practices	–	.08***	.08***
	Family-systems practices	–	.08***	.08***
	Efficacy (practitioner)	–	.02**	.02**
	Efficacy (life events)	–	.04**	.04**
	Parent well-being	.13***	.05***	.18***
	Parent–child interaction	.18***	–	.18***
	Parent and family characteristics	–	.07***	.07***
	Child disability	–.33***	.01	–.32***
Parent–child interactions	Help-giving practices	–	.12***	.12***
	Family-systems practices	–	.11***	.11***
	Efficacy (practitioner)	–	.03**	.03**
	Efficacy (life events)	–	.06**	.06**
	Parent well-being	.26***	–	.26***
	Parent and family characteristics	.24***	.04***	.28***
Parent well-being	Child disability	.06*	.00	.06*
	Help-giving practices	–	.45***	.45***
	Family-systems practices	.38***	.05**	.43***
	Efficacy (practitioner)	–	.10**	.10**
	Efficacy (life events)	.22***	–	.22***
Life events efficacy	Parent and family characteristics	.16***	.01	.17***
	Help-giving practices	–	.50***	.50***
	Family-systems practices	.23**	–	.23**
	Efficacy (practitioner)	.45***	–	.45***
Practitioner efficacy	Parent and family characteristics	.06	–	.06
	Help-giving practices	.68***	–	.68***
	Family–systems practices	.88***	–	.88***

* $p < .05$. ** $p < .01$. *** $p < .001$. **** $p < .0001$.

self-efficacy belief measures as mediating variables). The total effects are the sum of the direct and indirect effects of one variable on another and are measures of the overall strength of relationships among measures (Kline, 2005).

Several things can be discerned from the effects decomposition. First, the results show that all the criterion variables, except for the relationship between parent and family characteristics and life events control appraisals, are significantly related to the different outcomes for the total effects and nearly all the direct and indirect effects. Second, the results show that the influences of parent–child interactions on child development (the relationship most often investigated) constitutes only one determinant of child functioning inasmuch as all of the other criterion variables are either directly or indirectly related to child development. Third, and most germane to the focus of this study, both help-giving practices and family-systems practices were indirectly related to parent–child interactions as well as child development, as evidenced by the combined total effects of both measures on those two outcomes. This is discerned by the sum of the total effects for the relationships between the

two criterion measures and parent–child interactions ($B = .23, p < .0001$) and child development ($B = .16, p < .0001$).

Further inspection of the total effects results shows that the patterns of relationships between help-giving practices, family-systems practices, and the different mediating and outcome variables are highly consistent with our SEM model (Figure 1) and the theory and research on which the hypothesized paths were based (see Table 1). Help-giving practices, for example, were related to all the dependent measures, where the strength of the relationship was strongest for variables in close proximity and became smaller but nonetheless significantly related to the two main outcomes the farther away the variables were in the model. The same was the case for the family-systems intervention practices variable. For example, family-systems practices were most strongly related to self-efficacy beliefs involving control over practitioner help-giving and less strongly related to parent–child interactions and child development. Nonetheless, both latent variables were significantly related to all mediating and outcome measures as expected, where the strength of the relationships were larger the closer the

variables are to help-giving and family-systems practices in the SEM model.

Discussion

The results from the MASEM show that the influences of capacity-building help-giving practices and family-systems intervention practices can be traced to both variations in parent-child interactions and child development mediated by self-efficacy beliefs and parent well-being. The findings also demonstrate the manner in which self-efficacy beliefs and parent well-being either or both directly and indirectly affect parent-child interactions and child development. The findings, to the best of our knowledge, constitute the first set of data showing how help-giving and family-systems practices are empirically linked to parent-child interactions and child development as evidenced by the patterns of direct, indirect, and total effects between the variables in the respecified model.

The manner in which the help-giving and family-systems variables were directly and/or indirectly related to the other variables in our model are consistent with the social systems theory that guided the original development of the model (Bronfenbrenner, 1979). According to Bronfenbrenner (1979), "whether parents can perform effectively in their child-rearing roles within the family depends on role demands, stresses, and supports emanating from other settings [where] parents' evaluations of their own capacity to [parent] are related to those factors" (p. 7). The relationships between the help-giving, family-systems, self-efficacy beliefs, parent well-being, and parent-child interaction variables found in the MASEM provided support for these hypothesized linkages. Stated differently, the ways in which help giving occurred influenced both family-systems practices and parent self-efficacy beliefs, which in turn influenced parent well-being, where both self-efficacy beliefs and parent well-being influenced parent-child interactions, which in turn influenced child development.

Early in the development of the family-systems intervention model we noted that "it may not just be [a matter] of whether needs are met but rather how the mobilization of resources and supports occur that is a major determinant" of family empowerment (Dunst, Trivette, & Deal, 1988, p. 44). Karuza, Rabinowits, and Zevon (1986) as well noted that the "effects of help not only depend on *what* is done but also *how* it is done" (p. 380, italics added). Previous meta-analyses of the effects of help-giving practices on different aspects of parent, family, and child functioning produced evidence indicating that the way help is provided indeed matters if positive consequences from that help are to be realized (Dunst et al., 2006a; Dunst et al., 2008; Dunst, Trivette, & Hamby, 2007). The findings from the meta-analysis reported in this article showed how the use of

capacity-building help-giving practices had first- (direct), second- (indirect), and higher order (total) effects on parent, parent-child, and child behavior and functioning.

The models we tested evolved from previous research evaluating the relationships between three or more variables in the models where the hypothesized linkages described earlier were supported by the study findings (e.g., Dunst et al., 2008; Dunst, Hamby, & Brookfield, 2007; Dunst & Trivette, 2009b). Meta-analytic structural equation modeling allowed us to take advantage of these previous investigations by combining data from those studies to evaluate the manner in which capacity-building help-giving practices and family needs, strengths, and supports exert influences on parent and child functioning. The yield was a better understanding of the pathways through which help-giving and family-systems practices influence parent-child interactions and child development.

The model we tested was strictly confirmatory based on theory and prior research that were the basis of the hypothesized paths. According to MacCallum (1995), "In the strictly confirmatory [SEM] strategy, the researcher constructs one model of interest and evaluates that model by fitting it to appropriate data. If the model yields interpretable parameter estimates and fits the data well, it is supported and considered a plausible model" (p. 31). This was the case in the MASEM described in this article. Notwithstanding the plausibility of our model, we consider the findings a first step in this ongoing line of research. A next step is the replication of the findings using data from studies conducted by others researchers who have included the majority of the measures that were the focus of our MASEM.

We conclude by attempting to resolve a misunderstanding concerning family-systems intervention practices and their role in other kinds of parent, parent-child, and child interventions. Critics of family-systems intervention practices claim that there is no evidence to support the use of these practices (see Dunst et al., 2008). Critics also pit family-systems practices against other kinds of practices as if they are somehow incompatible. With regard to the first criticism, the results from the MASEM indicate that there is in fact evidence to show how family-systems intervention practices are related to both parent-child interactions and child development albeit indirectly. The findings together with the results from other research reviews and meta-analyses help elucidate how and in what manner different effects and consequences are realized from the practices constituting the focus of investigation (Dempsey & Keen, 2008; Dunst, Trivette, & Hamby, 2007; King, Teplicky, King, & Rosenbaum, 2004).

In terms of the second criticism, we have noted that family-systems intervention practices, and especially capacity-building help-giving practices, are *how* other kinds of practices are implemented and are therefore complementary

to parent-child and child-focused interventions when parents and other caregivers are part of implementing the interventions (Dunst & Trivette, 2009a; Dunst et al., 2008). Family-systems intervention practices help put in place those resources and supports that ensure parents have the time and energy to interact with their children in ways that provide them development-enhancing experiences and opportunities promoting learning and development. The fact that these linkages were found in our MASEM provides support for the use of family-systems intervention practices.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interests with respect to the authorship and/or publication of this article.

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References

- Adler, N. E., Boyce, T., Chesney, M. A., Cohen, S., Folkman, S., Kahn, R. L., & Syme, S. L. (1994). Socioeconomic status and health: The challenge of the gradient. *American Psychologist, 49*, 15–24.
- Affleck, G., Tennen, H., & Rowe, J. (1991). *Infants in crisis: How parents cope with newborn intensive care and its aftermath*. New York, NY: Springer-Verlag.
- Affleck, G., Tennen, H., Rowe, J., Roscher, B., & Walker, L. (1989). Effects of formal support on mothers' adaptation to the hospital-to-home transition of high-risk infants: The benefits and costs of helping. *Child Development, 60*, 488–501.
- Armstrong, M. I., Birnie-Lefcovitch, S., & Ungar, M. T. (2005). Pathways between social support, family well being, quality of parenting, and child resilience: What we know. *Journal of Child and Family Studies, 14*, 269–281.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York, NY: Freeman.
- Barlow, J. H., Cullen-Powell, L. A., & Cheshire, A. (2006). Psychological well-being among mothers of children with cerebral palsy. *Early Child Development and Care, 176*, 421–428.
- Bayley, N. (1969). *Manual for the Bayley Scales of Infant Development*. New York, NY: Psychological Corporation.
- Bee, H. L., Barnard, K. E., Eyres, S. J., Gray, C. A., Hammond, M. A., Spietz, A. L., Snyder, C., & Clark, B. (1982). Prediction of IQ and language skill from perinatal status, child performance, family characteristics, and mother-infant interaction. *Child Development, 53*, 1134–1156.
- Belsky, J., Bell, B., Bradley, R., Stallard, N., & Stewart-Brown, S. L. (2007). Socioeconomic risk, parenting during the preschool years and child health age 6 years. *European Journal of Public Health, 17*, 508–513.
- Belsky, J., & Benn, J. (1982). Beyond bonding: A family-centered approach to enhancing early parent-infant relations. In L. A. Bond & J. M. Joffe (Eds.), *Facilitating infant and early childhood development* (pp. 281–308). Hanover, NH: University Press of New England.
- Bentler, P. (1990). Comparative fit indexes in structural models. *Psychological Bulletin, 107*, 238–246.
- Bentler, P. M. (1989). *EQS structural equations program manual*. Los Angeles, CA: BMDP Statistical Software.
- Beretvas, S. N., & Furlow, C. F. (2006). Evaluation of an approximate method for synthesizing covariance matrices for use in meta-analytic SEM. *Structural Equation Modeling, 13*, 153–185.
- Bonds, D. D., Gondoli, D. M., Sturge-Apple, M. L., & Salem, L. N. (2002). Parenting stress as a mediator of the relation between parenting support and optimal parenting. *Parenting: Science and Practice, 2*, 409–436.
- Bornstein, M. H. (Ed.). (2002). *Handbook of parenting: Vol. 4. Social conditions and applied parenting* (2nd ed.). Mahwah, NJ: Lawrence Erlbaum.
- Boyd, K., & Dunst, C. J. (1996). *Personal assessment of control scale*. Asheville, NC: Winterberry Press.
- Bradburn, N. M. (1969). *The structure of psychological well-being*. Chicago, IL: Aldine.
- Bradley, R. H., Caldwell, B. M., & Elardo, R. (1977). Home environment, social status, and mental test performance. *Journal of Educational Psychology, 69*, 697–701.
- Bradley, R. H., Caldwell, B. M., Rock, S. L., Ramey, C. T., Barnard, K. E., Gray, C., Hammong, M. A., Mitchell, S., Gottfried, A. W., Siegel, L., & Johnson, D. L. (1989). Home environment and cognitive development in the first 3 years of life: A collaborative study involving six sites and three ethnic groups in North America. *Developmental Psychology, 25*, 217–235.
- Brickman, P., Rabinowitz, V. C., Karuza, J., Jr., Coates, D., Cohn, E., & Kidder, L. (1982). Models of helping and coping. *American Psychologist, 37*, 368–384.
- Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design*. Cambridge, MA: Harvard University Press.
- Bronfenbrenner, U. (1992). Ecological systems theory. In R. Vasta (Ed.), *Six theories of child development: Revised formulations and current issues* (pp. 187–248). Philadelphia, PA: Jessica Kingsley.
- Bronfenbrenner, U. (1999). Environments in developmental perspective: Theoretical and operational models. In S. L. Friedman & T. D. Wachs (Eds.), *Measuring environment across the life span: Emerging methods and concepts* (pp. 3–28). Washington, DC: American Psychological Association.
- Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen & J. S. Long (Eds.), *Testing structural equation models* (pp. 136–162). Newbury Park, CA: Sage.

- Campis, L. K., Lyman, R. D., & Prentice-Dunn, S. (1986). The parental locus of control scale: Development and validation. *Journal of Clinical Child Psychology, 15*, 260–267.
- Cheung, M. W.-L. (in press). Fixed-effects meta-analysis as multiple-group structural equation models. *Structural Equation Modeling*.
- Cheung, M. W., & Chan, W. (2005). Meta-analytic structural equation modeling: A two-stage approach. *Psychological Methods, 10*(1), 40–64.
- Cheung, M. W. L. (2009). TSSEM: A LISREL syntax generator for two-stage structural equation modeling (Version 1.11) [Computer software and manual]. Singapore: Author. Retrieved from <http://courses.nus.edu.sg/course/psycwlm/internet/tssem.zip>
- Cheung, M. W. L., & Chan, W. (2009). A two-stage approach to synthesizing covariance matrices in meta-analytic structural equation modeling. *Structural Equation Modeling, 16*, 28–53.
- Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences* (3rd ed.). Mahwah, NJ: Lawrence Erlbaum.
- Cohen, S., & Syme, S. L. (Eds.). (1985). *Social support and health*. Orlando, FL: Academic Press.
- Dempsey, I., & Keen, D. (2008). A review of processes and outcomes in family-centered services for children with a disability. *Topics in Early Childhood Special Education, 28*, 42–52.
- DeVellis, B. M., & DeVellis, R. F. (2001). Self-efficacy and health. In A. Baum, T. A. Revenson, & J. E. Singer (Eds.), *Handbook of health psychology* (pp. 235–247). Mahwah, NJ: Lawrence Erlbaum.
- Diener, E., Larsen, R. J., Levine, S., & Emmons, R. A. (1985). Intensity and frequency: Dimensions underlying positive and negative affect. *Journal of Personality and Social Psychology, 48*, 1253–1265.
- Dumas, J. E. (1986). Indirect influence of maternal social contacts on mother–child interactions: A setting event analysis. *Journal of Abnormal Child Psychology, 14*, 205–216.
- Dunst, C. J. (1986). *Parent–Child Play Scale: A rating scale for assessing parent–child play opportunities*. Asheville, NC: Winterberry Press.
- Dunst, C. J. (1999). Placing parent education in conceptual and empirical context. *Topics in Early Childhood Special Education, 19*, 141–147.
- Dunst, C. J., & Dempsey, I. (2007). Family–professional partnerships and parenting competence, confidence, and enjoyment. *International Journal of Disability, Development, and Education, 54*, 305–318.
- Dunst, C. J., Hamby, D. W., & Brookfield, J. (2007). Modeling the effects of early childhood intervention variables on parent and family well-being. *Journal of Applied Quantitative Methods, 2*, 268–288.
- Dunst, C. J., & Leet, H. E. (1985). *Family Resource Scale: Reliability and validity*. Asheville, NC: Winterberry Press.
- Dunst, C. J., Leet, H. E., & Trivette, C. M. (1988). Family resources, personal well-being, and early intervention. *Journal of Special Education, 22*, 108–116.
- Dunst, C. J., & Masiello, T. (in press). Meta-analytic structural equation modeling of the determinants and consequences of parenting self-efficacy beliefs. In F. Columbus (Ed.), *Parenting: Styles, stresses, and strategies*. Hauppauge, NY: Nova Science.
- Dunst, C. J., & Trivette, C. M. (1986). *Support Functions Scale: Reliability and validity*. Asheville, NC: Winterberry Press.
- Dunst, C. J., & Trivette, C. M. (1988a). Determinants of parent and child interactive behavior. In K. Marfo (Ed.), *Parent–child interaction and developmental disabilities: Theory, research, and intervention* (pp. 3–31). New York, NY: Praeger.
- Dunst, C. J., & Trivette, C. M. (1988b). A family systems model of early intervention with handicapped and developmentally at-risk children. In D. R. Powell (Ed.), *Parent education as early childhood intervention: Emerging directions in theory, research, and practice* (pp. 131–179). Norwood, NJ: Ablex.
- Dunst, C. J., & Trivette, C. M. (1988c). *Protocol of Resources and Support*. Unpublished scale.
- Dunst, C. J., & Trivette, C. M. (2002). *Family-Centered Practices Scale: Short form*. Asheville, NC: Winterberry Press.
- Dunst, C. J., & Trivette, C. M. (2009a). Capacity-building family systems intervention practices. *Journal of Family Social Work, 12*, 119–143.
- Dunst, C. J., & Trivette, C. M. (2009b). Meta-analytic structural equation modeling of the influences of family-centered care on parent and child psychological health. *International Journal of Pediatrics, 2009*. doi: 10.1155/2009/576840.
- Dunst, C. J., Trivette, C. M., Boyd, K., & Brookfield, J. (1994). Help-giving practices and the self-efficacy appraisals of parents. In C. J. Dunst, C. M. Trivette, & A. G. Deal (Eds.), *Supporting and strengthening families: Methods, strategies and practices* (pp. 212–220). Cambridge, MA: Brookline Books.
- Dunst, C. J., Trivette, C. M., & Cornwell, J. (1989). Family needs, social support and self-efficacy during a child’s transition to school. *Early Education and Development, 1*, 7–18.
- Dunst, C. J., Trivette, C. M., & Cross, A. H. (1986). Mediating influences of social support: Personal, family, and child outcomes. *American Journal of Mental Deficiency, 90*, 403–417.
- Dunst, C. J., Trivette, C. M., & Deal, A. (1988). *Enabling and empowering families: Principles and guidelines for practice*. Cambridge, MA: Brookline Books.
- Dunst, C. J., Trivette, C. M., & Deal, A. G. (Eds.). (1994). *Supporting and strengthening families: Methods, strategies and practices*. Cambridge, MA: Brookline Books.
- Dunst, C. J., Trivette, C. M., & Hamby, D. W. (2006a). *Family support program quality and parent, family and child benefits* (Winterberry Monograph Series). Asheville, NC: Winterberry Press.
- Dunst, C. J., Trivette, C. M., & Hamby, D. W. (2006b). *Technical manual for measuring and evaluating family support program quality and benefits* (Winterberry Monograph Series). Asheville, NC: Winterberry Press.
- Dunst, C. J., Trivette, C. M., & Hamby, D. W. (2007). Meta-analysis of family-centered helping practices research.

- Mental Retardation and Developmental Disabilities Research Reviews*, 13, 370–378.
- Dunst, C. J., Trivette, C. M., & Hamby, D. W. (2008). *Research synthesis and meta-analysis of studies of family-centered practices* (Winterberry Monograph Series). Asheville, NC: Winterberry Press.
- Dunst, C. J., Trivette, C. M., Hamby, D. W., & O'Herin, C. E. (2009). *Research synthesis of the relationship between family needs and parent, family and child outcomes* (Winterberry Research Syntheses). Asheville, NC: Winterberry Press. (in preparation).
- Dunst, C. J., Trivette, C. M., & Jenkins, V. (1986). *Family Support Scale: Reliability and validity*. Asheville, NC: Winterberry Press.
- Dunst, C. J., Trivette, C. M., & Jodry, W. (1997). Influences of social support on children with disabilities and their families. In M. Guralnick (Ed.), *The effectiveness of early intervention* (pp. 499–522). Baltimore, MD: Brookes.
- Feldman, R., Eidelman, A. I., & Rotenberg, N. (2004). Parenting stress, infant emotion regulation, maternal sensitivity, and the cognitive development of triplets: A model for parent and child influences in a unique ecology. *Child Development*, 75, 1774–1791.
- Furlow, C. F., & Beretvas, S. N. (2005). Meta-analytic methods of pooling correlation matrices for structural equation modeling under different patterns of missing data. *Psychological Methods*, 10, 227–254.
- Garner, P. W., & Estep, K. M. (2001). Emotional competence, emotion socialization, and young children's peer-related social competence. *Early Education and Development*, 12, 29–48.
- Griffiths, R. (1954). *The abilities of babies: A study in mental measurement*. London, UK: University of London Press.
- Griffiths, R. (1970). *The abilities of young children: A comprehensive system of mental measurement for the first eight years of life*. London, UK: Child Development Research Centre.
- Guttman, A., Dick, P., & To, T. (2004). Infant hospitalization and maternal depression, poverty and single parenthood: A population-based study. *Child: Care, Health and Development*, 30, 67–75.
- Guzell, J. R., & Vernon-Feagans, L. (2004). Parental perceived control over caregiving and its relationship to parent–infant interaction. *Child Development*, 75, 134–146.
- Hamby, D. W., Trivette, C. M., Dunst, C. J., & O'Herin, C. E. (2009). *Relationship between social support and parent, family and child benefits: A meta-analysis* (Winterberry Research Syntheses). Asheville, NC: Winterberry Press. (in preparation).
- Hauser-Cram, P., Warfield, M. E., Shonkoff, J. P., Krauss, M. W., Sayer, A., & Upshur, C. C. (2001). Children with disabilities: A longitudinal study of child development and parent well-being. *Monographs of the Society for Research in Child Development*, 66(3, Serial No. 266), 1–114.
- Holdgrafer, M. S. (1988). *The influence of social support on parent, family and child functioning*. Unpublished master's thesis, University of Alberta, Edmonton, Alberta, Canada.
- Hollingshead, A. B. (1975). *Four factor index of social status*. Unpublished manuscript, Yale University, Department of Sociology, New Haven, CT.
- Holroyd, J. (1987). *Questionnaire on resources and stress: For families with chronically ill or handicapped members*. Brandon, VT: Clinical Psychology.
- Hutchings, J., & Bywater, T. (2007). Parenting support can help parents to develop better relationships with their children and reduce the risk of behaviour problems. *Education Review*, 20(2), 51–61.
- Jöreskog, K. G., & Sörbom, D. (1998). *LISREL 8: Structural equation modeling with the Simplis command language*. Chicago, IL: Scientific Software International.
- Karuzza, J., Jr., Rabinowitz, V. C., & Zevon, M. A. (1986). Implications of control and responsibility on helping the aged. In M. M. Baltes & P. B. Baltes (Eds.), *The psychology of control and aging* (pp. 373–396). Hillsdale, NJ: Lawrence Erlbaum.
- King, S., Teplicky, R., King, G., & Rosenbaum, P. (2004). Family-centered service for children with cerebral palsy and their families: A review of the literature. *Seminars in Pediatric Neurology*, 11, 78–86.
- Kline, R. B. (2005). *Principles and practice of structural equation modeling* (2nd ed.). New York, NY: Guilford.
- Liem, R., & Liem, J. (1978). Social class and mental illness reconsidered: The role of economic stress and social support. *Journal of Health and Social Behavior*, 19, 139–156.
- MacCallum, R. (1995). Model specification: Procedures, strategies, and related issues. In R. H. Hoyle (Ed.), *Structural equation modeling: Concepts, issues and applications* (pp. 16–36). Thousand Oaks, CA: Sage.
- MacCallum, R. C., & Austin, J. T. (2000). Applications of structural equation modeling in psychological research. *Annual Review of Psychology*, 51, 201–226.
- Magill-Evans, J., & Harrison, M. J. (2001). Parent–child interactions, parenting stress, and developmental outcomes at 4 years. *Children's Health Care*, 30, 135–150.
- Mahoney, G., Powell, A., & Finger, I. (1986). The Maternal Behavior Rating Scale. *Topics in Early Childhood Special Education*, 6(2), 44–55.
- Marfo, K. (Ed.). (1988). *Parent–child interaction and developmental disabilities: Theory, research, and intervention*. New York, NY: Praeger.
- Matheson, K., Kelly, O., Cole, B., Tannenbaum, B., Dodd, C., & Anisman, H. (2005). Parental bonding and depressive affect: The mediating role of coping resources. *British Journal of Social Psychology*, 44, 371–395.
- McCubbin, H. I., & Comeau, J. K. (1987). FIRM: Family inventory for resources for management. In H. I. McCubbin & A. I. Thompson (Eds.), *Family assessment inventories for research and practice* (pp. 158–160). Madison: University of Wisconsin.
- McCubbin, M. A., McCubbin, H. I., & Thompson, A. I. (1986). FHI: Family Hardiness Index. In H. I. McCubbin & A. I.

- Thompson (Eds.), *Family assessment inventories for research and practice* (2nd ed., pp. 124–130). Madison: University of Wisconsin.
- Moos, R., & Moos, B. (1994). *Family Environment Scale manual: Development, applications, research* (3rd ed.). Palo Alto, CA: Consulting Psychologist Press.
- Nievar, M. A., & Becker, B. J. (2008). Sensitivity as a privileged predictor of attachment: A second perspective on De Wolff and van IJzendoorn's meta-analysis. *Social Development, 17*, 102–114.
- Nunnally, J. C. (1978). *Psychometry theory*. New York, NY: McGraw-Hill.
- Pascoe, J. M., Ialongo, N. S., Horn, W. F., Reinhart, M. A., & Peradatto, D. (1988). The reliability and validity of the maternal social support index. *Family Medicine, 20*, 271–276.
- Prezant, F. P., & Marshak, L. (2006). Helpful actions seen through the eyes of parents of children with disabilities *Disability and Society, 21*, 31–45.
- Radloff, L. S. (1977). The CES-D scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement, 1*, 385–401.
- Raikes, H. A., & Thompson, R. A. (2005). Efficacy and social support as predictors of parenting stress among families in poverty. *Infant Mental Health Journal, 26*, 177–190.
- Rappaport, J. (1981). In praise of paradox: A social policy of empowerment over prevention. *American Journal of Community Psychology, 9*, 1–25.
- Saloviita, T., Itälina, M., & Leinonen, E. (2003). Explaining the parental stress of fathers and mothers caring for a child with intellectual disability: A double ABCX model. *Journal of Intellectual Disability Research, 47*, 300–312.
- Saltzman, K. M., & Holahan, C. J. (2002). Social support, self-efficacy, and depressive symptoms: An integrative model. *Journal of Social and Clinical Psychology, 21*, 309–322.
- Sanders, M. R., & Woolley, M. L. (2005). The relationship between maternal self-efficacy and parenting practices: Implications for parent training. *Child: Care, Health and Development, 31*, 65–73.
- Schermelleh-Engel, K., Moosbrugger, H., & Müller, H. (2003). Evaluating the fit of structural equation models: Tests of significance and descriptive goodness-of-fit measures. *Methods of Psychological Research Online, 8*(2), 23–74. Retrieved from http://user.uni-frankfurt.de/~kscherm/schermelleh/mpr_Schermelleh.pdf.
- Shadish, W. R., & Haddock, C. K. (1994). Combining estimates of effect size. In H. Cooper & L. V. Hedges (Eds.), *The handbook of research synthesis* (pp. 261–281). New York, NY: Russell Sage.
- Skinner, E. A. (1995). *Perceived control, motivation, and coping*. Thousand Oaks, CA: Sage.
- Slykerman, R. F., Thompson, J. M. D., Pryor, J. E., Becroft, D. M. O., Robinson, E., Clark, P. M., Wild, C. J., & Mitchell, E. A. (2005). Maternal stress, social support and preschool children's intelligence. *Early Human Development, 81*, 815–821.
- Song, A., Jones, S., Lippert, J., Metzgen, K., Miller, J., & Borreca, C. (1979). *Wisconsin behavior rating scale*. Madison: Central Wisconsin Center for the Developmentally Disabled.
- Spiker, D., Boyce, G. C., & Boyce, L. K. (2002). Parent-child interactions when young children have disabilities. *International Review of Research in Mental Retardation, 25*, 35–70.
- Steelman, L. M., Assel, M. A., Swank, P. R., Smith, K. E., & Landry, S. H. (2002). Early maternal warm responsiveness as a predictor of child social skills: Direct and indirect paths of influence over time. *Applied Developmental Psychology, 23*, 135–156.
- Stinnett, N., & DeFrain, J. (1985). *Secrets of strong families*. Boston, MA: Little, Brown.
- Stinnett, N., Lynn, D., Kimmons, L., Fuenning, S., & DeFrain, J. (1984). Family strengths and personal wellness. *Wellness Perspectives, 1*, 25–31.
- Teti, D. M., O'Connell, M. A., & Reiner, C. D. (1996). Parenting sensitivity, parental depression and child health: The mediational role of parental self-efficacy. *Early Development and Parenting, 5*, 237–250.
- Trivette, C. M. (2007). *Influence of caregiver responsiveness on the development of young children with or at risk for developmental disabilities* (Winterberry Research Syntheses, Vol. 1, No. 12). Asheville, NC: Winterberry Press.
- Trivette, C. M., Deal, A., & Dunst, C. J. (1986). Family needs, sources of support, and professional roles: Critical elements of family systems assessment and intervention. *Diagnostique, 11*, 246–267.
- Trivette, C. M., & Dunst, C. J. (1986). *Personal Well-Being Index: Reliability and validity*. Asheville, NC: Winterberry Press.
- Trivette, C. M., & Dunst, C. J. (1988). *Inventory of Social Support: Reliability and validity*. Asheville, NC: Winterberry Press.
- Trivette, C. M., & Dunst, C. J. (1992). Characteristics and influences of role division and social support among mothers of preschool children with disabilities. *Topics in Early Childhood Special Education, 12*, 367–385.
- Trivette, C. M., & Dunst, C. J. (1994). *Helpgiving Practices Scale (short form)*. Asheville, NC: Winterberry Press.
- Trivette, C. M., & Dunst, C. J. (2007). *Capacity-building family-centered helpgiving practices* (Winterberry Research Reports, Vol. 1, No. 1). Asheville, NC: Winterberry Press.
- Trivette, C. M., Dunst, C. J., & Hamby, D. W. (1996a). Factors associated with perceived control appraisals in a family-centered early intervention program. *Journal of Early Intervention, 20*, 165–178.
- Trivette, C. M., Dunst, C. J., & Hamby, D. W. (1996b). Social support and coping in families of children at risk for developmental disabilities. In M. Brambring, H. Rauh, & A. Beelmann (Eds.), *Early childhood intervention: Theory, evaluation and practice* (pp. 234–264). Berlin, Germany: de Gruyter.
- Trivette, C. M., Dunst, C. J., Hamby, D. W., & O'Herin, C. E. (2009). *Meta-analysis of the influences of family strengths on parent, family and child functioning* (Winterberry Research Syntheses). Asheville, NC: Winterberry Press. (in preparation).

- Trivette, C. M., Dunst, C. J., & Pittman, D. (1987). *Relationships between family-systems intervention variables, parent and family well-being, and child development* (Unpublished manuscript). Orelena Hawks Puckett Institute, Morganton, NC.
- Turner, R. J., Lloyd, D. A., & Roszell, P. (1999). Personal resources and the social distribution of depression. *American Journal of Community Psychology, 27*, 643–672.
- Watson, D. (1988). Intraindividual and interindividual analyses of positive and negative affect: Their relation to health complaints, perceived stress, and daily activities. *Journal of Personality and Social Psychology, 54*, 1020–1030.
- Woolfson, L. (2004). Family well-being and disabled children: A psychosocial model of disability-related child behaviour problems. *British Journal of Health Psychology, 9*(1), 1–13.
- Yau, M. K.-S., & Li-Tsang, C. W. P. (1999). Adjustment and adaptation in parents of children with developmental disability in two parent families: A review of the characteristics and attributes. *British Journal of Developmental Disabilities, 45*(88, Pt. 1), 38–51.

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