Research Synthesis of Studies Investigating the Relationships Between Practitioner Beliefs and Adoption of Early Childhood Intervention Practices

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Abstract

Meta-analyses of the findings from 29 studies including 4,194 early childhood practitioners showed that different practitioner belief appraisals (endorsement, importance, self-efficacy) were related to the intent to use and the adoption and use of different kinds of early childhood practices (developmentally appropriate practices, curricular content, classroom practices, instructional practices, social climate). Endorsement was assessed in terms of practitioner beliefs regarding the support for or approval of a specific type of practice. Importance was assessed in terms of the significance or value attributed to a practice by a practitioner. Self-efficacy beliefs were assessed in terms of practitioner attributions of the likelihood that their use of a practice would have expected or anticipated consequences. The average weighted effect size (correlation coefficient) between the belief and practice measures was $r = 0.63$, although there were differential relationships between the belief and practice measures depending on type of belief and type of practice. Implications for both research and practice are described.

Introduction

Many years of research and literally hundreds of studies have demonstrated that personal belief appraisals are robust predictors of people's behavior in many domains of life (see especially Bandura, 1997; Skinner, 1995). The types of personal belief appraisals that have been the focus of investigation include, but are not limited to, self-efficacy appraisals (Holden, 1991), outcome expectations (Plourde, 2002), perceived control (Wallston, 2001), causal attributions (Porac, Ferris, & Fedor, 1983), self-beliefs (Valentine, DuBois, & Cooper, 2004), and perceived confidence (Bruder, Dunst, & Mogro-Wilson, 2011) among many other belief appraisal terms and constructs (e.g., Galejs & Pease, 2001; Paczkowski & Baker, 2007; Vandenplas-Holper, 1996).

In addition to personal control belief appraisals, belief appraisals about the perceived importance (e.g., Jambunathan, 2005; Kowalski, Pretti-Frontczak, & Johnson, 2001) and the endorsed acceptance (e.g., Miltenberger, 1990; von Brock & Elliott, 1987) of different kinds of practices have been found to be determinants of people's behavior (e.g., Reimers & Wacker, 1988). These particular types of beliefs have most often been assessed in terms of the social validity of different kinds of practices and the behavioral consequences of adopting and using the interventions (e.g., Finn & Sladeczek, 2001; Foster & Mash, 1999). Studies of these kinds of belief measures have found that stronger importance and endorsement appraisals are associated with increased adoption and use of different kinds of early childhood intervention practices (e.g., Dunst, Pace, & Hamby, 2007; Trivette, Dunst, Masiello, Gorman, & Hamby, 2009).

The purpose of the research synthesis described in this *Practical Evaluation Report* was to determine if early childhood practitioner belief appraisals were related to the adoption and use of different kinds of recommended and evidence-based early childhood practices (e.g., Bredekamp & Copple, 1997; Odom & Wolery, 2003; Sandall, Hemmeter, Smith, & McLean, 2005). The belief appraisals constituting the fo-

cus of analysis were endorsement of targeted practices (e.g., McLean, Snyder, Smith, & Sandall, 2002), perceived importance of targeted practices (e.g., Kowalski et al., 2001), and self-efficacy beliefs in terms of the successful enactment of targeted practices (e.g., Lamorey & Wilcox, 2005). Endorsement was assessed in terms of practitioner beliefs regarding the support for or approval of a specific type of practice. Importance was assessed in terms of the significance or value attributed to a practice by a practitioner. Self-efficacy beliefs were assessed in terms of practitioner attributions of the likelihood that their use of a practice would have expected or anticipated consequences.

The three types of belief measures were evaluated in terms of either the intent to adopt and implement a targeted practice or actual engagement in a targeted practice. The former was assessed in terms of practitioner self-report whereas the latter was assessed by either practitioner behavioral observations or practitioner self-report. The types of practices constituting the focus of investigation included developmentally appropriate practices (e.g., McMullen, 1997), curricular content (e.g., Lee, 2007), classroom practices (e.g., Lieber et al., 1998), instructional practices (e.g., Brown, 2005), and classroom social climate (e.g., Kontos & Dunn, 1993).

The research synthesis was conducted using a characteristics-consequences framework where the focus of analysis was the conditions under which belief appraisals were related to the adoption and use of different kinds of practices (Dunst & Trivette, 2009, in press; Dunst, Trivette, & Cutspec, 2007). The expected outcome of the research synthesis was a better understanding of which kinds of beliefs with which kinds of practices predicted practitioner intent to or adoption and use of recommended and evidence-based early childhood intervention practices (Campbell & Halbert, 2002; Lamorey & Wilcox, 2005; Sawyer & Campbell, 2009; Wilcox, Guimond, Campbell, & Moore, 2006).

Search Strategy

Studies were located using *efficacy* or *self efficacy* or *self-efficacy* or *confidence* or *self-confidence* or *beliefs* or *expectations* or *attitude* AND *early intervention* or *preschool* or *early childhood* or *special education* or *therapy* or *Head Start* as search terms. We also searched for studies using the specific names of belief measures that have been widely used in studies of early childhood practitioners (e.g., Charlesworth, Hart, Burts, & Hernandez, 1991; Guimond, Wilcox, & Lamorey, 2008).

Both controlled vocabulary and natural language searches were conducted (Lucas & Cutspec, 2007). Psychological Abstracts (PsychInfo), Educational Resource Information Center (ERIC), MEDLINE, Academic Search Premier, and Dissertation Abstracts International were searched. These were supplemented by Google Scholar, Scirus, and Ingenta searches as well as a search of an extensive EndNote Library maintained by our Institute. Hand searches of the reference sections of all identified journal articles, book chapters, books, dissertations, and unpublished papers were also examined to locate additional studies. Studies were included if the correlations between the practitioner belief measures and the different measures of early childhood practices were included in the research reports.

Search Results

Twenty-nine studies were located that included 4,194 early childhood practitioners. Appendix A lists the studies and includes selected characteristics of the early childhood intervention practitioner study participants. The average number of participants in the studies was 145 (SD = 134, Range = 10 to 574). The studies were conducted in the United States (*N* = 22 studies), China, Greece, Jordan, Korea, Taiwan, Thailand, and Turkey (1 study each).

Participants

The majority of the practitioners were female (97%). They had completed an average of 15 years of formal education (*SD* = 1.20, Range = 13 to 18). The practitioners had an average of 10 years of experience working with young children (*SD* = 3.30, Range = 4 to 15). Nearly all of the practitioners were regular early childhood teachers or child care providers.

The characteristics of the children served by the study participants are shown in Appendix B. The children were mostly 36 to 60 (*N* = 10 studies) or 36 to 72 (*N* = 7 studies) months of age. Three studies included children 36 to 48 months of age, two studies included children birth to 60 months of age, while the other seven studies included children of different ages or age ranges. The majority of the children served by the practitioners were typically developing (*N* = 15 studies) or both typically developing and environmentally at-risk (*N* = 8 studies). Four studies included practitioners serving only at-risk children and two studies included practitioners serving both typically developing children and children with (nonspecified) disabilities.

Belief Measures

Appendix C lists the belief measures used by the investigators and includes selected characteristics of the type of beliefs and type of measures. Endorsement beliefs were measured in 10 studies, importance beliefs were measured in 6 studies, and self-efficacy beliefs were measured in 7 studies. The most frequently used belief measures included the *Teacher Beliefs Scale* (8 studies) (Burts, Buchanan, Charlesworth, & Jambunathan, 2000; Charlesworth et al., 1991; Charlesworth et al., 1993) and the *Teachers' Sense of Efficacy Scale* (3 studies) (Tschannen-Moran & Hoy, 2001b). Each of the other studies included a study-specific belief measure developed by other investigators (10 studies) (e.g., Chipps, Simpson, & Brysiewicz, 2008; DiBella-McCarthy, McDaniel, & Miller, 1995; Rescorla, Hyson, Hirsh-Pasek, & Cone, 1990) or study investigator-developed measures (5 studies) (e.g., Islam, 1999; Wilcox-Herzog & Ward, 2004).

Practice Measures

The measures used to assess the adoption and use of early childhood practices and the particular types of practices measured by the scales are shown in Appendix D. Developmentally appropriate practices were the focus of investigation in 8 studies, curricular content was the focus of investigation in 14 studies, classroom practices (e.g., inclusion, organization) were the focus of investigation in 5 studies, instructional practices were the focus of investigation in 7 studies, and classroom social climate was the focus of investigation in 10 studies. The early childhood practice measures included, but were not limited to, the *Assessment Profile for Early Classroom Programs* (Abbott-Shim, Sibley, & Neel, 1992), *Classroom Assessment Scoring System* (Pianta, La Paro, & Hamre, 2008), *Early Childhood Environment Rating Scale* (Harms, Clifford, & Cryer, 1998), *Instructional Activities Scale* (Charlesworth et al., 1993), *Social Interaction Practices Questionnaire* (Odom & Brown, 1993), and *Classroom Practices Inventory* (Hyson, Hirsh-Pasek, & Rescorla, 1990).

Method of Analysis

The average pooled weighted correlations between the belief and practices measures were used as the effect sizes for the relationships among the variables constituting the focus of analysis. The 95% confidence intervals for the average effect sizes were used to determine the precision of the average weighted correlations. (The smaller a confidence interval,

the more precise the effect size estimate.) The Z-statistic was used to determine the strength of the relationships among the belief and practices measures. The relationships between the measures were examined in a number of different ways to discern which kinds of beliefs were related to which kinds of practices.

Synthesis Results

Appendix E lists the types of belief and practice measures that were the focus of analysis and the effect sizes (Pearson's correlation coefficients) for the relationships between the measures. The average effect size for all studies combined was $r = 0.63$ (95% CI = 0.62 – 0.64), $Z = 94.42$, $p = 0.0000$. Practitioners with stronger belief appraisals were more likely to propose or to actually adopt and use the different kinds of early childhood intervention practices constituting the focus of investigation.

Primary Findings

Table 1 shows the findings for the beliefs measures examined in four different ways (type of belief, type of measure, type of practice, type of outcome). The results, taken together, showed that the relationships between the belief and practice measures were all statistically significant as evidenced by Z-test with p-values beyond 0.0000. The confidence intervals for all the average effect sizes except a few were quite small, indicating that the average effect sizes were

Table 1

Average Weighted Effect Sizes (r) and 95% Confidence Intervals for Different Categorizations of Practitioner Belief Measures

| Belief Measures | Number | | Average Effect Sizes (r) | 95% Confidence Intervals | Z-test | p-value |
	Studies	Effect Sizes				
Type of Belief						
Endorsement	10	33	.74	.73 - .75	91.47	.0000
Importance	16	22	.44	.42 - .47	34.30	.0000
Self-efficacy	7	15	.16	.11 - .22	5.65	.0000
Type of Measure						
Practice Use	19	57	.66	.65 - .68	87.88	.0000
Intent to Practice	11	13	.52	.49 - .55	35.63	.0000
Type of Practice						
Curricular Content	14	18	.73	.72 - .75	92.68	.0000
Classroom Practices	5	12	.50	.46 - .54	23.95	.0000
Instructional Practices	7	14	.33	.29 - .38	14.11	.0000
Social Climate	10	15	.31	.26 - .35	12.90	.0000
Developmentally Appropriate Practices	8	11	.24	.15 - .32	5.53	.0000
Type of Outcome						
Self-Report (Practice Use)	6	15	.80	.79 - .82	93.07	.0000
Self-Report (Intent to Adopt)	11	13	.52	.49 - .55	35.63	.0000
Behavioral Observations (Practice Use)	14	42	.21	.18 - .24	13.91	.0000

very good estimates of the true (population) sizes of effect. The findings indicated that stronger belief appraisals were related to the intent to use or actual engagement in the innovative and recommended practices.

Despite the fact that all of the average effect sizes were statistically significant, there was considerable variability in the sizes of effects for the variables in each of the four belief measure categories. This was especially the case for both the type of belief measures and the type of outcome measures. As can be seen in Table 1, the relationship between endorsement beliefs and the adoption and use of targeted practices was quite large ($r = 0.74$) compared to either importance ($r = 0.44$) or self-efficacy ($r = 0.16$) beliefs. The relationship between the belief measures and practitioner self-report use of the targeted practices was also quite large ($r = 0.80$) compared to either the intent to adopt the practices ($r = 0.52$) or the independent assessment of practitioner adoption and use of the practices ($r = 0.21$).

This pattern of results to a large degree are explained by the fact that in studies measuring self-efficacy beliefs, the outcome measures were more likely to be practitioner behavioral observations of targeted practices. In contrast, in studies measuring endorsement beliefs, the outcome measures were more likely to be practitioner self-reported use of the targeted practices. This was confirmed by a 3 Between Type of Belief X 3 Between Type of Outcome chi-square analysis, $\chi^2 = 21.38$, $df = 4$, $p = 0.000$. Figure 1 shows the relationships between type of belief measure and whether the practice measures were practitioner self-report or behavioral observations of the practitioners use of the practices. In all three sets of results, the average effect sizes for the belief-behavioral observation measures are considerably smaller than those for the belief-self report relationships.

The results for the type of practice measures showed that the belief measures were most strongly related to adoption of specific curricular content or practices ($r = 0.73$) and that the belief measures were least related to adoption of developmentally appropriate practices ($r = 0.24$). The pattern of results are best explained by the fact that studies investigating curricular content typically included a specific kind of practice (literacy, computers, mathematics, etc.), whereas studies investigating developmentally appropriate practices typically included practitioner adoption of multiple kinds of practices.

Moderator Effects

The extent to which the relationships between the belief and practice measures were moderated by study or participant characteristics is shown in Table 2. The results showed, regardless of the moderator variables, that the belief and practice measures were significantly related as evidenced by Z-test results with p-values beyond 0.0000. There were, however, detectable moderator effects for particular variables. The average effect sizes for the belief-practice relationships were larger for nonjournal reports compared to journal publications, studies completed before 2000 compared to studies completed after 2000, and studies conducted in the United States compared to other countries. There were also differ-
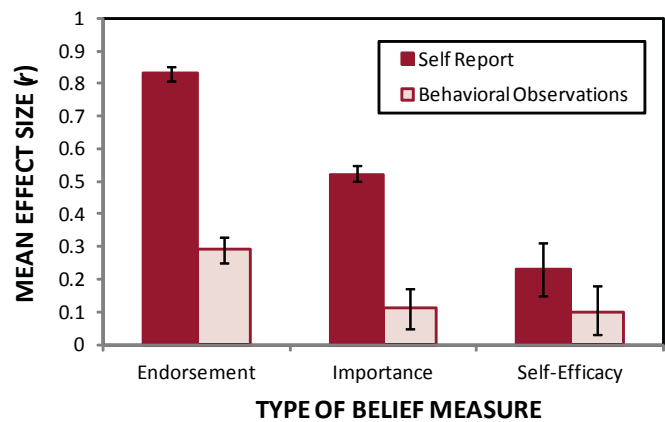
Figure 1. Average effect sizes and 95% confidence intervals for the relationships between type of belief measure and type of practice measure. (NOTE. All average effect sizes are statistically significant at the 0.009 to 0.0000 levels).

ences in the belief-practice relationships for the participant variable moderators. The average effect sizes were larger for practitioners with 10 or more years of experience compared to practitioners with fewer years of experience, children 36 months of age or older compared to children whose age ranges were both younger and older than 36 months, and children with different child conditions compared to only typically developing children.

Discussion

Results showed that different kinds of beliefs for different kinds of practices were correlated with early childhood intervention practitioner intent to use and both the adoption of and engagement in use of a variety of practices. The findings indicate that practitioner belief appraisals are at least one personal factor (Bronfenbrenner, 1999) that influences behavior intentions and enactment that are expected to have desired effects and consequences (Bandura, 1997). The pattern of results are very much like those found in studies of elementary and secondary school personnel (Skaalvik & Skaalvik, 2007, 2008) and are consistent with results of studies of allied health professionals (Chipps et al., 2008), including speech-language, physical, and occupational therapists (Harris, 2004; Minisini, Sheppard, & Jones, 2011; Salbach, Guilcher, Jaglal, & Davis, 2010; Schaper & Pervan, 2004).

The fact that the strength of the relationships between the belief and practice measures differed as a function of how practice adoption and use was measured deserves comment for two reasons. First, belief appraisals were not as strongly related to practice adoption and use when independent behavioral observations of practitioner behavior were the outcome measures. This suggests that practitioners may overestimate their use of early childhood practices when they self-report the use of the practices. Second, and not so obvious, was the fact that how belief appraisals were measured in many cases were not operationally defined by investigation which may have accounted for differences in the patterns of results. This

Table 2

Average Weighted Effect Sizes (r) and 95% Confidence Intervals for Moderators of the Relationships Between the Belief and Practice Measures

Moderators	Numbers		Average Effect Size (r)	95% Confidence Intervals	Z-test	*p*-value
	Studies	Effect Sizes				
Type of Publication						
Nonjournal Articles	10	37	.72	.70 - .73	83.97	0.0000
Journal Articles	19	33	.50	.47 - .52	46.07	0.0000
Year of Publication						
1989-1999	8	17	.76	.75 - .78	85.32	0.0000
2000-2011	21	53	.46	.44 - .48	46.20	0.0000
Country						
United States	22	60	.66	.64 - .67	90.79	0.0000
Other	7	10	.49	.45 - .52	27.44	0.0000
Practitioner Education (Average)						
14-15 Years	17	47	.66	.64 - .67	88.89	0.0000
16+ Years	7	14	.53	.49 - .56	28.06	0.0000
Practitioner Experience (Average)						
10 + Years	13	37	.71	.69 - .73	88.14	0.0000
< 10 Years	12	25	.45	.42 - .47	34.58	0.0000
Child Age (Months)						
36+	22	42	.68	.67 - .70	91.69	0.0000
Mixed	7	28	.42	.39 - .45	27.44	0.0000
Child Condition						
Mixed Conditions	14	42	.71	.70 - .73	88.90	0.0000
Typically Developing Only	15	28	.44	.42 - .47	36.86	0.0000

indicates a need for better operationalized measures in future studies.

The focus of investigation in this research synthesis was the relationship between early childhood practitioner belief appraisals and their adoption and use of innovative and recommended practices. This is but one dimension of the belief-behavior relationship. The other important aspect of practitioner beliefs is an understanding of the different factors that shape and influence belief appraisals (Bandura, 1997). Studies of factors related to variations in the self-efficacy beliefs as well as other kinds of belief appraisals of early childhood intervention practitioners shows that they are influenced by both intrapersonal and extrapersonal factors (e.g., Bailey, Palsha, & Simeonsson, 1991; Fritz, Miller-Heyl, Kreutzer, & MacPhee, 1995; Lamorey & Wilcox, 2005). In one large scale study of the factors influencing the self-confidence and self-competence beliefs of early childhood teachers and physical, occupational, and speech-language therapists, Bruder et al. (2011) found that preservice preparedness and practitioner commitment to continued performance improvement were the best predictors of enhanced efficacy beliefs. In contrast, years of professional experience, licensure or credential requirements, and professional discipline were unrelated to competence and confidence beliefs.

The importance of the research synthesis is best understood when placed in the context of a determinant-belief practices framework. The results shed light on the nature of the belief-practice linkages. A next step is a synthesis of the determinant-belief relationship.

Implications

This research synthesis has implications for both research and practice. The major implication for research is the need for studies of early childhood intervention practitioners working with young children with disabilities to determine which kinds of beliefs influence their intent to and adoption of different kinds of practices. This is true for early childhood special educators where research evidence is very limited, and is especially true for physical, occupational, and speech-language therapists where research evidence is almost non-existent. These kinds of studies would shed light on the kinds of belief appraisals held by these early childhood practitio-

ners, and help elucidate the manner in which those beliefs influence their practices. The implications for practice are straightforward. The findings indicate that there is need for attention to and assessment of practitioner belief appraisals by supervisors, coaches, trainers, and others to help identify the likelihood that a practitioner will "buy into" and adopt practices that they are asked or expected to use. This type of information would be especially useful in terms of the kinds of supports provided to practitioners. This is illustrated from the results of a study of the influences of early childhood practitioner beliefs about individual and collective responsibility for performance improvement and their appraisals of adherence to learning organization principles and practice (Dunst et al., 2011). Results showed that practitioners who possessed strong belief appraisals were more likely to take responsibility for personal and organizational learning, and in turn adopt and use early childhood intervention program practices in ways intended and expected. In contrast, practitioners who believed the onus of responsibility for their learning and performance rested with others, demonstrated little adherence to expected practices. Practitioners who had strong responsibility beliefs were provided considerable opportunity to engage in a wide range of personal and organizational learning opportunities. Those that had weak personal responsibility beliefs were provided support and coaching to affect changes in those beliefs.

In conclusion, practitioner personal belief appraisals were found to be related to their adoption and use of different kinds of early childhood intervention practices. The results add to the knowledge base regarding factors associated with practitioner engagement in desired or expected practices.

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Appendix A

Selected Characteristics of the Study Participants

Study	Number	Age (Years) Mean	Age (Years) Range	Gender Male	Gender Female	Education (Years) Mean	Education (Years) Range	Experience (Years) Mean	Experience (Years) Range	Country
Bartkowiak (1996)	173	NR	NR	NR[a]	NR	16	12-18	4	0-7	United States
Brown (2005)	20	NR	NR	NR	NR	NR	NR	NR	NR	United States
Brown et al. (2006)	52	NR	NR	NR	NR	18	16-19	14	0-38	United States
Chen & Chang (2006)	297	NR	NR	6	291	15	12-18	14	0-37	United States
Ellis (1998)	177	NR	NR	NR	NR	14	10-17	12	NR	United States
Gialamas & Nikolopoulou (2010) (Sample 1)	140	NR	NR	3	137	NR	NR	13	1-22	Greece
Guo et al. (2010)	67	NR	NR	NR	NR	15	12-18	15	0-44	United States
Hyson et al. (1989)	10	NR	NR	NR	NR	NR	NR	NR	NR	United States
Ihmeideh (2010)	154	NR	NR	0	154	NR	NR	NR	NR	Jordan
Islam (1999)	350	36	21-50	11	339	15	12-20	11	3-27	United States
Israsena (2008)	78	NR	NR	NR	NR	NR	NR	NR	NR	Thailand
Kemple et al. (2008)	57	NR	NR	0	57	14	13-16	7	5-10	United States
Kintner (2008) (Group 2)	62	42	NR	2	60	15	13-18	9	NR	United States
Kontos & Dunn (1993)	30	NR	NR	NR	NR	15	12-18	6	0-24	United States
McCarty et al. (2001)	181	NR	NR	NR	NR	14	12-16	5	3-27	United States
McMullen (1998, 1999)	20	NR	NR	1	19	17	16-18	12	3-30	United States
McMullen et al. (2005) (Sample 1)	412	NR	NR	NR	NR	16	12-18	12	1-17	United States
(Sample 2)	244	NR	NR	NR	NR	13	10-16	9	1-17	China
(Sample 3)	222	NR	NR	NR	NR	15	12-16	9	1-17	Taiwan
(Sample 4)	574	NR	NR	NR	NR	15	12-18	5	1-17	Korea
(Sample 5)	214	NR	NR	NR	NR	14	12-18	8	1-17	Turkey
Mitchell & Hedge (2002)	35	42	20-71	NR	NR	15	13-18	14	13-18	United States
Pianta et al. (2005)	238	NR	NR	17	221	15	12-16	8	NR	United States
Rohs (2008)	61	37	18-62	1	60	17	12-18	13	1-36	United States
Stipek & Byler (1997) (Preschool)	18	NR	NR	NR	NR	16	12-18	15	1-45	United States
Trivette & Raab (2011)	42	40	23-63	0	42	14	12-16	11	1-26	United States
Vartuli (1999)	137	NR	NR	NR	NR	17	13-18	13	0-32	United States
Wen et al. (2011)	58	30	22-38	NR	NR	15	12-18	9	1-25	United States
Wilcox-Herzog & Ward (2004)	71	NR	NR	NR	NR	14	12-17	9	0-29	United States

[a] NR = Not reported.

Appendix B

Characteristics of the Children Served by the Study Participants

Study	Child Age Range (Months)	Child Condition	Type of Program
Bartkowiak (1996)	0-60	Typically developing At-risk	Private nursery schools, Head Start, child care centers, preschools
Brown (2005)	NR[a]	Typically developing	Preschool
Brown et al. (2006)	48-72	Typically developing At-risk	Preschool to grade 2
Chen & Chang (2006)	36-48	Typically developing	Preschool
Ellis (1998)	36-60	At-risk	Head Start
Gialamas & Nikolopoulou (2010) (Sample 1)	48-72	Typically developing	Kindergarten
Guo et al. (2010)	41-64	Typically developing At-risk	Head Start, pre-kindergarten, preschool programs
Hyson et al. (1989)	48[b]	Typically developing	Private preschool
Ihmeideh (2010)	60[b]	Typically developing	Preschool
Islam (1999)	36-72	Typically developing At-risk	Head Start, kindergarten, grade 1
Israsena (2008)	36-72	Typically developing	NR
Kemple et al. (2008)	0-60	Typically developing At-risk	Head Start, child care centers
Kintner (2008) (Group 2)	31-60	Typically developing	Child care centers, public school pre-kindergartens
Kontos & Dunn (1993)	36-60	Typically developing	NR
McCarty et al. (2001)	36-60	At-risk	Head Start
McMullen (1998; 1999)	36-96	Typically developing	Preschool to grade 3
McMullen et al. (2005) (Sample 1)	36-72	Typically developing	Preschool
(Sample 2)	36-72	Typically developing	NR
(Sample 3)	36-72	Typically developing	NR
(Sample 4)	36-72	Typically developing	NR
(Sample 5)	36-72	Typically developing	NR
Mitchell & Hedge (2007)	36-60	Non-specified disabilities Typically developing	Preschool (inclusive)
Pianta et al. (2005)	36-48	Typically developing	Preschool
Rohs (2008)	36-60	At-risk	Head Start
Stipek & Byler (1997) (Preschool)	36-60	Typically developing At-risk	Head Start, public preschools
Trivette & Raab (2011)	36-48	At-risk	Head Start
Vartuli (1999)	36-96	Non-specified disabilities Typically developing	Head Start, public schools
Wen et al. (2011)	36-60	Typically developing At-risk	Preschools, child care centers, Head Start, Montessori, parents' day out, church-affiliated child care centers
Wilcox-Herzog & Ward (2004)	36-60	Typically developing At-risk	Private, not-for-profit, child care programs, Head Start, university-based preschool programs

[a] NR = Not reported.
[b] The children served by the practitioners were the same age.

Appendix C

Characteristics of the Practitioner Belief Measures

Study	Scale	Source	Focus	Type of Measure	Type of Belief
Bartkowiak (1996)	Teacher Beliefs Scale	Charlesworth et al. (1990)	Developmentally appropriate practice	Self-report	Importance
Brown (2005)	Teachers' Sense of Efficacy Scale	Tschannen-Moran & Woolfolk-Hoy (2001b)	Developmentally appropriate practice	Self-report	Self-Efficacy
	Teacher Beliefs in the Early Childhood Classroom Questionnaire	Kowalski et al. (2001)	Math	Self-report	Importance
Brown et al. (2006)	Teacher Beliefs Scale	Charlesworth et al. (1991); Charlesworth et al. (1993)	Developmentally appropriate practice	Self-report	Importance
Chen & Chang (2006)	Teacher Questionnaire	Landerholm (1995), adapted; International Society for Technology in Education (2000)	Computers	Self-report	Confidence
Ellis (1998)	Teacher Beliefs Scale	Charlesworth et al. (1991)	Developmentally appropriate practice	Self-report	Importance
Gialamas & Nikolopoulou (2010) (Sample 1)	Self-Efficacy Questionnaire	Nikolopoulou & Gialamas (2009)	Computers	Self-report	Self-Efficacy
Guo et al. (2010)	Teacher Self-Efficacy Questionnaire	Bandura (1997)	Developmentally appropriate practice	Self-report	Self-Efficacy
Hyson et al. (1989)	Educational Attitude Scale	Hirsh-Pasek et al. (1990)	Formal adult-directed instruction	Self-report	Endorsement
Ihmeideh (2010)	Teachers' Belief Scale	Ihmeideh (2010)	Computers	Self-report	Endorsement
Islam (1999)	Assessmental Beliefs	Islam (1999)	Literacy	Self-report	Endorsement
	Instructional Beliefs	Islam (1999)	Literacy	Self-report	Endorsement
Israsena (2007)	Teacher Beliefs Scale	Burts et al. (2000)	Developmentally appropriate practice	Self-report	Importance
	Assessment of Learner-Centered Practices	McCombs (2001)	Developmentally appropriate practice	Self-report	Endorsement
Kemple et al. (2008)	Social Interaction Practices for the Preschool Years questionnaire	Odom et al. (1993)	Developmentally appropriate practice	Self-report	Self-Efficacy
	Social Interaction Practices for the Preschool Years questionnaire (Naturally occurring activities—feasibility)	Odom et al. (1993)	Developmentally appropriate practice	Self-report	Self-Efficacy
	Social Interaction Practices for the Preschool Years questionnaire (Intensive strategies—feasibility)	Odom et al. (1993)	Inclusion	Self-report	Self-Efficacy
Kintner (2008)	Teacher Beliefs Scale	Charlesworth et al. (1991)	Developmentally appropriate practice	Self-report	Importance
	Teachers' Sense of Efficacy Scale	Tschannen-Moran & Woolfolk-Hoy (2001b)	Developmentally appropriate practice	Self-report	Self-Efficacy
Kontos & Dunn (1993)	Educational Attitude Scale—Teacher Form	Hirsh-Pasek et al. (1990)	Developmentally appropriate practice	Self-report	Endorsement
McCarty et al. (2001)	Teacher Beliefs Scale	Burts (1991)	Developmentally appropriate practice	Self-report	Importance
McMullen (1998; 1999)	Self-Efficacy Quiz	DiBella-McCarthy et al. (1995)	Education	Self-report	Self-Efficacy
	Self-Efficacy Quiz	DiBella-McCarthy et al. (1995)	Personal teaching	Self-report	Self-Efficacy
McMullen et al. (2005) (Sample 1)	Teacher Belief Scale	Charlesworth et al. (1991)	Developmentally appropriate practice	Self-report	Importance
(Sample 2)	Teacher Belief Scale	Charlesworth et al. (1991), translated	Developmentally appropriate practice	Self-report	Importance
(Sample 3)	Teacher Belief Scale	Charlesworth et al. (1991), translated	Developmentally appropriate practice	Self-report	Importance

Appendix C, *continued*

Study	Scale	Source	Focus	Type of Measure	Type of Belief
McMullen et al. (2005) (Sample 4)	Teacher Belief Scale	Charlesworth et al. (1991), translated	Developmentally appropriate practice	Self-report	Importance
(Sample 5)	Teacher Belief Scale	Charlesworth et al. (1991), translated	Developmentally appropriate practice	Self-report	Importance
Mitchell & Hedge (2007)	Teacher Belief Scale	Charlesworth et al. (1991); Charlesworth et al. (1993); Hart et al. (1990)	Developmentally appropriate practice	Self-report	Importance
	Teacher Self-Report Survey	Mitchell (2002)	Inclusion	Self-report	Endorsement
Pianta et al. (2005)	Modernity Scale	Schaefer & Edgerton (1985)	Developmentally appropriate practice	Self-report	Endorsement
Rohs (2008)	Teacher Sense of Efficacy Scale	Tschannen-Moran & Woolfolk-Hoy (2001a)	Developmentally appropriate practice	Self-report	Self-Efficacy
	Teacher Sense of Efficacy Scale (Instructional Interactions)	Tschannen-Moran & Woolfolk-Hoy (2001)	Developmentally appropriate practice	Self-report	Self-Efficacy
	Teacher Sense of Efficacy Scale (Classroom Management)	Tschannen-Moran & Woolfolk-Hoy (2001)	Developmentally appropriate practice	Self-report	Self-Efficacy
Stipek & Byler (1997) (Preschool)	Investigator-Developed Questionnaire (Child-Centered Beliefs)	Stipek et al. (1995)	Developmentally appropriate practice	Self-report	Importance
Trivette & Raab	Teacher Beliefs Scale	Charlesworth et al. (1993) (modified)	Developmentally appropriate practice	Self-report	Endorsement
	Beliefs Scale	Kim (2005)	Developmentally appropriate practice	Self-report	Endorsement
Vartuli (1999)	Early Childhood Survey of Beliefs and Practices	Marcon (1988)	Developmentally appropriate practice	Self-report	Endorsement
Wen et al. (2011)	Teacher Beliefs Scale	Charlesworth et al. (1993)	Developmentally appropriate practice	Self-report	Importance
Wilcox-Herzog & Ward (2004)	Beliefs and Intentions Questionnaire	Wilcox-Herzog & Ward (2004)	Developmentally appropriate practice	Self-report	Importance

Appendix D

Major Focus of the Early Childhood Practice Measures

Study	Scale	Source	Type of Measure	Focus
Bartkowiak (1996)	Instructional Activities Scale	Hart et al. (1990)	Self-report	Developmentally appropriate practices
Brown (2005)	Standards Observation Form	Stonewater (1993), adapted	Observation	Teaching mathematics
Brown et al. (2006)	Early Childhood Environment Rating Scale—Revised	Harms et al. (1998)	Observation	Global quality in early childhood classrooms
Chen & Chang (2006)	Teaching methods	Landerholm (1995), adapted; International Society for Technology in Education (2002)	Self-report	Teaching methods used to integrate technology
Ellis (1998)	Instructional Activities Scale (Developmentally Appropriate Practices)	Burts (1991)	Self-report	Developmentally appropriate instructional practices
	Assessment Profile for Early Childhood Programs: Research Version (learning environment)	Abbott-Shim & Sibley (1992)	Observation	Specific classroom teaching practice
	Assessment Profile for Early Childhood Programs: Research Version (scheduling)	Abbott-Shim & Sibley (1992)	Observation	Specific classroom teaching practice
	Assessment Profile for Early Childhood Programs: Research Version (curriculum)	Abbott-Shim & Sibley (1992)	Observation	Specific classroom teaching practice
	Assessment Profile for Early Childhood Programs: Research Version (interacting)	Abbott-Shim & Sibley (1992)	Observation	Specific classroom teaching practice
	Assessment Profile for Early Childhood Programs: Research Version (individualizing)	Abbott-Shim & Sibley (1992)	Observation	Specific classroom teaching practice
Gialamas & Nikolopoulou (2010) (Sample 1)	Views and Intentions	Nikolopoulou & Gialamas (2009)	Self-report	Views and intentions of integrating information and computer technology in classrooms
Guo et al. (2010)	Classroom Assessment Scoring System (Instructional)	Pianta et al. (2008)	Observation	Developmentally appropriate instructional support
	Classroom Assessment Scoring System (Emotional Support)	Pianta et al. (2008)	Observation	Developmentally appropriate emotional support
Hyson et al. (1989)	Classroom Practices Inventory	Hyson et al. (1989)	Observation	Developmentally appropriate practices including instructional focus and emotional climate
Ihmeideh (2010)	Teachers' Practice Scale	Ihmeideh (2010)	Self-report	Computer technology in teaching literacy
Islam (1999)	Learner-Centered Education: The Assessment of Learner-Centered Practices (motivation support for learning)	McCombs (2001)	Self-report	Extent to which participants conducted 14 literacy instructional activities
	Learner-Centered Education: The Assessment of Learner-Centered Practices (thinking and learning facilitation)	McCombs (2001)	Self-report	Extent to which participants conducted literacy assessment activities
Israsena (2007)	Instructional Activities Scale (Developmentally Appropriate Practices)	Burts et al. (2000)	Self-report	Appropriate or inappropriate instructional practices
	Instructional Activities Scale (Developmentally Inappropriate Practices)	Burts et al. (2000)	Self-report	Appropriate or inappropriate practices
	Learner-Centered Education: The Assessment of Learner-Centered Practices (positive interpersonal relationships)	McCombs (2001)	Self-report	Description of self, appropriate action in classroom, learner-centered and non learner-centered beliefs

Study	Scale	Source	Type of Measure	Focus
	Learner-Centered Education: The Assessment of Learner-Centered Practices (motivation support for learning)	McCombs (2001)	Self-report	Description of self, appropriate action in classroom, learner-centered and non learner-centered beliefs
	Learner-Centered Education: The Assessment of Learner-Centered Practices (thinking and learning facilitation)	McCombs (2001)	Self-report	Description of self, appropriate action in classroom, learner-centered and non learner-centered beliefs
Kemple et al. (2008)	Social Interaction Practices for the Preschool Years questionnaire (Environmental strategies—current use)	Odom et al. (1993)	Self-report	Current use of practices for promoting peer-related social competence
	Social Interaction Practices for the Preschool Years questionnaire (Natural activities—current use)	Odom et al. (1993)	Self-report	Current use of practices for promoting peer-related social competence
	Social Interaction Practices for the Preschool Years questionnaire (Intensive strategies—current use)	Odom et al. (1993)	Self-report	Current use of practices for promoting peer-related social competence
Kintner (2008)	Instructional Activities Scale	Charlesworth et al. (1991)	Self-report	Developmentally appropriate practices
	Early Childhood Environment Rating Scale—Revised	Harms et al. (1998)	Observation	Global quality in early childhood classrooms
Kontos & Dunn (1993)	Early Childhood Environment Rating Scale (Developmentally Appropriate Practices)	Harms & Clifford (1980)	Observation	Developmentally appropriate instructional activities
	Early Childhood Environment Rating Scale (Appropriate Caregiving)	Harms & Clifford (1980)	Observation	Caregiver interactions with children
McCarty et al. (2001)	Instructional Activities Scale (Developmentally Appropriate Practices)	Charlesworth et al. (1990)	Self-report	Developmentally appropriate instructional activities
McMullen et al. (2005) (Sample 1)	Instructional Activities Scale	Charlesworth et al. (1991)	Self-report	Developmentally appropriate practices
(Sample 2)	Instructional Activities Scale	Charlesworth et al. (1991)	Self-report	Developmentally appropriate practices
(Sample 3)	Instructional Activities Scale	Charlesworth et al. (1991)	Self-report	Developmentally appropriate practices
(Sample 4)	Instructional Activities Scale	Charlesworth et al. (1991)	Self-report	Developmentally appropriate practices
(Sample 5)	Instructional Activities Scale	Charlesworth et al. (1991)	Self-report	Developmentally appropriate practices
Mitchell & Hedge (2007)	Instructional Activities Scale	Charlesworth et al. (1993) (modified)	Self-report	Developmentally appropriate inclusion practices
Pianta et al. (2005)	Classroom Assessment Score System (Emotional Climate)	La Paro et al. (2004)	Observation	Positive climate, teacher sensitivity, teacher over-control (reversed), behavior management
	Classroom Assessment Score System (Instructional Climate)	La Paro et al. (2004)	Observation	Teacher productivity, concept development instructional learning format, and quality of feedback
	Early Childhood Environmental Rating Scale—Revised (Teaching and Interactions)	Harms et al. (1998)	Observation	Staff-child interactions, discipline, supervision, encouraging children to communicate, and using language to develop reasoning skills
	Early Childhood Environmental Rating Scale—Revised (Provisions for Learning)	Harms et al. (1998)	Observation	Furnishings, room arrangement, gross motor equipment, art, blocks, dramatic play, and nature or science

Appendix D, *continued*

Study	Scale	Source	Type of Measure	Focus
Pianta et al. (2005)	Emerging Academics Snapshot (Centers/Free Choice)	Ritchie et al. (2001)	Observation	Child was able to select what and where they would like to play or learn (art projects, blocks, pretend areas, puzzles, reading, puppets, computers, science areas, etc.)
Rohs (2008)	Classroom Practices Inventory-KP (Instruction)	Varulti (1992)	Observation	Developmentally appropriate and practices
	Classroom Practices Inventory-KP (Emotional Climate)	Varulti (1992)	Observation	Classroom emotional climate
Stipek & Byler (1997) (Preschool)	Investigator-Developed Questionnaire (Positive Social Climate)	Stipek et al. (1995)	Observation	Social climate of the classroom
Trivette & Raab (2011)	Child Learning Practices Observation Scale	Raab et al. (2009a)	Observation	Targeted child learning practices
	Instructional Practices Observation Scale	Raab et al. (2009b)	Observation	Targeted child environmental organization, responsive interaction, elaborations
	Classroom Assessment Scoring System (Emotional Support)	Pianta et al. (2008)	Observation	Targeted child learning practices
	Classroom Assessment Scoring System (Classroom Organization)	Pianta et al. (2008)	Observation	Targeted child learning practices
	Classroom Assessment Scoring System (Instructional Support)	Pianta et al. (2008)	Observation	Targeted child learning practices
Vartuli (1999)	Classroom Practices Inventory (Emotional Scale)	Hyson et al. (1990)	Observation	Emotional climate
	Classroom Practices Inventory (Instructional Scale)	Hyson et al. (1990)	Observation	Program or instructional focus
Wen et al. (2011)	Early Childhood Teacher Behavior Observation (Developmentally Appropriate Practices)	Wen et al. (2011)	Observation	Developmentally appropriate practices
Wilcox-Herzog & Ward (2004)	Beliefs and Intentions Questionnaire (Intentions)	Wilcox-Herzog & Ward (2004)	Self-report	Sensitivity during interactions, play style, verbal interactions, teacher involvement

Appendix E

Effect Sizes for the Relationships Between Teacher Beliefs and Early Childhood Intervention Practices

Study	Type of Belief Measure	Practice Measure	Type of Practice Measure	Focus	Effect Size (r)
Bartkowiak (1996)	Importance	Developmentally appropriate practices	Content	Intent	.00
Brown (2005)	Importance	Math	Content	Practice	.30
	Self-efficacy	Math	Content	Practice	.24
Brown et al. (2006)	Importance	Global classroom quality	Composite	Practice	.31
Chen & Chang (2006)	Self-efficacy	Computers	Content	Practice	.20
Ellis (1998)	Importance	Developmentally appropriate practices	Content	Practice	.36
		Learning environment	Organization	Practice	.17
		Schedule	Organization	Practice	.02
		Curricular	Content	Practice	.05
		Interacting	Social climate	Practice	.03
		Individualization	Inclusion	Practice	-.03
Gialamas & Nikolopoulou (2010) (Sample 1)	Self-efficacy	Computers	Instruction	Intent	.37
Guo et al. (2010)	Self-efficacy	Developmentally appropriate practices	Instruction	Practice	.17
		Developmentally appropriate practices	Social climate	Practice	.16
Hyson et al. (1989)	Endorsement	Developmentally appropriate practices	Composite	Practice	.66
Ihmeideh (2010)	Endorsement	Instructional practices	Instruction	Practice	.55
Islam (1999)	Endorsement (Practice)	Instructional practices – Literacy practices	Content	Practice	.89
	Endorsement (Assessment)	General practices – Literacy assessment	Content	Practice	.78
Israsena (2007)	Importance	Developmentally appropriate practices	Content	Practice	.44
	Endorsement	Developmentally appropriate practices	Social climate	Practice	.50
		Developmentally appropriate practices	Instruction	Practice	.60
		Developmentally appropriate practices	Instruction	Practice	.51
Kemple et al. (2008)	Endorsement (Feasibility)	Environmental strategies	Organization	Practice	.84
	Endorsement (Feasibility)	Natural activities	Social climate	Practice	.62
	Endorsement (Feasibility)	Intensive strategies	Inclusion	Practice	.63
	Endorsement (Acceptability)	Environmental strategies	Organization	Practice	.81
	Endorsement (Acceptability)	Natural activities	Social climate	Practice	.36
	Endorsement (Acceptability)	Developmentally appropriate practices	Inclusion	Practice	.44
Kintner (2008) (Group 2)	Importance	Developmentally appropriate practices	Content	Intent	.72
		Global classroom quality	Composite	Practice	.29
	Self-efficacy	Developmentally appropriate practices	Content	Intent	-.05
		Global classroom quality	Composite	Practice	-.04
Kontos & Dunn (1993)	Endorsement	Developmentally appropriate practices	Social climate	Practice	.03
		Developmentally appropriate practices	Composite	Practice	-.01
McCarty et al. (2001)	Importance	Developmentally appropriate practices	Content	Intent	.44
McMullen (1998; 1999)	Educational self-efficacy	Developmentally appropriate practices	Composite	Practice	.49
	Personal self-efficacy	Developmentally appropriate practices	Composite	Practice	.08
McMullen et al. (2005) (Sample 1)	Importance	Developmentally appropriate practices	Content	Intent	.69
(Sample 2)	Importance	Developmentally appropriate practices	Content	Intent	.31
(Sample 3)	Importance	Developmentally appropriate practices	Content	Intent	.61
(Sample 4)	Importance	Developmentally appropriate practices	Content	Intent	.47
(Sample 5)	Importance	Developmentally appropriate practices	Content	Intent	.41
Mitchell & Hedge (2007)	Importance	Developmentally appropriate practices	Inclusion	Intent	.38
	Endorsement	Developmentally appropriate practices	Inclusion	Intent	-.06

Appendix E, *continued*

Study	Type of Belief Measure	Practice Measure	Type of Practice Measure	Focus	Effect Size (r)
Pianta et al. (2005)	Endorsement	Classroom emotional climate	Social climate	Practice	.14
		Instructional practices	Instruction	Practice	.10
		Global classroom quality	Social climate	Practice	.16
		Global classroom quality	Organization	Practice	.07
		Learner-centered practices (EAS)	Instruction	Practice	.16
Rohs (2008)	Self-efficacy (Student engagement)	Developmentally appropriate practices	Instruction	Practice	-.01
		Classroom emotional climate	Social climate	Practice	.10
	Self-efficacy (Instructional interaction)	Developmentally appropriate practices	Instruction	Practice	.00
		Classroom emotional climate	Social climate	Practice	.08
	Self-efficacy (Classroom management)	Developmentally appropriate practices	Instruction	Practice	.06
		Classroom emotional climate	Social climate	Practice	.14
Stipek & Byler (1997) (Preschool)	Importance	Classroom emotional climate	Social climate	Practice	.67
Trivette & Raab (2011)	Endorsement	Developmentally appropriate practices	Instruction	Practice	.42
		Developmentally appropriate practices	Composite	Practice	.40
		Developmentally appropriate practices	Social climate	Practice	.43
		Developmentally appropriate practices	Organization	Practice	.33
		Developmentally appropriate practices	Instruction	Practice	.31
	Endorsement	Developmentally appropriate practices	Instruction	Practice	.33
		Developmentally appropriate practices	Composite	Practice	.31
		Developmentally appropriate practices	Social climate	Practice	.36
		Developmentally appropriate practices	Organization	Practice	.27
		Developmentally appropriate practices	Instruction	Practice	.18
Vartuli (1999)	Endorsement	Classroom emotional climate	Social climate	Practice	.56
		Developmentally appropriate practices	Instruction	Practice	.60
Wen et al. (2011)	Importance	Developmentally appropriate practices	Composite	Practice	-.05
Wilcox-Herzog & Ward (2004)	Importance	Developmentally appropriate practices	Composite	Intent	.25