A person-oriented approach to understanding dimensions of parenting in low-income mothers

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ABSTRACT

The purpose of this study was to examine parenting types in a low-income sample from a person-oriented approach. Data were used from a public use data set from the Early Head Start Research and Evaluation Project (EHSREP) along with new extant ratings of parenting behavior from the EHSREP archive of video-taped parent–child observations. Parenting behavior indicators were examined using latent class analysis as a grouping strategy across three time points to characterize this sample of 2631 Early Head Start mothers. Three latent classes of mothers were identified at 14, 24, and 36 months: developmentally supportive (the largest group in this sample), unsupportive, and negative. Predictors of parenting types were also examined and parenting types were linked to child outcomes. The results of these analyses show common characteristics of these distinct types of parents likely to be in Early Head Start programs and may help programs identify which families would most benefit from services to help them increase behaviors to promote their young children's early development.

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1. Introduction

Parenting is a frequent target of early intervention efforts for children at risk for later learning or behavior problems, because it is assumed to affect early development (Bradley et al., 1994; Brooks-Gunn & Markman, 2005; Love et al., 2005; Sweet & Appelbaum, 2004). Practitioners who work with parents would benefit from learning more about which aspects of parenting support early child development, but one limitation in the parenting research literature is an emphasis on specific aspects of parenting rather than on patterns of parenting that typify individual parents. Recent empirical and theoretical work has taken a person-oriented approach to studying parenting and child development (Bergman & Trost, 2006; Bornstein, Gini, Suwalsky, Putnick, & Haynes, 2006; Hirsh-Pasek & Burchinal, 2006). A person-oriented approach considers types of individuals who share a common pattern, such as a pattern of parenting. Information about types of parents can provide information to guide individualized parenting support programs and to increase our knowledge about characteristics of different types of parents.

1.1. A person-oriented approach

A person-oriented approach views individual functioning and development as an organized whole (Bergman & Magnusson, 1997;

Bergman & Trost, 2006; Magnusson & Allen, 1983). Analytic methods that take a person-oriented approach include cluster analysis and latent class analysis (LCA), both of which identify groups of individuals who share similarities in measures of particular indicators in particular areas. This approach has been increasingly applied to studies of parenting (Bergman & Trost, 2006). A recent study of low-income African American parents, for example, showed clusters of parenting patterns described as "Aggravated but Nurturant, Cognitively Stimulating, Patient and Nurturant, and Low Nurturance" (McGroder, 2000). Other recent studies have identified clusters of parents with similar ratings of emotional availability (Bornstein et al., 2006) or similar trajectories of change in caregiver sensitivity (Hirsh-Pasek & Burchinal, 2006). Some person-oriented approaches have identified patterns that typify the kinds of resources and services parents seek or are referred to for their children (Greenberg, Speltz, DeKlyen, & Jones, 2001; Leventhal, Brooks-Gunn, McCormick, & McCarton, 2000) and are compatible with recommendations for practice in early intervention programs that focus on children, parents, or both (e.g., Cocozzelli & Constable, 1986). Furthermore, a person-oriented approach to practice has been recommended for faculty who train practitioners to work with children and their families (Eaton, Gangluff, & Deere, 2004).

A variable-oriented approach generally emphasizes dimensions of individual characteristics or functioning, described as independent dimensions that vary across individuals. For example, variable-oriented approaches to parenting have been used in recent research to identify key parenting behaviors and measures during early childhood that explain variability in child social and cognitive

outcomes during the school years (Zaslow et al., 2006) and to evaluate parenting measurement equivalence for mothers and fathers (Adamsons & Buehler, 2007). Similar data, from observation or parent-report, can be used in a person-oriented approach. Although some person-oriented approaches induce profiles from qualitative observations or deduce types from theory, person-oriented analyses can also use variable-oriented data to identify prototypical patterns and profiles of individuals (e.g., McGroder, 2000). Using this strategy offers a way to identify groups of parents who share similar patterns of parenting.

1.2. Complexity of parenting

Our focus in this study is on the parenting behaviors that provide children with direct experiences that support their early development, because these direct and observable aspects of parenting are stronger predictors of children's outcomes than what parents say they do on parent report measures (Zaslow et al., 2006). Multiple studies link parenting behaviors to specific developmental outcomes (Bornstein & Tamis-LeMonda, 1989; Culp, Hubbs-Tait, Culp, & Starost, 2001; Estrada, Arsenio, Hess, & Holloway, 1987; Fewell & Deutscher, 2002; Gardner, Ward, Burton, & Wilson, 2003; Harnish, Dodge, & Valente, 1995; Hart & Risley, 1995; Hubbs-Tait, Culp, Culp, & Miller, 2002; Kelly, Morisset, Barnard, Hammond, & Booth, 1996; Lee, Murry, Brody, & Parker, 2002; National Institute of Child Health and Human Development Early Child Care Research Network [NICHD EECRN], 1999). Furthermore, many parenting behaviors are interrelated and often reflect the general quality of the parent–child relationship, which in turn, influences and is also influenced by children's characteristics and their development (Booth, Rose-Krasnor, McKinnon, & Rubin, 1994; Kochanska, 1995; Roggman, Hubbs-Tait, & Langlois, 1987; Slade, 1987; Sroufe, 1983; Suess, Grossman, & Sroufe, 1992; Youngblade, Park, & Belsky, 1993). The parent–child system is so dynamic and complex that both researchers and policy makers sometimes find themselves slicing narrow pieces of parenting to examine in relation to specific child developmental outcomes or change in hopes of improving child outcomes.

This complexity of parenting raises a limitation with the traditional research approach of identifying parenting dimensions that predict child outcomes. Developmental domains of central importance to children's later academic success are all associated with multiple inter-related aspects of early parenting (Shonkoff & Phillips, 2000). Though often applied to negative outcomes and psychopathology (Cicchetti & Rogosch, 1996; Masten, 2006), the concepts of multi-causality and multi-finality also apply to parenting. A wide variety of parenting dimensions predict more than one kind of developmental outcome in children (multi-finality), just as any particular child developmental outcome can be predicted by several dimensions of parenting (multi-causality). The critical aspects of parenting are diverse, complex, and inter-related in a system of multiple overlapping caregiving behaviors children experience. By examining how aspects of parenting co-occur within individuals, in clusters or profiles, it may become easier to conceptualize individualized approaches to promoting parenting that supports children's early development.

Theories about parenting in relation to children's development suggest possible patterns of parenting in which parents may cluster. Attachment theory (Ainsworth, Blehar, Waters, & Wall, 1978; Bowlby, 1969), for example, emphasizes the social-affective aspects of parenting that are important for secure parent–child relationships and children's overall social–emotional development, while other theories have emphasized the stimulation-communication dimension of parenting in relation to children's language development and cognitive learning (e.g., Bloom, 1984; Vygotsky, 1978). Broader parenting theories, more likely to guide early intervention

programs, emphasize an array of parenting behaviors that together, as a system or a functional set, support children's early development more broadly, across multiple developmental domains (e.g., Bradley & Caldwell, 1995; Bronfenbrenner, 1986; Guralnick, 2011; Sameroff & Fiese, 2000). Social capital theory (Coleman, 1988), for example, emphasizes developmentally supportive parenting behaviors as a form of family social capital that increases children's opportunities for life success. In addition to promoting children's development, parents also seek to control children's behavior, sometimes by harsh or negative parenting (Baumrind, 1978; Bradley & Caldwell, 1995) that predicts poor behavioral outcomes for children, particularly those from disadvantaged environments (Hughes & Ensor, 2006). These theoretical perspectives suggest three ways that parenting groups may be distinguished: by their emphasis in the social-affective or stimulation-communication dimensions of parenting, by their supportiveness of children's early development, or by their harshness and negativity toward their children.

1.3. Predictors of parenting types

Predictors of parenting profiles are important to understand because different types of parents may change in different ways, have different impacts on children, be influenced by different personal or context characteristics, benefit from different types of services, or have children with different needs. Patterns seen among parents may not consistently reflect a particular group, but certain psycho-social characteristics of parents and families have been associated with particular parenting patterns and dimensions and may also differentiate parenting types (Anderson & Fenichel, 1989; Becerra, 1998; Berlin, Brady-Smith, & Brooks-Gunn, 2002; Brooks-Gunn & Markman, 2005; Casas, Stinnett, Williams, DeFrain, & Lee, 1984; Ispa et al., 2004; McAdoo, 1998). Marital conflict, for example, is related to ineffective parenting (Buehler & Gerard, 2002), and parent attitudes about childrearing are related to the type of discipline parents use and whether their expectations of child behavior are appropriate (Dix, 1993). Other parent psycho-social characteristics, such as parenting stress, are associated with parenting negativity and low levels of involvement during parent–child interactions (Crnic & Low, 2002; Deater-Deckard & Scarr, 1996; Hauser-Cram, Warfield, Shonkoff, & Krauss, 2001; Roach, Orsmond, & Barratt, 1999). Maternal depression is associated with lower levels of responsive parenting (Diener, Nievar, & Wright, 2003; Teti, Gelfand, Messinger, & Isabella, 1995) and to more negative parenting interactions (Eamon & Zuehl, 2001; Murray, Fiori-Cowley, Hooper, & Cooper, 1996). Because these psycho-social characteristics of parents and parental functioning are associated with distinct dimensions of parenting, they are likely to differ between parenting types.

Context characteristics, such as socioeconomic status, also likely influence parenting types and dimensions (Bornstein, 2002). Ethnicity, for example, is associated with differences in parenting (Brooks-Gunn & Markman, 2005), perhaps because different culturally based goals for children's developmental outcomes may lead parents to do more to promote the outcomes they value (Hopkins & Westra, 1989). In the US, minority ethnicity is related to harsh or negative parenting (Wissow, 2001), perhaps because of high poverty levels in those populations (Aber, Jones, & Cohen, 2000). Poverty is related to several maternal and family characteristics in addition to low income: low education, single parenting, and early parenting. Lower levels of maternal education level, for example, predict less positive book reading attitudes and behavior (Berkule, Dreyer, Huberman, Fierman, & Mendelsohn, 2003; Torr, 2004). Poverty, teenage parenting, and low maternal education are associated with harsh or punitive parenting (Aber et al., 2000; Coyl,

Roggman, & Newland, 2002; Eamon & Zuehl, 2001; Holden, Miller, & Harris, 1999; Shaw & Vondra, 1995).

1.4. Parenting research in the Early Head Start Research and Evaluation Project

Several studies of parenting have been conducted using data from the Early Head Start Research and Evaluation Project (EHSREP) study. EHS had favorable impacts on several aspects of parenting: Program parents provided significantly more language and learning supports and were more likely to read to their child every day than control group parents. These aspects of parenting were related to higher vocabulary and comprehension scores at 14 months (Raikes et al., 2006) and higher vocabulary scores at ages 2 and 3 (Pan, Rowe, Singer, & Snow, 2005). These parents also scored significantly higher on several aspects of the home environment, parenting behaviors (e.g., more supportive, less detached, less likely to spank), and knowledge of child development (Administration for Children and Families [ACYF], 2006), all domains of parenting that were related to later cognitive development (Tamis-LeMonda, Shannon, Cabrera, & Lamb, 2004) and other child outcomes including social–emotional development, literacy, and school readiness (Love et al., 2005). These studies examining various aspects of early parenting in relation to children's development in this low-income ethnically diverse sample, have taken a variable-oriented approach to show the importance of parenting to early development of children at risk for later problems in school and life.

The purpose of this study was to take a person-oriented approach to analyzing parenting data from the EHSREP study along with newly obtained data from the same individuals based on observations of the archive of videotaped observations from that study. Combining these two sources of parenting data provided an opportunity for identifying, at multiple time points, groups of parents that share similar profiles of parenting and then examining how these groups differ in other individual, family, and context characteristics. We expected that parenting profiles would differ on their emphasis (social-affective versus stimulation-communication), supportiveness, or negativity. Information about parenting groups or types may be valuable for those who work with parents to help them support their children's development.

2. Method

The general methodological approach for this study was to examine extant data on parenting, using a statistical modeling procedure, latent class analysis, to identify groups of parents who share similar patterns of parenting. The sample and data are from the EHSREP study, in which qualified applicants were randomly assigned to either EHS services or a control group and parenting data were collected primarily from observations in families' homes at multiple time points. Methodologically, there are limited time points at which variables representing parenting are available from the EHSREP data set, and we examined parenting profiles at three time points, roughly ages 1, 2, and 3.

2.1. Original study procedures

EHS program staff members collected data on family and individual characteristics as part of the application process. Trained assessors interviewed parents and video-recorded parenting observations at child ages 14, 24, and 36 months. These observations occurred in families' homes as mothers interacted with their children. Parent interviews provided information, at each time point, about parent knowledge, attitudes, and psycho-social functioning. In the play observations, mothers and children were videotaped

while playing with toys in three bags using standardized instructions for a semi-structured situation used in previous research, "This activity will take about 10 minutes. We would like you and (CHILD) to spend this time with the toys in these three bags. During this activity, you may play with (CHILD) if you like. Please start with Bag 1, move on to Bag 2, and finish with Bag 3" (Berlin et al., 2002, p. 112).

2.2. Participants

Data describing parenting and contextual characteristics were available from over 2631 mothers in the EHSREP study, conducted at 17 selected Early Head Start (EHS) program sites around the United States. All EHS programs require that families have incomes below federal poverty guidelines and have either a pregnant woman or child under age 3 (under 12 m for EHSREP) to qualify for services. Participants were required to meet the eligibility criteria for Early Head Start by having either an income below the federal poverty level or a child with special needs. On average, the mothers were 23-year-old high school graduates and fathers were 26-year-old high school graduates. Although over a third of families had two parents married or living together, the remaining families had one parent, usually the mother, who was single, divorced, or separated. A little over a third of the mothers were Caucasian, a third were African-American, and a quarter were Latino and a fifth of the families reported that English was not their primary language (Love et al., 2005). Sample characteristics measured at baseline are provided in Table 1.

Although the sample is not randomly selected from the entire population of program applicants, the research program sites that were selected for the EHSREP study included all the major program approaches and were located in all regions of the country and in urban and rural settings. The families they served were highly diverse. Their purposeful selection resulted in a research sample (17 programs and 3001 families) that reflects the program approaches and family demographic characteristics of families served by Early Head Start (ACYF, 2002).

2.3. Measures

Multiple parenting measures were used that reflected parenting quality, specific parenting behaviors, and developmental support of the parenting environment. Using multiple measures of various aspects of parenting is an appropriate first step for identifying a small number of clusters that can then be compared in other ways. In addition to measures of parenting, we also include several indicators as potential predictors of parenting type. These measures include demographic characteristics and scales that measure mental health functioning, parenting knowledge, and parenting attitudes. More detail about variable selection is provided in a subsequent section.

2.3.1. Maternal parenting quality

In the EHSREP study, the quality of parenting was observed from videotapes of a semi-structured play session, and was rated by researchers at Columbia University using multiple 7-point quality rating scales. All coding for the original study was done by teams of coders trained to a criterion level of 85% agreement (within 1 point) on all 7-point scales; reliability was then maintained at over 85% based on 15% or more of the videotaped observations (Love et al., 2005). The scales used for the present analyses included ratings of both positive and negative parenting: *sensitivity, cognitive stimulation, intrusiveness, negative regard, and detachment* (Brady-Smith, O'Brien, Berlin, Ware, & Brooks-Gunn, 1999; Brady-Smith et al., 2000; Ware, Brady, O'Brien, Berlin, & Brooks-Gunn, 2000). *Sensitivity* referred to mothers being aware of and responsive to

Table 1
Sample characteristics.

Characteristics	% in sample
Race/ethnicity	
African-American	31.7%
Caucasian	34.0%
Hispanic	21.6%
Teenager at time of child's birth	30.4%
Maternal education	
9th grade or less	20.0%
10th–12th grade (no diploma or GED)	20.4%
High school diploma or GED	21.9%
Associates degree or above	4.7%
Poverty level	
100% or more of poverty	10.6%
67–99% of poverty	19.4%
33–67% of poverty	23.7%
<33%	23.1%
Employment	
Employed	21.1%
Student	19.6%
Unemployed non-student	49.5%
Social services	
Receives AFDC	26.2%
Receives Medicaid	67.1%
Receives food stamps	35.3%
Receives WIC	76.9%
Receives public assistance	5.3%
Public housing	7.3%
EHS program	51.0%
Living arrangements	
Lives with husband	34.6%
Lives with other adult(s)	46.7%
No other adults in household	11.6%
Number of children age 0–5	
No children aged 0–5	51.1%
One child aged 0–5	21.2%
Two or more children aged 0–5	6.8%
Number of children age 6–17	
No children aged 6–17	60.7%
One child aged 6–17	22.1%
Two children aged 6–17	8.0%
Three or more children aged 6–17	4.4%
Number of times the parent and child have moved	
No moves in past year	44.8%
Moved three to four times in past year	9.6%
Focus child is male	49.7%
Low birth weight (<2500 g)	5.7%
Child born before 37 weeks	9.0%

children's gestures, expressions, and signals during times of distress and nondistress in child-centered interactions that involved "tuning in" to the child. *Cognitive stimulation* referred to mothers' effortful teaching to enhance perceptual, cognitive, and linguistic development by bringing the child above the child's current developmental level. *Intrusiveness* referred to mothers exerting control in an adult-centered way rather than recognizing the child's perspective. *Negative regard* referred to mothers' expressions of discontent, anger, disapproval, and/or rejection directed toward the child. *Detachment* referred to mothers being inattentive, perfunctory, or indifferent toward the child.

2.3.2. Maternal parenting behaviors

More recently, the Parenting Interactions with Children Checklist of Observations Linked to Outcomes (PICCOLO) was used to code specific parenting behaviors from the videotapes of the observation sessions used for the ratings described above. This measure provided indicators of discrete parenting behaviors that had been examined within and between European American, African American, and Latino American families and demonstrated strong psychometric properties within each ethnic group (Roggman, Cook, Innocenti, Jump Norman, & Christiansen, 2009). For each videotaped observation, mothers were observed by

trained observers who indicated whether parents never, somewhat, or clearly demonstrated 29 parenting behaviors representing *affection*, *responsiveness*, *encouragement*, and *teaching*. Multiple behaviors (7–8) were rated in each domain, resulting in highly reliable single-factor dimensions of parenting behavior, with Cronbach's alphas over .75 for all domains (Roggman et al., 2009) and interrater reliability of .77 across domains. These domain scores were correlated with the maternal quality ratings, but the correlations were only moderate (ranging from .39 to .50 in this sample), indicating that they were appropriate to include as separate predictors. *Affection* behaviors included speaking warmly to the child, smiling at the child, praising the child, and staying physically close to the child. *Responsiveness* behaviors included paying attention to the child, changing the activity to meet the child's interests or needs, and replying to the child's words or sounds. *Encouragement* behaviors included supporting the child's choices, offering helpful suggestions, and waiting for a response after making a suggestion to the child. *Teaching* behaviors included labeling and describing objects, explaining something to the child, and asking the child for information.

2.3.3. Parenting environment

The observed quality of the *home environment* for supporting children's development was assessed in the EHSREP with subscales from the Home Observation for the Measurement of the Environment (HOME; Caldwell & Bradley, 1984), which assesses the amount and type of developmental support available to the child. The HOME uses an observational unstructured interview approach to assess parent–child interactions and parents' use of a variety of objects and experiences with toddlers that provide opportunities for stimulation and growth. The HOME has been used in many studies with a variety of ethnic/cultural groups. The internal consistency of the HOME for preschool children is reported as a Kuder–Richardson-20 coefficient of .89 for the total HOME and .67–.89 for subscales. The HOME subscales used in these analyses include *emotional responsivity/warmth*, reflecting a positive affective tone in parent–child interactions, *verbal–social interaction*, reflecting engagement with the child and inclusion in conversation and interactions with the visitor, and *language stimulation*, reflecting direct language interactions with the child. The Cronbach alphas for this sample range from .68 to .80 for subscales.

Bivariate correlations among the various parenting variables ranged from absolute values of .00–.70. While some of the items were highly correlated none of the correlations were above .80 and therefore multicollinearity is not indicated. Using multiple measures from multiple observational methods by multiple observers was possible because the sample size was sufficient to have stable standard errors across these multiple indicators. Using multiple measures is analogous to using multiple items on a survey measure, and testing a measurement model is an appropriate step in a complex model testing approach. Multiple indicators of latent classes are not assumed to be independent, and indicators correlated as high as .65 are not considered to be a violation of the assumption of conditional independence in latent class analysis, which refers to residual covariances rather than correlations (Muthén, 2002).

Stability of the parenting behavior items was measured with bivariate correlations. These correlations ranged from .24 to .60, with the more proximal correlations, between adjacent time points, in the .39–.60 range, and all stability correlations were significant at the .01 level.

2.3.4. Demographic characteristics

EHSREP variables selected from data collected as part of the EHS application process included mothers' education, age, ethnicity, family income, marital status, household size, and child gender. Because these demographic characteristics are often

intercorrelated, multivariate logistic regression models were checked for multicollinearity, and VIF for all independent variables retained in the models did not exceed 2.25.

2.3.5. Maternal depression symptoms

Mothers' symptoms of psychological depression were assessed at 14 and 36 months using the Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977), a 20-item instrument developed by the National Institute of Mental Health to detect symptoms indicative of clinical depression. This measure asks respondents to indicate the frequency during the past week that they have experienced certain situations or feelings with a 0 indicating that it occurred "rarely or none of the time" and a 3 indicating that it occurred "most or all of the time." The CES-D is a reliable measure, with Cronbach's alphas of .84–.90 in field studies and .88 in the EHSREP study.

2.3.6. Maternal parenting stress

Mothers' distress and negative perceptions of parenting interactions were assessed at 14, 24, and 36 months, using the Parenting Stress Index Short Form (PSI/SF; Abidin, 1986), 24 items from the original Parenting Stress Index that comprise two subscales, *parental distress* and *parent–child dysfunctional interaction*. The PSI/SF has test–retest reliability of .84 and Cronbach's alpha reliability of .91 for the total score. The subscales have test–retest reliabilities from .68 to .85 and Cronbach's alpha reliabilities from .80 to .87 (Abidin, 1990). Pearson correlations between the short and long forms range from .68 to .82 on the subscales. Both subscales were used in these analyses and had Cronbach's alpha reliabilities ranging from .78 to .84.

2.3.7. Family conflict

Conflict in the family, whether the mother was residing with the father or not, was assessed at 14, 24, and 36 months using a subscale of the Family Environment Scale (Moos & Moos, 1976), a measure of a family's social environment and relationships along ten dimensions. The *family conflict* subscale has been used across a wide range of family configurations and age groups, with reported reliability shown in a Cronbach's alpha of .72 (.67–.68 in this study), to indicate the extent to which a family expresses anger and aggression and whether conflict is characteristic of the family (Boyd, Gullone, Needleman, & Burt, 1997). Items were rated on a 4-point scale with 4 indicating high agreement with items such as, "we fight a lot" and "we hardly ever lose our tempers," and a high score indicates more conflict.

2.3.8. Maternal knowledge of development

Mothers' knowledge about children's early development was assessed in the EHSREP study at 14 and 24 months by items from the Knowledge of Infant Development Index (KIDI; MacPhee, 1983). The measure uses a 4-point Likert-type response with higher scores indicating stronger agreement. Cronbach's alphas for the EHS group ranged from .44 to .62, and although they did not meet an internal consistency standard of .65, the measure was included due to the importance of parental knowledge in this study.

2.3.9. Maternal parenting attitudes

Mothers' attitudes about childrearing were assessed at 24 months using The Parental Modernity Scale of Child-Rearing and Educational Beliefs (Schaefer & Edgerton, 1985) to measure traditional authoritarian and progressive democratic beliefs about children. It is a 30-item Likert-type scale with two subscales. A high *traditional* subscale score indicates a belief that children should follow adult directives; a high *progressive* subscale score indicates that the parent favors self-directed child behavior. The authors report split-half reliability to be .90 and test–retest reliability to be

.84. Both subscales were used in these analyses and had Cronbach's alphas ranging from .68 to .73.

2.3.10. Child outcomes at age 3

To address child outcomes in relation to different types of parents, we used several measures of child development outcomes that were assessed at 36 months, the end of the children's age period for this study and the time when enrollment in Early Head Start programs was ending. Children's cognitive development was assessed with the Mental Development Index (MDI) of the Bayley Scales of Infant Development-Second Edition (Bayley, 1993), and their language development was assessed with the Peabody Picture Vocabulary Test-Third Edition (PPVT-III; Dunn & Dunn, 1997). Children's social–emotional development was measured by parent report on the 19-item aggressive behavior subscale of the Child Behavior Checklist for ages 2.2–5 years (Achenbach & Rescorla, 2000) and by the ratings of child engagement with parent from videotaped observations of the semi-structured play situation (Brady-Smith et al., 1999, 2000; Ware et al., 2000).

2.4. Variable selection

Parent variables were chosen from the available data with an emphasis on parenting behavior and specific aspects of the home environment to identify parenting profiles. Our selection of variables for identifying common parenting profiles emphasized observable behavior representing dimensions of parenting that children experience directly.

Parent behaviors were coded from the videotaped observations or, in the case of the home environment variables, observed in the home environment at 14, 24, and 36 months. We included observations of parenting behavior and the home environment as comprising the child's direct experience of developmental support, and excluded parenting cognitions—attitudes and knowledge about parenting and young children—from the analyses identifying parenting profiles. Variables representing parenting cognitions were, however examined as characteristics of context and parental functioning in relation to parent behavior profiles.

Parenting variables selected for identifying parent types included 14 total parenting indicators; the same 12 indicators were used at 14 and 24 months and 11 of the previously used indicators along with 1 similar but unique indicators were used at 36 months. These indicators included four HOME (Caldwell & Bradley, 1984) subscale scores and five 7-point parent behavior ratings (Berlin et al., 2002) available in the public-use data set of the EHSREP study. Additional indicators included four PICCOLO parenting domain scores (Roggman et al., 2009) based on the same videotaped observations of mothers' interactions from the EHSREP archive of video recordings of the original assessments (available for public use from the Henry A. Murray Research Archive at Harvard University). Thus there are four indicators based on general observation during the data collection assessment visits in family homes, and nine indicators based on the semi-structured videotaped play session that provided a set of toys to offer opportunities for multiple parenting behaviors of interest. These parenting indicators thus include multiple measures from multiple reporters.

The parenting behaviors selected to identify parenting profiles are among the wide variety of developmentally supportive parenting behaviors linked to children's outcomes in the research literature and include both social-affective parenting behaviors and stimulation-communication behaviors (Shonkoff & Phillips, 2000). These parenting behaviors are represented in distinctive ways either by EHSREP public use variables or by data from our subsequent PICCOLO observations of the EHSREP archived videotapes or both. The PICCOLO variables offer reliable dimension scores, with internal consistency estimates of $alpha \geq .75$, that

Table 2
Descriptive statistics for parenting profile indicators and parent characteristic predictors across three time-points.

Parenting profile indicator	14 months (n = 2631)		24 months (n = 2119)		36 months (n = 1860)	
	Mean	SD	Mean	SD	Mean	SD
Parenting behaviors						
Sensitivity	4.43	1.32	4.52	1.14	4.51	1.05
Cognitive stimulation	3.62	1.19	3.86	1.14	3.77	1.13
Affection	1.56	0.28	1.54	0.30	1.49	0.30
Responsiveness	1.52	0.31	1.61	0.30	1.61	0.29
Encouragement	1.38	0.32	1.46	0.32	1.43	0.32
Teaching	0.91	0.35	1.08	0.35	1.08	0.35
Emotional responsivity	1.52	.31	1.61	0.30	n.a.	n.a.
Warmth	n.a.	n.a.	n.a.	n.a.	2.53	0.83
Language stimulation	3.62	1.19	3.86	1.14	10.50	2.02
Verbal/social	2.74	0.65	2.77	0.63	n.a.	n.a.
Detachment	1.62	1.01	1.44	0.87	1.24	0.60
Intrusiveness	2.48	1.23	1.86	1.04	1.59	0.78
Negative regard	1.46	0.79	1.42	0.83	1.28	0.61
Parenting characteristics						
Depression	13.65	9.82	n.a.	n.a.	8.73	6.82
Knowledge of infant development	3.05	0.41	3.37	0.42	n.a.	n.a.
Parenting distress	27.28	9.45	25.41	9.30	25.19	9.59
Dysfunctional parent–child relationship	17.54	5.90	17.23	5.87	17.76	6.28
Family conflict	1.72	0.54	1.71	0.54	1.67	0.53
Modernity attitudes						
Traditional parenting	n.a.	n.a.	18.68	4.17	n.a.	n.a.
Progressive parenting	n.a.	n.a.	20.91	3.44	n.a.	n.a.

reduce measurement error in multi-level modeling analyses. Due to the scaling differences across the measured parenting variables, standard scores were calculated and used in the modeling sequence to allow comparison of observations from different normal distributions and to facilitate interpretation.

The variables selected to examine the characteristics that may differ between parent profile types included measures of both parent and context characteristics. These variables include demographic variables of maternal education, age, and ethnicity; family income, marital status, and household size; and child gender. An additional set of parent characteristics was examined for differences between parent groups: maternal mental health variables of depression, parenting stress, and marital conflict, and parenting cognition variables of knowledge and attitudes. Descriptive statistics for model indicators and covariates across the three time points can be found in Table 2.

2.5. Data analyses

LCA (a.k.a., latent class analysis) is a statistical method commonly used for detecting subtypes of related cases from multivariate data. Conceptually, LCA is analogous to cluster analysis, but one important distinction is that the underlying construct in LCA is a categorical latent variable reflecting associations among a set of observed items, referred to as indicators. For this study, LCA classified low-income mothers in the EHSREP sample based on 14 indicators of parenting. Lazarsfeld (1954) introduced and demonstrated the uses of latent structure models to categorize individuals into classes based on a series of measured (i.e., manifest or observed) dichotomous survey items (indicators).

Recent advances in statistical algorithms (e.g., expectation maximization (EM) for maximum likelihood estimation) and statistical software meet the heavy computational demands of estimating latent models and fitting mixture models, and have thereby made it possible to estimate latent models with any type of indicator, be it nominal, count, binary, ordinal, and in the case of this study, continuous. LCA with continuous indicators is sometimes referred to as latent profile analysis (Bartholomew & Knott, 1999). Estimating LCA models in Mplus allows for missing data on the measured variables (parenting indicators) using full information maximum likelihood

(FIML) estimation that uses all available data. Maximum likelihood estimates were obtained via the expectation maximization (EM) algorithm, an iterative strategy for model estimation that elicits maximum likelihood parameter estimates for incomplete data, but does not impute missing values directly.

Parents were sampled from 17 different EHS sites. However, because the full sample used in the LCA included both program and nonprogram participants, the variable "site" would not be substantively the same across all participants. That is, for nonprogram participants in the study, site constitutes nothing more than a geographic location. However, for EHS program participants, the variable site accounts for differences in EHS programs and services. Therefore, in the LCA measurement model, site was not used to explicitly model the nested nature of the data (e.g., using multilevel modeling), but was instead used as a clustering variable to account for the non-independence of parents nested within site by adjusting the standard errors using the Yuan and Bentler (2000) sandwich estimator.

2.6. Model specification

Within latent class models, two types of parameters are estimated: conditional response probability and class membership probability. Conditional response probability refers to the probability that any one individual will respond in a particular way to any one item for every possible combination of item response and latent class membership. In this study, an example of a conditional response probability parameter would be the probability that a mother in one of the latent parenting profiles would have an observed interaction with her child coded as high on sensitivity. Conditional response probabilities are estimated for all indicators and conditional on membership in a given class. The class probability parameters identify the prevalence of each class in the population (i.e., relative frequency of class membership). With the inclusion of our covariates, an additional set of parameters was estimated and the multinomial logistic regression coefficients for each of the covariates were used to predict class membership. The developmental class was specified as the reference class.

Model parameters were estimated freely (unconstrained model, no parameter restrictions), using maximum likelihood with robust

standard error (MLR) criterion based on the expectation maximization (EM) algorithm developed by Dempster, Laird, and Rubin (1977). MLR estimation refers to estimating the model parameters for which the observed data are the most likely. MLR parameter estimation was used in this study to test whether a model with three versus two or four versus three distinct classes of parenting types is significantly more likely to produce the observed outcomes than a model with no distinct classes of parenting types. The EM algorithm is a two-step iterative process for computing the MLR estimate where there are missing data.

LCA models were tested with class-invariant variances at each of the three time-points and individual class membership was assigned according to posterior probabilities. Grouping cases by class membership, raw (unstandardized) data descriptives were examined for each of the parenting variables. Variance across classes did not vary considerably for any one of the parenting variables in either the 2-class or 3-class models, thus the models were not modified to allow class-specific variance for any class. Parenting indicators were standardized to help with model convergence (Muthén, 2002). Models were fit using Mplus (version 6.0, 2009). Multiple starting values for the estimated parameters were considered (McLachlan & Peel, 2000).

These analyses were used to identify not only parenting profiles, but also additional characteristics that differ between parents in the distinct profile groups. Following classification, eighteen discrete covariates were considered for inclusion into the LCA model. Covariates were first entered into the model and tested separately. Variables whose parameter estimate was significant at $p < .15$ were then entered into the model simultaneously. Correlates significant at $p \leq .05$ were retained in the final model. Because EHS program parameter estimates were not statistically significant, a program variable was not included in the final model.

3. Results

The purpose of the analyses was to identify discrete groups of parents who shared common patterns of parenting behavior and then to explore family and parent characteristics that differed between the groups. The results of the LCA showed three distinct parenting profiles and also revealed specific characteristics that differ between these groups of parents. The number of profiles was based on specific criteria observed at each step. The parenting profiles suggested clear differences in parenting quality. Profile item means and sample sizes are provided for each time-point in Table 3. Maternal, child, and family characteristics differed between the parenting profile groups.

3.1. Number of parent profiles

The appropriate number of classes was determined by comparing the goodness of fit of a four-class model with that of a three-class model, and the fit of a three-class model with that of a two-class model. The Akaike information criteria (AIC; Akaike, 1974) and sample size-adjusted Bayesian information criterion (SSA-BIC; Schwartz, 1978) indicate how well a model predicts the observed data and unexplained variation in the outcome variable, in this case the latent class variable, increases the value of the SSA-BIC. Therefore, the model with the lower SSA-BIC value was the one to be preferred. The SSA-BIC imposes a penalty as the number of estimated parameters increases, which is why it was used as a model fit index in the present study's analyses. Further, Nylund, Asparouhov, and Muthén's (2007) simulation study showed that SSA-BIC outperforms other information indexes such as Lo, Mendell, and Rubin (LMR; Lo, Mendell, & Rubin, 2001). Simulation studies on mixture models where data are simulated from a "true model" in which

Table 3
Profile item standardized means and sample sizes across three time-points.

Profile item	14 months			24 months			36 months		
	Develop. mean Z score (S.E.)	Unsupport. mean Z score (S.E.)	Negative mean Z score (S.E.)	Develop. mean Z score (S.E.)	Unsupport. mean Z score (S.E.)	Negative mean Z score (S.E.)	Develop. mean Z score (S.E.)	Unsupport. mean Z score (S.E.)	Negative mean Z score (S.E.)
Sample size	n = 1240	n = 695	n = 168	n = 1401	n = 559	n = 149	n = 924	n = 909	n = 218
% of sample	58.9%	33.0%	8.1%	66.4%	26.5%	7.1%	45.1%	44.3%	10.6%
Parenting behavior									
Sensitivity	0.73 (.09)	−0.36 (.14)	−1.35 (.17)	0.40 (.13)	−1.15 (.26)	−0.84 (.09)	0.52 (.06)	−0.77 (.09)	−1.72 (.12)
Cognitive stimulation	0.66 (.08)	−0.33 (.09)	−1.20 (.25)	0.34 (.11)	−0.96 (.16)	−0.64 (.08)	0.39 (.06)	−0.60 (.07)	−1.48 (.06)
Affection	0.62 (.07)	−0.21 (.08)	−1.42 (.18)	0.39 (.11)	−1.05 (.16)	−0.60 (.13)	0.49 (.06)	−0.73 (.06)	−1.54 (.12)
Responsiveness	0.56 (.08)	−0.27 (.09)	−1.01 (.11)	0.33 (.10)	−0.94 (.16)	−0.37 (.09)	0.45 (.08)	−0.66 (.13)	−1.27 (.15)
Encouragement	0.64 (.11)	−0.31 (.11)	−1.16 (.20)	0.35 (.12)	−1.00 (.20)	−0.33 (.11)	0.48 (.10)	−0.72 (.12)	−1.18 (.13)
Teaching	0.56 (.09)	−0.24 (.08)	−1.10 (.17)	0.30 (.11)	−0.85 (.12)	−0.49 (.17)	0.39 (.11)	−0.60 (.08)	−1.47 (.11)
Emotional responsivity	0.37 (.05)	0.02 (.16)	−1.31 (.61)	0.23 (.07)	−0.28 (.14)	−1.36 (.23)	n.a.	n.a.	n.a.
Warmth	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	0.24 (.07)	−0.32 (.18)	−0.82 (.41)
Language stimulation	0.32 (.09)	−0.17 (.13)	−0.54 (.25)	0.18 (.15)	−0.28 (.15)	−0.41 (.14)	0.32 (.08)	−0.36 (.15)	−0.99 (.18)
Verbal/social	0.28 (.04)	0.13 (.17)	−1.32 (.86)	0.29 (.02)	0.17 (.05)	−3.11 (.11)	n.a.	n.a.	n.a.
Detachment	−0.47 (.03)	0.03 (.15)	1.58 (.53)	−0.33 (.04)	0.97 (.37)	0.62 (.12)	−0.29 (.03)	0.11 (.05)	3.84 (.35)
Intrusiveness	−0.47 (.07)	0.33 (.12)	.53 (.13)	−0.22 (.08)	0.68 (.25)	0.34 (.17)	−0.30 (.04)	0.47 (.10)	0.55 (.24)
Negative regard	−0.35 (.04)	0.09 (.12)	.91 (.14)	−0.21 (.06)	0.69 (.30)	0.42 (.34)	−0.24 (.03)	0.44 (.13)	0.68 (.33)

Table 4
Latent class analysis model results across three time-points.

Age/no. classes	P BLRT	P Lo–Mendell–Rubin LRT	AIC	SSA-BIC	Entropy	# of classes < 1%	Class predictors retained in the final model
14 months							
3 class	.00	.00	57,637	57,758	.78	0	Male child, family poverty level, public
2 class	.00	.00	58,911	59,003	.84	0	assistance, public housing, teenage mother, maternal education
24 months							
3 class	.00	.00	46,048	46,164	.87	0	Male child, public assistance, maternal
2 class	.00	.00	47,952	48,038	.86	0	education
36 months							
3 class	.00	.00	38,043	38,144	.82	0	Number of children under age 5, teenage
2 class	.00	.00	39,075	39,150	.80	0	mother, food stamps, maternal education

the "right" number of groups is known (e.g., Henson, Reise, & Kim, 2007; Magidson & Vermunt, 2004; Nylund et al., 2007; Tofighi & Enders, 2007; Yang, 2006) also indicate that statistical tests of significance guide selection of the correct number of classes, and that the bootstrap likelihood ratio test (BLRT; McLachlan & Peel, 2000) consistently performs the best. The BLRT compares the estimated model to a model with one class fewer than the estimated model. The p value obtained in the test is an approximation of the probability that the data have been generated by the model with one less class, thus, a low p value indicates that the model with one less class is rejected in favor of the estimated model. The BLRT was used in the present study to determine whether a three-class solution fit the data better than a two-class solution.

The AIC and SSA-BIC values and the BLRT and Lo–Mendell–Rubin LRT p values for the two- and three-class solutions are shown in Table 4. Entropy is also reported but not used to compare models. These results showed that according to the SSA-BIC and the AIC, a model with three latent classes performed best, as this was the solution with the lowest values for both criteria. The BLRT and Lo–Mendell–Rubin LRT yielded highly significant p values for two classes over one, and for three classes over two. Consistent with the AIC and SSA-BIC, the BLRT for four classes over three was nonsignificant; adding a fourth class to the model did not improve fit significantly. Therefore, the three-class model was selected as the most parsimonious description of the EHS data across each of the three time-points. Using this criterion, three latent profiles of mothers were identified at each time point based on parenting behavior and home environment indicators.

3.2. Description of parent profiles

Within each age, the profiles for each class or group were examined in detail. Estimated means and standard errors for each parenting indicator are shown in Figs. 1–3. Within each time point the groups of parents can be described based on the profile of
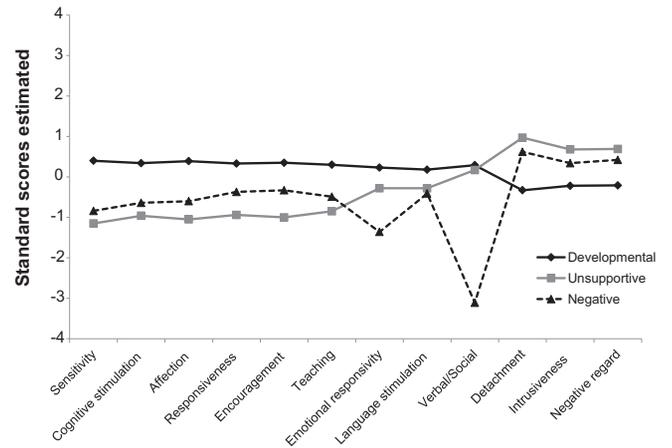

Fig. 2. Parenting profile indicators at child age 24 months.

standardized scores across all the parenting indicators. In each of these figures, the y axis shows the mean of the standard Z-scores for each group so that effect sizes of the differences between groups can be interpreted in terms of the standard deviation.

At all time points, one profile of mothers was labeled "developmental parenting" because of their high scores on parenting considered to be supportive of children's development. This profile is distinguishable as high-scoring on socially supportive, warm, and cognitively stimulating parenting indicators and low-scoring on less supportive and stimulating parenting behaviors. This group scored consistently high on all indicators that are considered positive parenting and that are shown in the research literature to be supportive of children's early development. For example, the
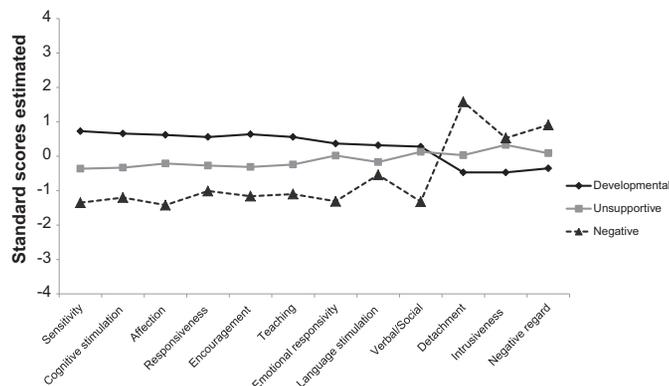

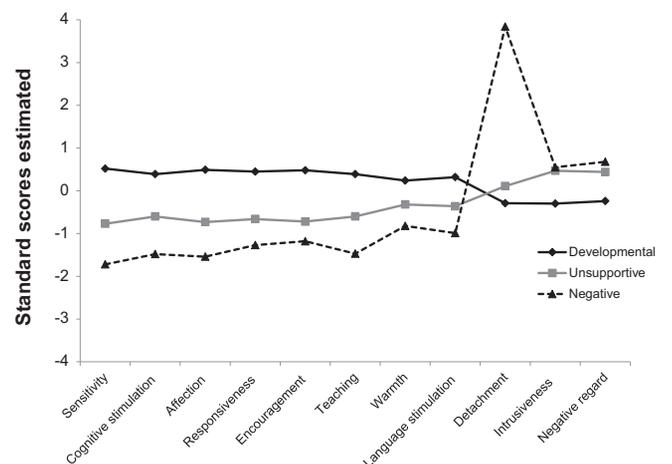**Fig. 1.** Parenting profile indicators at child age 14 months.

Fig. 3. Parenting profile indicators at child age 36 months.

estimated standardized mean for the parent encouragement domain of PICCOLO at 14 months was almost two-thirds of a standard deviation higher in the developmental parenting group than in the overall sample, almost a standard deviation higher than in the second group, and almost two standard deviations higher than the third group, with most of the other parenting behavior indicators following a similar pattern. One of the smaller differences between the developmental and other groups was in the language stimulation subscale of the HOME, which was only about a third of a standard deviation higher than in the overall sample at 14 and 36 months and less than a fifth of a standard deviation higher than the overall sample at 24 months.

The second profile of mothers was labeled "unsupportive parenting" because of their low scores on a variety of parenting behaviors considered to be supportive of children's development. This group scored consistently lower than the developmental parenting group on the socially supportive and cognitively stimulating parenting indicators and scored consistently higher on the less supportive and stimulating parenting behaviors. For example, the estimated standardized mean for parent encouragement at 24 months was a standard deviation lower in the unsupportive parenting group than in the overall sample and one and a third standard deviations lower than the developmental parenting group, a pattern that was similar across most of the other positive parenting behavior indicators. There was only a small difference, however, in verbal–social interaction at 24 months, with the standardized mean being just over a tenth of a standard deviation lower in the unsupportive group compared with the developmental group.

The third profile of mothers was labeled "negative parenting" because of especially low scores on emotional responsivity and verbal–social interaction and especially high scores on emotionally negative behaviors. On most indicators, the negative parenting group was similar to the unsupportive group, but at 14- and 24-months the negative parenting profile was distinguishable from the unsupportive parenting profile by especially low scores on the HOME emotional responsivity and HOME verbal–social interaction subscales, indicate exceptionally low warmth and rare inclusion of the child in conversation and interaction, especially at age 2, that together appear rejecting or negative toward the child's social and emotional needs (Figs. 1 and 2). At 36 months, the negative parenting profile was distinguished from the unsupportive group by scoring consistently lower across most of the positive parenting indicators and especially high on detachment (Fig. 3). For example, a comparison of the estimated standardized means for parent detachment shows that the negative parenting group was four standard deviations higher than the developmental parenting group.

Latent transition analysis (LTA) was conducted as a means of modeling change over time in the latent class membership and transition patterns across parenting classes as these child developed through infancy, toddlerhood, and into preschool. The LTA model describes change in outcomes where the outcomes are latent and are *indicated* by a set of observed variables, in this case, the parenting indicators in Table 2. Estimating LTA models in Mplus allowed for missing data on the measured outcomes (parenting domains) using full information maximum likelihood (FIML) estimation via the expectation maximization (EM) algorithm. Proportions for each class based on estimated posterior probabilities are summarized in Table 5. As shown, transition from one class to another across the three time-points was uncommon, indicating that parenting profiles were stable over time. At 14 months, 58% of the mothers had been classified into the developmental class, and by 36 months, only 6% had transitioned to the unsupportive class and none had transitioned to the negative parenting class. At 14 months, 33% of the mothers were members of the unsupportive class, and by 36 months, 3% had transitioned to the developmental class and 1% to the negative parenting class. At 14 months, negative

Table 5

Proportions of entire sample for changes in latent class based on estimated posterior probabilities.

Profile change	Proportion
Negative at 14 months (1)	
1 1 2	0.00
1 1 3	0.01
1 2 1	0.02
1 2 2	0.00
1 2 3	0.00
1 3 1	0.00
1 3 2	0.01
1 3 3	0.00
Unsupportive at 14 months (2)	
2 1 1	0.00
2 1 2	0.00
2 1 3	0.00
2 2 1	0.00
2 2 3	0.02
2 3 1	0.01
2 3 2	0.05
2 3 3	0.01
Developmental at 14 months (3)	
3 1 1	0.00
3 1 2	0.01
3 1 3	0.03
3 2 1	0.00
3 2 2	0.01
3 2 3	0.11
3 3 1	0.00
3 3 2	0.04

parenting class membership was at approximately 8%, and by 36 months, only 1% had transitioned to the unsupportive class and 1% to the developmental class.

3.3. Characteristics associated with parent profiles

Demographic and psychosocial characteristics were examined in relation to these parenting profiles with logistic regression models, using LCA, to identify those variables that differed across these discrete profiles. Logistic regression results are summarized in Table 6. Only variables that were statistically significant predictors of class membership are shown in the table.

Odds ratios for the 3-class model with covariates, using the developmental profile as the comparison group, indicated that at all ages, mothers with less education were less likely to be in the developmental parenting group, and by 36 months, mothers with fewer children were less likely to be in the developmental parenting group. At 14 and 24 months, mothers of boys were more likely to be classified into the unsupportive group. At 14 months, mothers living below the poverty level were more likely to be classified into the unsupportive group. At all ages, mothers receiving public assistance or food stamps were more likely to be in the negative parenting group. Mothers living in public housing were more likely to in the negative parenting group at 14 months. Mothers who had been under age 20 at the child's birth were more likely to be in the negative parenting group at 14 months and in either the unsupportive or negative parenting groups at 36 months. Ethnicity was examined at each age but was not a statistically significant characteristic associated with any of the parenting profiles, language was highly correlated with ethnicity and therefore was not examined. None of the psycho-social variables reflecting maternal knowledge, attitudes, or mental health differed between the parenting groups.

In summary, the developmental parenting group was characterized by mothers who were more likely to have daughters, more education, more income, less public assistance of any kind, and to be older, but they did not differ in ethnicity or psycho-social characteristics. The unsupportive parenting group was distinguished by mothers more likely to have sons and live in deeper poverty,

Table 6
Logistic regression coefficients and odds ratios for 3-class model using the developmental class as the comparison group.

Effect	Unsupportive				Negative			
	Coefficient	S.E.	Z	Odds ratio	Coefficient	S.E.	Z	Odds ratio
14-Month model			(33.0%)				(8.1%)	
Male child	0.34	.12	2.86**	1.40	0.13	.18	0.71	1.14
Poverty level	0.28	.14	1.98*	1.32	0.34	.20	1.75	1.41
Teenage mother	0.26	.14	1.85	1.29	0.92	.19	4.83**	2.50
Public assistance	0.37	.23	1.57	1.45	1.12	.28	3.98**	3.07
Public housing	0.36	.20	1.74	1.43	0.92	.26	3.52**	2.51
Maternal education	−0.24	.03	−7.42**	0.79	−0.22	.05	−4.64*	0.80
24-Month model			(26.5%)				(7.1%)	
Male child	0.37	.13	2.94**	1.45	−0.09	.18	−0.47	0.92
Public assistance	0.02	.24	0.07	1.02	0.58	.30	1.96*	1.78
Maternal education	−0.27	.03	−8.48**	0.77	−0.28	.04	−6.72**	0.76
36-Month model			(44.3%)				(10.6%)	
# of children under age 5	0.25	.10	2.23*	1.25	0.42	.14	3.07**	1.53
Teenage mother	0.39	.15	2.62**	1.48	0.49	.23	2.15*	1.64
Food stamps	0.19	.14	1.40	1.21	0.58	.20	2.98**	1.79
Maternal education	−0.27	.03	−7.95**	0.77	−0.36	.05	−6.98**	0.70

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

while the negative parenting group was distinguished by mothers more likely to be younger and to receive public assistance of various kinds. The probabilities of group membership ranged from .88 to .99 across all ages and groups.

3.4. Child outcomes associated with parenting profiles

To demonstrate the predictive validity of the parenting profiles, we compared child outcomes at age 3, when the EHS program services were ending, across the parenting LCA classes. The child outcomes included from the 36-month assessment include language vocabulary development, cognitive development, aggression, and positive engagement with parent during play. The relation of parenting class to child outcomes is reflected by the significant differences in means across parenting types in children's cognitive development, vocabulary, and engagement with parent in play. The differences in means were also in the expected direction and approached statistical significance for child aggressive behavior.

As expected, children of developmental parents showed better development in that they had significantly higher scores on the Bayley Mental Development Index measure of cognitive development than children of parents in the other two classes. Children of unsupportive parents showed less positive outcomes in cognitive, language, and social behavior. Children of negative parents show particularly low engagement with the parent during observed play interactions. Children of mothers with the greatest probability of membership in the negative class scored over a standard deviation lower than the sample mean on a measure of social engagement during play. Table 7 shows averaged standardized scores in child outcomes at 36 months across parenting classes.

4. Discussion

In this study, a person-oriented approach was used to examine types of parents, based on parenting behavior, and to explore other characteristics that differ between these types. LCA provides prototypic patterns and this approach provides a way of summarizing the parenting data in terms of the prototypic patterns in the EHS sample and, thus, perhaps low-income parents in general—especially given the stability in membership over time. Substantial heterogeneity along parenting patterns exists in this population of mothers, but three distinct types of parents were identified. The profile of estimated means across multiple parenting indicators suggested labels of developmental parenting, unsupportive parenting, and negative parenting. The developmental parenting group showed

consistently high levels of parental sensitivity, affection, responsiveness, encouragement, teaching, and cognitive stimulation, and low levels of detachment, intrusiveness, and negative regard. These parents also provided high levels of emotional supportiveness, verbal–social support, and language–cognition stimulation in the home for their children. Thus, the parenting behavior observed in this group of parents reflected a pattern that research shows is supportive of children's early development (Kelly et al., 1996; Lee et al., 2002; NICHD Early Child Care Research Network, 1999).

The other two groups of parents showed less support for children's development, but differed from each other in additional ways. The unsupportive parenting group showed lower scores than the developmental parenting group on all positive parenting indicators and higher scores on all negative parenting indicators. The negative parenting group was similar to the unsupportive group but was distinguished primarily by substantially lower scores on emotional responsivity and verbal–social support when children were ages 1 and 2. When children were 3 years old, the negative parenting group showed substantially lower scores on all positive parenting indicators and higher scores on all negative indicators. Thus both the unsupportive and negative parenting groups showed less support for children's development, but the negative parenting group was notable for the mothers' exceptionally poor support for children's early social–emotional development at ages 1 and 2, and by their high negativity by the time the children were 3 years old.

The parent, family, and child characteristics that differed between these groups changed over time with maternal education level being the only consistent predictor across the three age points. Mothers in the developmental parenting group had more education, fewer children, and fewer indicators of poverty, even within this low-income sample. In contrast, the unsupportive parenting group of mothers had less education, more male children, and lower incomes; and the negative parenting group of mothers also had less education and also were more likely to be teenage mothers and to be in public housing and receive public assistance. Thus it is clear that even among families that have incomes below federal poverty guidelines, the degree and nature of the poverty a family experiences does play a role in the type of parenting a child experiences. Although the unsupportive and negative parenting groups are similarly characterized by less education, more children, and more indications of deeper poverty, the negative parenting group, who show the pattern that is likely to provide the worst environment for young children's development, are the youngest mothers who are also the most dependent on various forms of external financial support. Thus, among the two non-developmentally supportive parent

Table 7
Standardized means for child outcomes at 36 months across the three parenting classes.

Class	Cognitive development[***] Standardized mean (S.E.)	English vocabulary[***] Standardized mean (S.E.)	Aggression[+] Standardized mean (S.E.)	Engagement[***] Standardized mean (S.E.)
Developmental	.26 (.04)	.28 (.04)	−.06 (.03)	.55 (.03)
Unsupportive	−.15 (.04)	−.19 (.04)	.01 (.04)	−.38 (.04)
Negative	−.59 (.08)	−.47 (.08)	.14 (.08)	−1.04 (.09)

[+] $p < .10$.
[***] $p < .001$.

groups, the most common risk factors, low maternal education and deep poverty, were more likely to be present, and in the negative parenting class with the worst outcomes for children, these risks accumulated along with younger maternal age and even deeper poverty.

None of the maternal psychosocial characteristics, considered for inclusion in any of the models, distinguished these parent groups beyond the differences accounted for by the demographic characteristics. Although there is considerable evidence that mothers' mental health, knowledge, and attitudes affect their parenting (Eamon & Zuehl, 2001; Murray et al., 1996), these characteristics do not differentiate the discrete parenting groups identified in this study. The factors of poor education and deep poverty are the clear differences between these groups, and the experience of mothers who lack education and face the stress of extreme poverty, especially if they are very young, may overwhelm their abilities to provide developmental support for their children, regardless of their overall mental health or knowledge and attitudes about children's development. The restricted low range across the SES variables for this sample makes the fact that maternal education is associated with parenting noteworthy and indicates that even small differences in education may be important to parenting. It is also important to note that among these ethnically diverse families living in poverty, the largest profile at each age was the developmentally supportive group of parents whose behaviors show they are able to support their children's early development.

The profiles of parenting types shown in this study differed not by distinctive patterns of emphasis, in which for example, some parents might emphasize sensitive nurturing and others provide more stimulation and encouragement, such as would be suggested by theories emphasizing either attachment security or cognitive–language skills (Ainsworth et al., 1978; Bloom, 1984; Bowlby, 1969; Vygotsky, 1978). Instead, we saw patterns of parenting that were distinguished in two ways, as suggested by other theories of parenting. The developmental parenting group in our study was distinguished from the other two groups by a broad pattern of supportive parenting behaviors, consistent with theories set forth by parenting process, development systems, and social capital theories (Bradley & Caldwell, 1995; Bronfenbrenner, 1986; Coleman, 1988; Guralnick, 2011; Sameroff & Fiese, 2000), in which parenting behaviors provide a variety of general experiences that support children's early development. The other two groups were distinguished from the first group by being less supportive, but distinguished from each other by the negativity of their parenting behaviors, as suggested by theories that characterize some parents as negatively controlling of children's behavior and consider the negative effects of harsh parenting on children's development (Baumrind, 1978; Bradley & Caldwell, 1995). The parenting patterns revealed in our analyses also did not show the combinations of nurturance and frustration in the person-oriented results reported for African-American parents (McGroder, 2000). Perhaps because the parenting groups were based on parenting behaviors rather than by parenting goals or motivations, we found no ethnicity differences between the identified parenting groups.

These patterns of parenting do not suggest different styles of parenting, but rather, different levels of parenting competence in supporting children's development and, in the case of parents in the negative parenting group, a different emotional tone of parenting. From the perspective of practitioners who work with parents, the question remains whether different types of parents would benefit from different types of intervention or support. For the parenting profiles we identified, it may make more sense to consider both the intensity and types of services that would be needed to make a difference for parents in each of these groups.

For developmental parents who already engage in positive interactions that are likely to promote children's development, the most appropriate intervention may be encourage them to do more of what they already do and to provide information about what to expect as their children develop and how to handle common behavior problems—the content of many parenting programs. While over half of the parents were in this group, these parents tend to have fewer risk factors and made use of fewer social support services such as referrals for housing or food. Parents who are unsupportive of their children's development, showing lower levels of the kinds of parenting known to support early child development, may need similar services but at a higher level of intensity and support, perhaps by guided coaching in a strengths-based model (e.g., Roggman, Boyce, & Innocenti, 2008; Rush & Shelden, 2011). In addition, these parents live in deeper poverty and may need more social support services. Parents with a profile like the negative parenting group in our study may have more emotional limitations and in addition to intensive encouragement and information may also need additional services to become more engaged in parenting and to show more warmth toward their child, such as through an infant mental health model (Chazan-Cohen, Roderick Stark, Mann, & Fitzgerald, 2007). In addition, because they are younger but likely to be already receiving various kinds of public assistance, parents in the negative parenting group may need more psychological support to pursue education and job training and to cope with the stress that could come with those pursuits.

One strength of this study is the use of unique and high quality data from additional observations of the archived videotaped observations from the EHSREP data set. These observations, in conjunction with the data available in the public use data set, allowed a comprehensive look at parenting behavior at multiple child ages and an exploration of associations with other person and context characteristics. The PICCOLO variables provided highly reliable dimension scores that were valuable for multi-level modeling analyses. Gathering parenting data by means of behavioral observations is a preferred method to parenting self-reports which have been criticized as being parental preference measures rather than measures of actual behaviors (Holden & Edwards, 1989; Zaslow et al., 2006). Another strength of this study is the large sample size. The sample of over 2000 parent–child cases with observed interactions provided the ability to detect subtle links among parenting behaviors and characteristics to identify parenting types. This along with statistical methods to account for missing data provides confidence in the results.

A limitation of this study is that the program children were participating in 17 different Early Head Start programs, and therefore the services provided were not similar across all families. Because there was not a core set of service variables that could be examined, it was not possible to examine the impact of specific parenting support services on each parenting type. This leaves the question of what services work best for which families unanswered. These descriptions of parenting types could provide data for evidence-based practice by testing different types of services for each parenting type.

A second limitation is that these analyses do not causally link parenting to child outcomes. Due to the use of an unconditional model and the likelihood of selection bias, it is not possible to account for all observed differences in child outcomes. Nevertheless, child outcomes differed significantly between the parenting groups, suggesting that parenting profiles are related to later outcomes likely by providing different social and cognitive contexts for early development.

Another limitation is that practitioners in the field cannot easily replicate the results reported here. Practitioners working with low-income parents of infants and toddlers are unlikely to be able to do latent class analysis. They are, however, likely to be able to observe patterns of parenting behaviors relevant to these profiles, either by informal observation or by using an observational measure designed for use by practitioners, such as the PICCOLO developmental parenting measure. The standardized mean scores for the PICCOLO domains across the identified parenting groups suggest that parents who are similar to the parents in the developmental group in this study will similarly score above average on the PICCOLO measure. Parents who score below average on the PICCOLO measure would be similar to the parents in either the unsupportive or negative groups in this study, but further observation of the negative emotional quality of parenting would be necessary for practitioners to differentiate between these other two groups.

This study contributes to the existing research on parenting by examining patterns of parenting behavior at multiple time points. Person-oriented approaches permitted parenting data to be presented in terms that applied to groups of individual parents showing similar patterns and showed how these relatively stable parenting types were distributed and characterized at different ages. Although parents' personality traits, children's behaviors, and other environmental influences also play a role in mothers' parenting behavior (Belsky, 1984; Metsapelto & Pulkkinen, 2003), the present study identifies characteristics of parents and contexts related to distinct types of parenting by mothers in low-income families.

Future research should examine the match of services to types of parents to provide guidance for practitioners working directly with parents, such as home visitors, parent coordinators, and those in similar positions. In the field of early childhood education, a more "wholistic" approach has been recommended in preschool curricula and services, in which different developmental domains are addressed together in activities that support growth in more than one domain at a time (ACEI, 2006; NAEYC, 2000). Perhaps a parallel focus on the "whole" parent could have broader benefits to both parents and children, such as by promoting developmentally supportive parenting more generally, compared with focusing on a single specific aspect of parenting behaviors, such as responsiveness or reading. Answering the question "What are the set of services that benefit each type of parent?" would provide practitioners with the guidance that would allow them to better serve families. When practitioners observe parenting that is similar to the descriptions of developmentally supportive parents provided here, they may be able to encourage increased use of those behaviors; when they see unsupportive parenting, they may be able to

encourage parents to begin to provide more developmental support by expanding their otherwise low levels of sensitivity, stimulation, and encouragement. With negative parents, however, the parents' detachment and negative emotions expressed toward their children may indicate psychological stresses that require mental health support in addition to parenting support.

Child outcomes that differed across types of parenting in this study included the developmental domains of language and cognitive development that have implications for school success. To the extent that these outcomes are responsive to environmental variation, further research could show how specific parenting types provide different social and cognitive contexts for the development of specific child outcomes related to school readiness (Hart & Risley, 1995; NICHD ECCRN, 2002; Sénéchal & Lefevre, 2002). Further studies could address the long-term outcomes of parenting patterns in infancy and also consider the influences of child characteristics and change over time in parenting behavior. Do differences in child outcomes in relation to different types of parenting depend upon the characteristics of the child? Could changes in parenting type over time affect children's developmental outcomes?

This study extends our understanding of parenting in multiple ways. By using observational ratings from multiple measures, it was possible to identify three distinct parenting types in an ethnically diverse group of low-income parents, typical of the population served by infant–toddler programs that aim to improve parenting as one of their program goals. These types differed not in style or emphasis but in the relative amounts of supportiveness and negativity present in the interactions, with the developmental group showing a profile of consistent support for their children's early development, the unsupportive group showing markedly less support, and the negative group showing a pattern of both low support and high negativity. The resulting groups revealed a surprising amount of stability in parenting style across a 2-year period during which children's parenting demands are often changing. In addition, these findings revealed how certain sociodemographic, familial, and related variables differed between these groups. Both the degree of poverty and the nature of poverty appear to make a difference in how well parents are able to support children's early development. The distinct types of parenting identified in this study—developmental, unsupportive, and negative—show remarkable differences in the quality of developmental support available for children living in poverty.

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