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Maternal Personality, Parenting Cognitions and Parenting Practices

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Abstract

A community sample of 262 European American mothers of firstborn 20-month-olds completed a personality inventory and measures of parenting cognitions (knowledge, self-perceptions, and reports about behavior) and was observed in interaction with their children from which measures of parenting practices (language, sensitivity, affection, and play) were independently coded. Factor analyses of the personality inventory replicated extraction of the Five-Factor model of personality (Openness, Neuroticism, Extraversion, Agreeableness, and Conscientiousness). Controlling for sociodemographic characteristics, the five personality factors *qua* variables and in patterns *qua* clusters related differently to diverse parenting cognitions and practices, supporting the multidimensional, modular, and specific nature of parenting. Maternal personality in the normal range, a theoretically important but empirically neglected factor in everyday parenting, has meaning in studies of parenting, child development, and family process.

Personality and Parenting

The idea that personality has a part to play in parenting has been acknowledged formally at least since Sigmund Freud (1916-1917/1966, 1940/1949; see Cohler & Paul, 2002), and a contemporary view derived from personality psychology is that parenting reflects, in part at least, stable personality characteristics (Belsky, 1984; Clark, Kochanska, & Ready, 2000; Kochanska, Clark, & Goldman, 1997). Indeed, modern systemic theoretical formulations of the antecedents of parenting uniformly include personality factors (Bornstein, 2002; Holden, 2009). Bronfenbrenner and Morris (2006) identified three kinds of personological characteristics in their bioecological model of developmental processes, and they contended that parental personality factors constitute person “force characteristics” that most likely influence child development. More specifically, Belsky (1984) asserted three principal social-contextual determinants of parenting, including the parent’s personality and other personal psychological resources, the child’s individual characteristics, and contextual stresses and supports. Of the three, personality was theorized to be the most important because it affects parenting directly and because it shapes other social contextual factors and forces that influence parenting.

The extant literature in personality and parenting has not produced a unified view of how the multiple dimensions of personality relate to the multiple dimensions of parenting, and the literature has also been criticized on several counts. First, the majority of studies that have examined links between personality and parenting have recruited atypical and even psychopathological (e.g., clinically depressed) samples. More work is warranted to evaluate

how variations in personality within the normal range of the majority nonclinical population relate to individual differences in parenting. Moreover, when personality has been evaluated in relation to parenting, a diversity of measures of personality has been employed, and isolated personality constructs have normally been studied in relation to an isolated parenting cognition or practice, cropping a more complete picture of personality-parenting relations (Cole, Barrett, & Zahn-Waxler, 1992; Halverson & Wampler, 1997; Kochanska et al., 1997).

This Study

In this light, the main purposes of the present study were (a) to extend research in personality and parenting in the normal range in a systematic fashion by measuring personality in a standardized way, framing maternal personality in terms of the commonly accepted Five-Factor model in a large sociodemographically heterogeneous nonclinical community sample of mothers of young children and (b) to examine systematically associations between the established Five-Factor structure of personality and a wide array of meaningful age-appropriate parenting cognitions and parenting practices. These cognitions and practices have all been found to relate to child development. Here, we also examine relations between maternal personality factors and parenting cognitions and practices taking into consideration the contributions of maternal age, education, intelligence, and social desirability of responding as well as perceived social competence of the child (see Baumeister, 1999; Caspi, 1998; Winter & Barenbaum, 1999). We take these steps from the perspectives of both “variable” (individual personality factors) and “person” (patterns of personality factors) analyses. Finally, we explore gender differences in relations between maternal personality and parenting cognitions and practices. Prinzie, Stams, Dekovic, Reijntjes, and Belsky (2009) reported that child gender moderates relations between specific personality dimensions and parenting. We consider the current work only a first step and presumptive of future assessments of parental personality’s relations to other features of childrearing and child development in a greater diversity of samples.

To rationalize our twin goals, we first describe the Five-Factor model of personality and the specific parenting cognitions and practices we studied. We then review our specific expectations regarding the roles of each personality factor in each parenting cognition and practice and reasons for studying maternal personality in relation to parenting.

The Five-Factor Model of Personality

Consensus prevails that human personality is best conceptualized as a profile of five broad-band factors each of which has lower-level facets (Costa & McCrae, 1985; John & Srivastava, 1999; McCrae & Costa, 1999; McAdams & Pals, 2006; Pervin & John, 1999). Different researchers have labeled these five factors differently, but the ones that Costa and McCrae (1992) named the “Big Five” have gained in acceptance as a nomothetic trait structure (Digman, 1990). Allik and McCrae (2004) maintained that this structure provides a comprehensive map of personality and may be “universal” in that the same factor structure can be found in individuals in 50 different countries (McCrae et al., 2005).

Openness to Experience (also called Intellect) reflects a tendency to have a broad perspective and to approach life in intelligent, creative, philosophical, and inquisitive ways. *Neuroticism* (Negative Affectivity or Emotional Instability) reflects a proneness to psychological distress, unrealistic ideas, excessive cravings or urges, maladaptive coping responses, and a perturbable, insecure, and vulnerable orientation to life. *Extraversion* reflects the quantity and intensity of interpersonal interaction, activity level, need for stimulation, capacity for joy, control, and assertiveness. *Agreeableness* (Trustworthiness) reflects an interpersonal orientation in feelings, thoughts, and actions along a continuum

from compassion to antagonism, the high end of which is characterized as cooperative, trusting, and warm. *Conscientiousness* reflects the extent to which a person is well organized, responsible, decisive, dependable, hardworking, and even ambitious. The robustness and apparent pervasiveness of the Five-Factor structure led McCrae and Costa (1999) to suggest that psychologists adopt these Five Factors as a basic assessment framework (Fraley & Roberts, 2005; Roberts & DelVecchio, 2000). Different instruments have been utilized to measure the five factors, including the Jackson Personality Inventory (Jackson, 1976; see Ashton, Jackson, Helmes, & Paunonen, 1998; Detwiler & Ramanaiah, 1996; Paunonen & Jackson, 1996), which we used here.

Parenting Cognitions

Parents' cognitions are key constituents of their childrearing and are thought to serve many functions: They generate, organize, and shape, as well as mediate the effectiveness of, parenting practices (see Darling & Steinberg, 1993; Goodnow & Collins, 1990). They also relate to child development directly (Cole et al., 1992; Kochanska et al., 1997). First, we studied mothers' personality in relation to their *knowledge of childrearing and child development*. Parenting knowledge encompasses many domains: approaches appropriate to fulfilling the biological and physical as well as socioemotional and cognitive needs of children as they develop; normative child development, that is the abilities and accomplishments of children as they grow; and strategies for maintaining and promoting children's health and coping effectively with children's illness (Bornstein, 2006a). More knowledgeable parents harbor more realistic expectations of themselves and their children, and they are more likely to behave in developmentally appropriate ways with their children (Bornstein, Hendricks, et al., 2003; Bugental & Happaney, 2002; Grusec & Goodnow, 1994). Mothers' parenting knowledge relates to their parenting practices (Conrad, Gross, Fogg, & Ruchala, 1992; Damast, Tamis-LeMonda, & Bornstein, 1996) and to their children's development (Benasich & Brooks-Gunn, 1996; Hunt & Paraskevopoulos, 1980).

Second, we studied *self-perceptions of parenting*, in particular mothers' feelings of competence in their role as caregiver, investment in childrearing, and satisfaction gained from parenting. Self-efficacy theory posits that adults who evaluate themselves as competent, who know what they can do, and who understand the likely effects of their actions will, as parents, more likely act as constructive partners in their children's development (Bandura, 1997; Coleman & Karraker, 1998). Mothers' cognitions about their own parenting competence are associated with their use of more effective childrearing strategies (Teti & Candelaria, 2002).

Last among cognitions, we studied mothers' *reports of their actual parenting behaviors* with their children in domains of dyadic interaction and extradyadic exchange. Dyadic interactions consist of behaviors parents use to engage their children in affective interpersonal transactions (Bornstein, 1989, 2002; Stern, 1985). Extradyadic exchanges engage children's attention to objects, properties, or events in the environment (Bornstein, 1989, 2002; Papoušek & Bornstein, 1992). Mother dyadic and extradyadic interactions are each developmentally significant because they relate to children's social, emotional, communicative, and cognitive competencies (Clarke-Stewart, 1973; Smith, Adamson, & Bakeman, 1988).

Parenting Practices

Parents' practices are the tangible everyday childrearing behaviors parents engage in when with their children. We investigated several maternal practices. First, *language* is the "invisible work" of parenting and is a principal means of child instruction and scaffolding as well as a vital ingredient of social interaction, socialization, and the parent-child bond.

Language addressed to children plays a supportive role in virtually all domains of their development (Hart & Risley, 1995; Saarni, Campos, Camras, & Witherington, 2006).

Second, *sensitivity* refers to the affective quality of emotional relationships between parents and their children and focuses on a mother's accessibility to the child and ability to read and respond to her child's communications (Ainsworth, Blehar, Waters, & Walls, 1978; Biringen, 2009). Sensitivity is a primary means through which caregiving quality is expressed (Zhou et al., 2002), and sensitivity relates to quality of attachment as well as other aspects of the parent-child relationship and child development (DeWolff & van IJendoorn, 1997).

Third, *expressions of affection* consist of behaviors that plainly convey love and tenderness to the child. Parents overtly express warmth and acceptance to their children through their manifest expressions of affection in terms of behaviors directed to amuse the child, express warmth and approval, and convey love and affirmation.

Last among practices, we studied *play*, a common interactive social-cognitive situation. At play, parents provide children with diverse and pleasant experiences that cultivate and rehearse abilities that promote children's adaptation to and coping with the physical and social world (Bornstein, 2006b).

Expectations Regarding the Roles of Personality in Parenting

Insofar as the Five Factors of personality describe stable and decontextualized beliefs and behaviors and influence interpersonal relationships (Ozer & Benet-Martínez, 2006), we expected parental personality to influence parenting cognitions and practices. Guided by the extant literature, we hypothesized specific associations between each of the five personality factors in mothers and selected parenting cognitions and practices.

Openness was expected to have the most positive associations with parenting. Openness has been positively related to positive features of parenting: Losoya, Callor, Rowe, and Goldsmith (1997; see also Metsäpelto & Pulkkinen, 2003) found that Openness was associated with more nurturance and support and less negative control. We expected more open mothers to possess more parenting knowledge, to feel more competent and invested in their parenting, to report engaging in more dyadic and extradyadic interactions, and to play in more sophisticated ways.

Studies of neuroticism in nonclinical samples have generally found that higher levels of maternal neuroticism are related to lower levels of warmth, involvement, responsiveness, and sensitivity and higher levels of intrusiveness, irritability, criticism, negative discipline, hostility, and power assertion (Bögels & Van Melick, 2004; Clark et al., 2000; Kashdan et al., 2004; Kochanska, Aksan, & Nichols, 2003; Kochanska et al., 1997; Losoya et al., 1997; Metsäpelto & Pulkkinen, 2003; Woodruff-Borden, Morrow, Bourland, & Cambron, 2002). That said, Neuroticism is multifaceted, and one facet is identifying closely with others, valuing emotional ties with others, and being concerned about others (interpersonal affect). This facet of Neuroticism could potentially manifest itself in sensitive parenting and account for studies that have failed to unearth negative associations between neuroticism and parenting (Ginsburg, Grover, & Ialongo, 2004; Smith et al., 2007; Turner, Beidel, Roberson-Nay, & Tervo, 2003). We expected more neurotic mothers to feel less competent and less satisfied with their parenting, but also to be more invested and to shower their children with more affection.

Extraversion was expected to exert opposing influences on parenting (Roberts, Walton, & Viechtbauer, 2006) because there are two facets to extraversion as well, namely, social

dominance and social vitality. Extraversion *qua* social vitality might express itself in being sensitive to, affectionate toward, speaking with, and stimulating the child more (Belsky & Barends, 2002). Mangelsdorf, Gunnar, Kestenbaum, Lang, and Andreas (1990) and Belsky, Crnic, and Woodworth (1995) reported that mothers who were more Extraverted were more sensitive and cognitively stimulating toward their children. On this view, we expected that Extraverted mothers would engage more in interactions with their children. Extraversion *qua* social dominance might express itself in the desire to engage in activities that compete with the parenting role. Kochanska (et al., 2007; Clark et al., 2000) reported that higher levels of Extraversion are related to more maternal power assertion, and Smith (2010) found Extraversion related to maternal control. On this view, we expected that for Extraverted mothers competing activities might undermine parenting so that they feel less competent and satisfied and show their children less physical affection.

Agreeableness reflects an interpersonal orientation along a continuum from compassion to antagonism in feelings, thoughts, and actions. Agreeableness is positively related to cognitive stimulation and responsiveness, sensitivity and warmth, and supportive and nurturing parenting and negatively related to detachment and power assertion (Clark et al., 2000; Kochanska et al., 1997; Smith et al., 2007). We expected more agreeable mothers to be more satisfied with their parenting and more sensitive and affectionate with their children.

Conscientious parents are supportive, responsive, sensitive, and observant and set limits but are not power assertive and negatively controlling (Clark et al., 2000; Kochanska, Friesenborg, Lange, & Martel, 2004; Losoya et al., 1997; Smith et al., 2007). However attractive high conscientiousness may appear, extreme parental levels of Conscientiousness may place too many demands on young children (Belsky & Barends, 2002), and thus Conscientiousness could be linked with intrusive or over-controlling behaviors. So, conscientiousness might relate to parenting in complex ways. We expected more conscientious mothers to know more about childrearing and child development, to think of themselves as more competent at parenting, to report being more engaged with their children, and to show greater sensitivity.

Reasons for Studying Mothers' Personality in Relation to Parenting

We studied parenting personality, cognitions, and practices in mothers. Research on parenting attitudes and activities has almost exclusively concentrated on mothers, recognizing that they traditionally and across cultures assume primary -- if not exclusive -- responsibility for early childcare, that they participate in childrearing activities at significantly higher rates than do fathers or alloparents, and that, beginning prenatally, mothering is unequivocally principal for the health and development of infants and young children (Barnard & Solchany, 2002; Leiderman, Tulkin, & Rosenfeld, 1977; Parke, 2002; Weisner & Gallimore, 1977). Given societal dictates that it is mothers who are ultimately responsible for their young children's lives and health, women have traditionally become more "expert" caregivers than men (Stern, 1985). Not unexpectedly, it is also maternal parenting that is most consistently associated with developmental and health outcomes in children (Crouter, Helms-Erickson, Updegraff, & McHale, 1999; Maccoby & Martin, 1983; Parke, 2002).

Methods

Participants

Altogether, 262 European American mothers of firstborn, healthy 20-month-old children participated. Families were recruited throughout the mid-Atlantic eastern seaboard through

mass mailings and newspaper advertisements. Mothers who responded were screened according to study criteria (primiparous European Americans with a normal pregnancy and a healthy infant) and were accepted into the study on a first-volunteer—first-admitted basis. Mothers averaged 31.16 years of age ($SD = 6.36$, $range = 15.13-47.26$) at the time of the study. In terms of education, 9% of mothers had not completed high school, 11% were high school graduates, 20% completed specialized training or partial college, 30% completed a standard 4-year college degree, and 30% started or completed a graduate or professional degree. At the time of the study, 63% ($n = 165$) of mothers were employed outside the home, and those who were employed worked on average 32.69 hours weekly ($SD = 13.01$). Ninety-one percent ($n = 238$) were married, 8% single, and 1% separated or divorced. Family socioeconomic status (SES; Hollingshead, 1975, Four-Factor Index of Social Status; see also Bornstein, Hahn, Suwalsky, & Haynes, 2003) varied across nearly the full range, $M = 49.66$ ($SD = 13.30$, $range = 14 - 66$). Thus, our community sample was sociodemographically heterogeneous, but we recruited an ethnically homogenous sample as a first step in understanding the matrix of associations surrounding maternal personality because mothers of different ethnic and cultural groups may possess different compositions of personality characteristics and parent differently (Allik & McCrae, 2004; Bornstein, 1991, 2001; Bornstein et al., 2007). Approximately 75% of the population of the United States self-identifies as European American (Tilton-Weaver & Kakihara, 2008; U.S. Census Bureau Population Division, 2004). By including only European American mothers, we intentionally avoided an ethnicity confound that has plagued the existing literature and would cloud our findings with respect to personality-parenting relations.

Children averaged 20.09 months of age ($SD = .22$, $range = 19.45 - 20.93$) at the time of the study, and the sample was balanced for child gender (46% girls, $n = 121$). At birth, more than 97% of the children were term and of normal weight; none of the mothers of preterm or postterm children emerged as a univariate outlier or influential case, and so all were retained in analyses. We studied personality and parenting cognitions and practices in mothers with children in their second year because we wanted information from mothers who were settled in the maternal role and whose parenting had had time to stabilize.

Procedures

Mothers and their children were observed in the home by a female experimenter who conducted the following procedures: An inventory of sociodemographic information about the family, a mother-child play session, and experimenter and mother visit evaluations. Mothers also completed questionnaires. Later by telephone interview each mother completed a measure of her child's social competence.

Maternal Personality

The Jackson Personality Inventory (JPI; Jackson, 1976) was self-administered (220 *true-false* questions). Nine scales functionally relevant to interactions of mothers and young children included Breadth of Interest, Innovation, Conformity, Anxiety, Interpersonal Affect, Social Participation, Self-Esteem, Responsibility, and Organization. Table 1 presents descriptive statistics of scale scores. All mean standard scores fell within 1 SD of means reported in a standardized sample of 2,000 U.S. adult females (Jackson, 1976). Empirical evaluations of the JPI have confirmed its satisfactory validity and reliability (Jackson, 1976).

Paunonen and Jackson (1996) used Procrustes rotation on 5 principal components of 12 JPI scales in 10 samples ($Ns = 86$ to 740) and found the absolute values of the mean loadings across samples ranged from .60 to .90 on five factors that they interpreted as corresponding to the Five-Factor Model of personality (Ashton et al., 1998; Detwiler & Ramanaiah, 1996).

Our *a priori* model is the Pauonen and Jackson model modified to allow correlations among the Big Five factors reflecting assumptions in the literature (John & Srivastava, 1999). The Openness dimension in the current Five-Factor Model consisted of Breadth of Interest and Innovation. Neuroticism consisted of the Anxiety, Conformity, and Interpersonal Affect. Extraversion consisted of the Social Participation and Self-Esteem. Agreeableness and Conscientiousness in the current model consisted of the Responsibility and Organization, respectively. Openness was modeled to covary only with Extraversion; Neuroticism to covary with Extraversion, Agreeableness, and Conscientiousness; Extraversion to covary with Conscientiousness, Neuroticism, and Openness; Agreeableness to covary with Conscientiousness and Neuroticism; and Conscientiousness to covary with Extraversion, Agreeableness, and Neuroticism. Confirmatory factor analysis models were fit using maximum likelihood functions and followed the mathematical models of Bentler and Weeks (1980) as implemented in EQS 6.1 (Bentler, 1995; Bentler & Wu, 1995). This hypothesized *a priori* model did not fit the data: $\chi^2(25) = 181.35, p < .001$, robust CFI = 1.00, RMSEA = .16, 90% CI = (.13, .18). Potential additional paths and error covariances were identified by inspecting the standardized residual matrix, the univariate and multivariate Lagrange Multiplier tests, the expected parameter change, and chi-square statistics for improvement in fit. Figure 1 presents the standardized solution to the final model, $\chi^2(22) = 52.48, p < .001$, CFI = 1.00, RMSEA = .07, 90% CI = (.048, .098). In accord with Doster et al. (2000) on the factor structure of the Jackson Personality Inventory-Revised which showed cross-loadings of subscales on factors, we identified two cross-loadings during the model re-specification process. The Five Factors also hold for mothers of girls and mothers of boys and independent of maternal age and education (details available from the first author). The generalized least squares estimates of the Five Factors (as implemented in EQS and depicted in Figure 1) were computed and used in analyses.

Maternal Parenting Cognitions

Parenting knowledge—The *Knowledge of Infant Development Inventory* (KIDI; MacPhee, 1981; see also Miller, 1988) assesses knowledge of parenting practices, developmental processes, health and safety guidelines, and norms and milestones relevant to children from birth to 2 years of age. To estimate respondents' parenting knowledge adjusted for differences in item difficulty and discrimination, KIDI items were evaluated under Item Response Theory (IRT; Baker & Kim, 2004) for the fit of a 2-parameter logistic (2-pl) regression model using marginal maximum likelihood estimation (Baker & Kim, 2004; Thissen, Steinberg, & Waine, 1993). We accumulated responses to the KIDI from 1,384 mothers of infants from 5 to 24 months of age in 27 heterogeneous groups from 12 countries. Sixty-one items were eliminated because resulting difficulty parameter estimates were < -2 or $> +2$ (on a standard normal scale with $M = 0$ and $SD = 1$) or their discrimination parameters were < 0.3 or $> +2$ (Embretson & Reise, 2000; Hambleton, Swaminathan, & Rogers, 1991) or because they showed differential item functioning (DIF; Thissen, et al., 1993) in the 443 U.S. mothers compared to the 941 mothers who were immigrants or citizens of other countries. Given 1,384 mothers' responses to the 14 non-DIF items and the parameter estimates obtained in the calibration data for the discrimination and difficulty of the items, maximum likelihood estimates of parenting knowledge for mothers in this study were computed and used in analyses.

Self-perceptions—The *Self-Perceptions of the Parental Role* instrument (SPPR; MacPhee, Benson, & Bullock, 1986) contains 16 items representing three scales that assess: Competence (6 items), Investment (5 items), and Satisfaction (5 items). Each item has a pair of statements that describe contrasting endpoints of the dimension in question, thereby minimizing socially desirable responses. For example, one of the items states: "Some parents do a lot of reading about how to be a good parent. BUT Other parents don't spend

much time reading about parenting.” The respondent chooses the statement that describes her best and then checks *Sort of true for me* or *Really true for me*. There are four response items, weighted 1, 2, 4, and 5 to accord with the absence of a response indicating that the item was equally like and unlike the respondent. Scores for each scale were the unweighted mean of responses to scale items. SPPR scales have demonstrated internal reliability, construct validity, and test-retest reliability (MacPhee et al., 1986; Seybold, Fritz, & MacPhee, 1991). In the current sample, as for Competence, Investment, and Satisfaction, respectively, were .73, .74, and .76.

Style—The *Parental Style Questionnaire* (PSQ; Bornstein et al., 1996) consists of 14 randomly ordered items to assess how often parents report that they engage their children in two domains: dyadic interaction (sensitivity, expressions of affection, and positive responsiveness to the child; 5 items) and extradyadic exchange (stimulating and organizing an environment conducive to exploration and learning; 9 items). The PSQ uses a Likert-type rating scale ranging from 1 = *Hardly at all* to 5 = *All the time*. Scores for each domain were the unweighted mean of responses to the items comprising the domain. The as for mothers’ ratings of their reported dyadic interaction and extradyadic exchange were .61 and .59, respectively.

Maternal Parenting Practices

Maternal practices were recorded in the course of 10 min of naturalistic mother-child free play during the home visit. Play followed a conventional period of acclimation (McCune-Nicolich & Fenson, 1984; Stevenson, Leavitt, Roach, Chapman, & Miller, 1986) and used a set of standard, age-appropriate toys. Data obtained from sessions that were shorter than 510 sec were omitted. If the session lasted less than 600 sec but more than 510 sec, as it did for 14 mothers (5% of the sample; *range* = 521 - 590 sec), measures obtained from the session were prorated up to 600 sec. Mother and experimenter evaluations of the visit were used descriptively to assess whether observed practices were representative of usual parenting and as a check against threats to validity. On 8-point (*range* = 0 to 7) graphic rating scales, mothers rated themselves as having engaged in typical behavior ($M = 5.65$, $SD = 1.34$) and as being comfortable in front of the camera ($M = 5.22$, $SD = 1.63$). The experimenter also rated mothers as appearing relaxed during the observation ($M = 5.54$, $SD = 1.43$). Play sessions were coded to obtain independent measures for the following variables.

Language—Records of the session were transcribed verbatim by professional transcribers naive to all factors in the study. Following the conventions of the Codes for the Human Analysis of Transcripts (CHAT), transcripts were then coded using the MOR and POST procedures within the Computerized Language Analysis (CLAN) program (MacWhinney, 2000). Two measures of maternal speech to child were calculated: (a) mean length of utterance (complexity of speech assessed using MLU based on a count of morphemes in complete and intelligible utterances) and (b) different word roots (vocabulary mothers used indexed by the total number of different word roots they produced, that is a count of the number of different lexical items ignoring inflections). A summary score for each mother’s language to her child was computed as the mean standard score of the two measures ($r = .56$ between measures).

Emotional relationships—The *Emotional Availability Scales* (EA Scales 3rd ed.; Biringen, Robinson, & Emde, 1998) was used to independently assess maternal Sensitivity through observations and ratings of parent-child interaction. Sensitivity refers to the mother’s global expression of warmth and emotional connectedness with her child and is coded as qualities such as responsiveness, accurate reading of cues, efforts to sooth when the child is distressed, and appropriate and authentic positive affect. Sensitivity is evaluated on a

9-point scale ranging from (1) *highly insensitive* to (9) *highly sensitive*. In accordance with the recommendations of Shrout and Fleiss (1979), intercoder reliability was assessed using an average absolute agreement intraclass correlation coefficient (*ICC*) in a two-way random-effects model (McGraw & Wong, 1996). Thirty-one randomly selected records (12% of the sample) were double coded, and coders' agreement was .90.

Expressions of affection—Mothers' interactions with their children were independently coded for three types of expression of affection: (a) social play (physical and/or verbal behaviors directed toward the child to amuse the child), (b) praise/endearaments (verbal expressions of warmth and approval), and (c) physical affection (tactile behaviors that convey love and tenderness). Social play, praise/endearaments, and physical affection were measured as frequency counts. About 18% of the sample was double coded for reliability: *ICC* for social play was .86, for praise/endearaments .93, and for physical affection .66.

Demonstrations and solicitations of exploratory and symbolic play—Mothers' exploratory and symbolic play with their children were independently coded in accordance with a mutually exclusive and exhaustive play category system that included four levels each of exploratory and symbolic play (Bornstein, 2006b). Mothers may initiate exploratory or symbolic play through demonstrations or solicitations. In demonstrating, a mother provides her child with information about how to engage in particular activities by modeling the action (e.g., pretending to feed a doll). In soliciting, a mother places the onus for play on the child by verbally encouraging (but not modeling) the child's participation in specific play activities. Demonstrations of each level of exploratory and symbolic play were calculated separately as the mean of the standard scores of four measures: frequency and duration of each level and proportion of all bouts and of total time at each level. Solicitations of each level of exploratory and symbolic play were calculated separately as the mean of the standard scores for two measures: frequency and proportion of all bouts at each level. For maternal demonstrations, ~17% of the sample was double coded for reliability; and for maternal solicitations, ~20% of the sample. Reliability of play bouts which were demonstrations of symbolic play was based on whether coders agreed on the play level coded in each sec. Average κ s (Cohen, 1960) for maternal demonstrations of exploratory and symbolic play were .76 and .79, respectively. Because solicitations of symbolic play occur within a verbal bout, but are not necessarily equal in duration to that of the verbal bout, their durations could not be calculated, and reliability was calculated as an *ICC* (two-way random, absolute agreement, average of raters). The average *ICCs* for maternal solicitations of exploratory and symbolic play were .95 and .92, respectively.

Covariates

To isolate associations between personality and parenting, potential covariates included maternal age, education, verbal intelligence, and social desirability of responding, as well as maternal perceptions of child sociability. Prinzie et al. (2009) identified such factors as potential moderators of relations between specific personality dimensions and parenting. Mothers were administered the Peabody Picture Vocabulary Test-Revised (PPVT-R Form L; Dunn & Dunn, 1981). The PPVT-R is a measure of receptive language ability that is highly correlated with intelligence. Up to 175 vocabulary words were presented verbally by a trained experimenter, and for each word presented the mother chose one of four pictures to indicate the meaning of the word. Standard scores with a possible range of 40 to 160 ($M = 100$, $SD = 15$) were obtained based on maternal age. The median split-half reliability coefficient for 828 adults ranging from 19 to 40 years was .82. Age-normed standard scores ($M = 100$, $SD = 15$) were used.

Self-report potentially suffers from social desirability (Gosling, John, Craik, & Robins, 1998). The 33-item *Social Desirability Scale* (SDS; Crowne & Marlowe, 1960) was used to assess mothers' tendency to respond to questions in a socially desirable fashion. Crowne and Marlowe (1960) reported that test-retest reliability for the SDS was .89. We assessed correlations of SDS with maternal self-reports of SPPR, PSQ, and child social competence. Adjusted scores controlling for SDS were computed for scale scores that showed significant ($p < .05$) and meaningful (share $\geq 5\%$ of the variance) correlations with SDS. The 5% rule was adopted because we were only interested in controlling for SDS when it was conceptually compelling as well as practically meaningful.

Mothers' perceptions of their children's sociability were assessed using the Socialization Domain of the Vineland Adaptive Behavior Scales: The Interview Edition (VABS; Sparrow, Balla, & Cicchetti, 1984). The standard score of the scale was used; it includes up to 40 items applicable to young children and consists of the subdomains interpersonal relationships, play skills, and coping skills. Internal consistency for the VABS is good as is test-retest reliability ($rs = .77$ and $.99$ in $n = 80$ in intervals from 2 to 4 weeks; Balboni & Pedrabissi, 2003; Tombokan-Runtukahu & Nitko, 1992). Validity of the VABS is well supported (Sparrow & Cicchetti, 1978; Tombokan-Runtukahu & Nitko, 1992).

Results

Preliminary Analyses and Analytic Plan

Preliminary analyses—Prior to data analysis, univariate distributions of the maternal personality, cognition, and practice variables were examined for normalcy and outliers; influential cases were evaluated by scatter plots and numeric statistics -- the studentized deleted residual, leverage, and Cook's D (Fox 1997; Tabachnick & Fidell, 2001). Some mothers did not complete all the parenting cognition questionnaires ($n = 10$) or were not interviewed for child social competence ($n = 27$), but their data were missing completely at random, Little's MCAR test: $\chi^2(324) = 356.67$, $p = .10$. We imputed 0.48% of the total data points using the Expectation-Maximization algorithm (Dempster, Laird, & Rubin, 1977). EA Sensitivity and the frequencies of social play, praise/endorsements, and physical affection were not normally distributed. Therefore, when examining relations between maternal personality and these four parenting practices, Spearman's ρ was used. To remove the effect of maternal social desirability bias on self-perceptions of parenting competence, $r(260) = .25$, $p < .001$, an adjusted score was calculated by adding the mean score to the residual from the linear regression of competence on SDS, and it was used in all analyses. Table 1 also presents descriptive statistics of parenting cognitions, practices, and potential covariates for all participants.

Maternal perceptions of child sociability did not relate meaningfully to any parenting cognition or practice (shared variances ranged from 0.0% to 4.2%); it was therefore excluded as a covariate. Significant correlations between maternal age, education, and estimated verbal intelligence with maternal personality and parenting cognitions and practices are reported below. Maternal age, education, and verbal intelligence correlated with Openness, $rs(260) = .34$, $.30$, and $.34$, respectively, $ps < .001$, and Extraversion, $rs(260) = .17$, $.15$, and $.15$, $ps < .01$, $.05$, and $.05$, respectively. Maternal education correlated with Conscientiousness, $r(260) = .13$, $p < .05$. Maternal age, education, and verbal intelligence correlated with parenting knowledge, $rs(260) = .51$, $.53$, and $.42$, respectively, $ps < .001$, self-reported satisfaction in parenting, $rs(260) = .38$, $.37$, and $.24$, respectively, $ps < .001$, reports of extradyadic exchanges, $rs(260) = .27$, $.23$, and $.15$, $ps < .001$, $.001$, and $.05$, respectively, language, $rs(260) = .37$, $.40$, and $.37$, respectively, $ps < .001$, displays of physical affection, $ps = .19$, $.26$, and $.19$, $ps < .01$, $.001$, and $.01$, respectively, and demonstrations of exploratory play, $rs(260) = -.17$, $-.19$, and $-.19$, respectively, $ps < .01$.

Maternal age and education correlated with verbal praise, $ps = .16$ and $.16$, respectively, $ps < .05$.

Analytic plan—Relations of maternal personality with parenting cognitions and practices are reported in separate sections from a “variable” approach and from a “person” approach. The dominant approach to assessment in developmental science uses single variables, or combinations of variables, as the main conceptual and analytical units (Hartmann, Pelzel, & Abbott, 2011). In this variable approach to analysis, a single datum for an individual derives psychological meaning from its position relative to the data from other individuals on the same dimension. However, configurations of individual variables also have meaning and afford information beyond individual variables. The complementary person approach to analysis identifies patterns among elements and reflects a holistic-interactionistic perspective (Magnusson & Allen, 1983). Here, we use the term variable to describe the statistical cum conceptual approach to analysis of personality scales and the term person to describe the holistic approach to the analysis of patterns of personality scales. We analyze and compare personality in terms of variables through the use of individual scales and in terms of persons through the application of an analytic procedure that groups variables into clusters that show coherent constellations.

For each approach, we first evaluated partial correlations between the Five Factors of personality with parenting cognitions and practices controlling for age, education, and estimated verbal intelligence to assess unique associations between the Five Factors of maternal personality and parenting cognitions and practices. Before performing correlational analyses, we examined bivariate scatter plots with lowess smoothers at .60 tension between each maternal personality factor and all cognitions and practices to check for linear or non-linear relations. Six non-linear relations (4 in the variable approach, 2 in the person approach) emerged (see below). Next, we evaluated whether correlations between personality and parenting cognitions and practices were moderated by child gender (for variable analysis) or maternal personality clusters (for person analysis). For all correlations that were significant in either of the subgroups, tests of differences were performed using Fisher’s transformed z . For correlations, $r \approx .10$ is interpreted as a small effect, $r \approx .25$ as a medium effect, and $r \approx .40$ as a large effect (Cohen, 1988).

Maternal Personality and Parenting Cognitions: Variable Analysis

Personality-cognitions—Table 2 presents 28 partial correlations between the five maternal personality factors and parenting cognitions controlling for maternal age, education, and verbal intelligence. Partial correlations ranged from small to medium, 35.7% were significant, and they showed selective relations. Openness positively related to all parenting cognitions measured in this study with the exception of reported satisfaction and dyadic interaction in parenting: Mothers who rated themselves as more rational, creative, and imaginative were more knowledgeable about childrearing and child development, evaluated themselves as more competent and invested in their parenting, and reported that they more often engaged in extradyadic exchanges with their children. Other personality-cognition associations were specific and equally interpretable. Neuroticism related negatively to parent-reported competence and satisfaction: Mothers who rated themselves as more anxious and insecure evaluated themselves as being less competent and satisfied in their parenting. Extraversion positively related to reported parenting competence, dyadic interaction, and extradyadic exchange: Mothers who rated themselves as more outgoing, energetic, and active evaluated themselves as being more competent parents and reported that they more often engaged in dyadic interactions and extradyadic exchanges with their children. Agreeableness did not relate to any parenting cognitions measured in this study. Conscientiousness related positively to reported extradyadic exchange: Mothers who rated

themselves as more organized, responsible, and dependable reported that they more often engaged in extradyadic exchanges with their children.

Two non-linear relations also emerged between personality and parenting cognitions. Figure 2 shows the bivariate scatter plot of Neuroticism and investment in parenting; both variables had been residualized for maternal age, education, and verbal intelligence. The plot suggests a positive relation between the two variables when Neuroticism scores are less than around -1, no relation when Neuroticism scores fall between -1 and 1, and then a positive relation again when Neuroticism scores are greater than ~ 1. We performed nonlinear least squares regression (Marsh & Cormier, 2002) to estimate the locations of spline knots (when the slopes changed). The first spline knot was estimated at an average Neuroticism score of -1.17, $SE = 0.41$, 95% CI = (-1.98, -0.35), and the second spline knot was estimated at an average Neuroticism score of 0.73, $SE = 0.72$, 95% CI = (-0.69, 2.14). The Neuroticism factor scores were distributed with $M = 0$ and $SD = 1.29$; on the basis of visual inspection of the plots, and because the 95% CI of the estimated knot locations included -1.29 and 1.29 for the first and second spline knots, respectively, we used -1.29 and 1.29 as the two knots for piecewise linear regression. The model for the relation of Neuroticism and investment in parenting indicated that for mothers with Neuroticism scores ≤ -1.29 , the relation was positive (standardized slope = .63). For mothers with Neuroticism scores > -1.29 and ≤ 1.29 the relation was negative (standardized slope = -.06), and the decrease in the slope of the regression line before and after the first knot was significant, $F(1, 258) = 4.53$, $p < .05$. For mothers with Neuroticism scores > 1.29 the relation was again positive (standardized slope = .13), and the increase in the slope of the regression line before and after 1.29 was significant, $F(1, 258) = 4.47$, $p < .05$.

Figure 3 shows the bivariate scatter plot of Conscientiousness and parenting knowledge; both variables were residualized for maternal age, education, and verbal intelligence. The plot suggests a negative relation between the two variables when Conscientiousness scores < -1 , and no relation when Conscientiousness scores > -1 . The spline knot was estimated at an average Conscientiousness score of -1.35, $SE = 0.34$, 95% CI = (-2.02, -0.69). Conscientiousness factor scores were distributed with $M = 0$ and $SD = 1$; on the basis of visual inspection of the plots, and because the 95% CI of the estimated knot location included -1, we used -1 as the knot for the piecewise linear regression. The model for the relation of Conscientiousness and parenting knowledge indicated that for mothers with Conscientiousness scores ≤ -1 , the relation was negative (standardized slope = -.49). For mothers with Conscientiousness scores > 1 the relation was positive (standardized slope = .10), and the increase in the slope of the regression line before and after 1 was significant, $F(1, 259) = 7.52$, $p < .01$.

Child gender—Partial correlations between maternal personality and parenting cognitions, controlling for maternal age, education, and verbal intelligence, did not differ between mothers of daughters and mothers of sons, except: Neuroticism correlated negatively with parenting knowledge and reported extradyadic exchange in mother-daughter dyads, $r_s(116) = -.22$, $p < .05$, and $-.24$, $p = .01$, respectively, whereas no relations obtained in mother-son dyads, $r_s(136) = .04$ and $.03$, *ns*, respectively; Fisher's transformed $z_s = 2.11$ and 2.10 , $p_s < .05$. Mothers with daughters who rated themselves as more anxious and insecure were less knowledgeable about childrearing and child development and reported that they less often engaged in extradyadic exchanges with their daughters, but no such relations existed for mothers with sons.

Maternal Personality and Parenting Practices: Variable Analysis

Personality-practices—Table 3 shows 43 partial correlations between the five maternal personality factors and parenting practices controlling for maternal age, education, and verbal intelligence. Partial correlations ranged from small to medium, 7% were significant, and they showed selective relations. Openness and Extraversion related to demonstrations of symbolic play: Mothers who rated themselves as more rational, creative, and imaginative and mothers who rated themselves as more outgoing, energetic, and active in interacting with others demonstrated more symbolic play with their children. Agreeableness related to language: Mothers who rated themselves as more sympathetic, cooperative, and considerate spoke in a longer MLU and used more different word roots in speech to their children. Neuroticism did not relate to any parenting practices controlling for maternal age, education, and verbal intelligence.

Two non-linear relations also emerged between personality and parenting practices. Figure 4 shows the curvilinear relations between Conscientiousness and mothers' demonstrations of exploratory play; both variables had been residualized for maternal age, education, and verbal intelligence. A significant cubic relation was found between Conscientiousness and demonstrations of exploratory play, adjusted $R^2_{\text{cubic}} = .034$, $F(3, 257) = 4.06$, $p < .01$, adjusted $R^2_{\text{increase}} = .023$, $F(1, 257) = 7.26$, $p < .01$. The graph indicates that, as Conscientiousness increases to -0.84 demonstrations of exploratory play decrease reaching a relative minimum of -0.04, demonstrations of exploratory play then increase as Conscientiousness increases to 0.97 at which point demonstrations of exploratory play reach a relative maximum of 0.11; after this point, as Conscientiousness increases demonstrations of exploratory play decrease.

Figure 5 shows the curvilinear relations between Conscientiousness and mothers' demonstrations of symbolic play; both variables had been residualized for maternal age, education, and verbal intelligence. A significant cubic relation was found between Conscientiousness and demonstrations of symbolic play, adjusted $R^2_{\text{cubic}} = .031$, $F(3, 257) = 3.82$, $p < .05$, adjusted $R^2_{\text{increase}} = .018$, $F(1, 257) = 5.95$, $p < .05$. As Conscientiousness increases to -0.73, demonstrations of symbolic play increase reaching a relative maximum of 0.13, demonstrations of symbolic play then decrease as Conscientiousness increases to 0.92, at which point demonstrations of symbolic play reach a relative minimum of -0.07; after this point, as Conscientiousness increases demonstrations of symbolic play increase.

The largest condition indices for both cubic regressions were 4.09 and 4.12, suggesting that the collinearity problem that usually occurs in polynomial regression was not a concern in these two cubic regression models (Conscientiousness was centered). For both regressions, an influential outlier (Cook's $D = .73$ and $.99$) was removed from the analyses.

Child gender—Partial correlations between maternal personality and parenting practices controlling for maternal age, education, and verbal intelligence did not differ between mothers of daughters and mothers of sons with two exceptions. Neuroticism correlated with mothers' solicitations of exploratory and symbolic play in mother-son dyads, $r_s(136) = -.22$ and $.24$, $p_s < .01$, respectively, whereas no relations obtained in mother-daughter dyads, $r_s(116) = .06$ and $.05$, ns , respectively; Fisher's transformed $z_s = -2.19$ and 2.32 , respectively, $p_s < .05$. Mothers with sons who rated themselves as more anxious and insecure solicited exploratory play less often and solicited symbolic play more often, but no such relations existed for mothers with daughters.

Person Analysis

To identify mothers who possessed a certain personality profile, Ward's (1963) hierarchical agglomerative clustering method was performed using the Five Factor scores as grouping variables. This analysis seeks to minimize within-group variability while maximizing between-group variability in Euclidean distance. Results suggested that a two-cluster solution was most appropriate; we empirically identified mothers as belonging to one of the two clusters: G1 and G2. Figure 6 shows *Ms* and *SEMs* for the resulting 2 clusters.

Table 4 shows the *Ms* and *SDs* for maternal personality, cognitions, and practices for G1 and G2 mothers separately. *Ms* differed significantly across the two clusters on all Five Factors of personality. As shown in Table 4, each cluster was characterized by a relative elevation on some of the Five Factors. Group 1 consisted of mothers with higher levels of Neuroticism, Agreeableness, and Conscientiousness. These were mothers who rated themselves as more anxious, distressed, unrealistic, nervous, and insecure; more sympathetic, cooperative, and considerate; as well as more organized, responsible, and dependable. Group 2 consisted of mothers with higher levels of Openness and Extraversion. These were mothers who rated themselves as more rational, creative, and imaginative as well as more outgoing, energetic, and active in interacting with others. G2 mothers tended to be older (*Ms* = 31.75 and 30.17, *SDs* = 6.36 and 6.27, for G2 and G1 mothers, respectively), $t(260) = 1.96, p = .052$, and they scored significantly higher on verbal intelligence (*Ms* = 109.88 and 104.40, *SDs* = 16.67 and 17.17, for G2 and G1 mothers, respectively), $t(260) = 2.55, p < .05$, than G1 mothers. G1 and G2 mothers did not differ in education attainment, $t(260) = -0.77, ns$, however.

The two groups of mothers differed on two parenting cognitions and one practice. G2 mothers scored higher than G1 mothers on self-reported parenting satisfaction, extradyadic exchange, and demonstrations of symbolic play: G2 mothers evaluated themselves as more satisfied with their parenting, reported they more often engaged in extradyadic exchanges with their children, and demonstrated more symbolic play with their children. All significant group *M* differences in maternal personality and parenting cognitions and practices held when controlling for maternal age, education, and verbal intelligence.

Maternal Personality and Parenting Cognitions: Person Analysis

Table 5 presents partial correlations between the five maternal personality factors and parenting cognitions, controlling for maternal age, education, and estimated verbal intelligence, for G1 and G2 mothers. Extraverted G1 mothers evaluated themselves as more competent, and Agreeable G1 mothers evaluated themselves as more satisfied, with their parenting. Open G2 mothers were more knowledgeable about parenting; Open and Agreeable G2 mothers evaluated themselves as more invested in their parenting; and Open, Extraverted, and Conscientious G2 mothers reported that they more often engaged in extradyadic exchanges with their children.

For G2 mothers, the scatter plot of Conscientiousness and parenting knowledge (not shown; both residualized for maternal age, education, and verbal intelligence) indicated a negative relation between the two variables when Conscientiousness scores were < -1 and no relation when Conscientiousness scores were > -1 . The spline knot was estimated at an average Conscientiousness score of $-1.17, SE = 0.32, 95\% CI = (-1.80, -0.54)$. Conscientiousness factor scores were distributed with $M = -0.19$ and $SD = 1.06$; based on visual inspection of the plot, and because the 95% CI of the estimated knot location included $-1.25 (M - 1 SD)$, we used -1.25 as the knot for the piecewise linear regression. The model for the relation of Conscientiousness and parenting knowledge indicated that for G2 mothers with Conscientiousness scores ≤ -1.25 the relation was negative (standardized slope = $-.83$), and

for G2 mothers with Conscientiousness scores > -1.25 the relation was positive (standardized slope = .10), and the increase in the slope of the regression line before and after -1.25 was significant, $F(1, 161) = 8.98, p < .01$.

Two significant differences in relations between maternal personality and parenting cognitions were found between G1 and G2 mothers: Agreeableness correlated positively with reported parenting investment in G2 mothers, but not in G1 mothers, Fisher's transformed $z = 2.81, p < .01$. Conscientiousness correlated with reported extradyadic exchange in G2 mothers, but not in G1 mothers, Fisher's transformed $z = 2.08, p < .05$.

Maternal Personality and Parenting Practices: Person Analysis

Table 6 shows partial correlations between the five maternal personality factors and parenting practices controlling for maternal age, education, and estimated verbal intelligence. Open G1 mothers demonstrated more symbolic play with their children, and Conscientious G1 mothers displayed less physical affection towards their children. Agreeable G2 mothers spoke in a longer MLU and used more different word roots in speech to their children.

For G2 mothers, the scatter plot of Openness and mothers' solicitations of exploratory play (not shown; both variables residualized for maternal age, education, and verbal intelligence) indicated a positive relation between the two variables when Openness scores were < -0.50 , and no relation when Openness scores were > -0.50 . The spline knot was estimated at an average Openness score of $-0.63, SE = 0.64, 95\% CI = (-1.89, 0.63)$. Openness factor scores were distributed with $M = 0.44$ and $SD = 1.10$; based on visual inspection of the plot, and because the 95% CI of the estimated knot location included $-0.66 (M - 1 SD)$, we used -0.66 as the knot for the piecewise linear regression. The model for the relation of Openness and G2 mothers' solicitations of exploratory play indicated that for mothers with Openness scores $\leq -.66$ the relation was positive (standardized slope = .75), and for mothers with Openness scores $> -.66$ the relation was essentially flat (standardized slope = 0.01), and the decrease in the slope of the regression line before and after $-.66$ was significant, $F(1, 161) = 4.62, p < .05$.

No significant differences were found between G1 and G2 mothers in relations between maternal personality and parenting practices.

Discussion

This study used the Five-Factor model of personality in a community sample of nonclinical European American mothers of 20-month-old children to examine relations of Openness, Neuroticism, Extraversion, Agreeableness, and Conscientiousness to common and age-appropriate parenting cognitions and practices. We used each of the Five Factors as well as their combinations to assess associations with parenting cognitions and practices. The results support the view that specific personality factors relate to specific maternal parenting cognitions and practices. Both variable and person approaches proved valuable in identifying personality-parenting linkages. Adopting a person approach to personality in parenting constitutes a novel contribution to the field by casting constellations of parenting scales as units of analysis.

Overall, the five personality factors related to ~35% of parenting cognitions and <10% of parenting practices we measured. Effects that were significant ranged from small to medium in size. This general finding accords with the results of a recent meta-analysis (Prinz et al., 2009) It is important to note that our results are conservative in that we controlled for maternal age, education, intelligence, and social desirability of responding as well as

perceptions of child sociability. That said, each of the five personality factors had specific implications for specific parenting cognitions and practices. As predicted, *Openness to experience*, a positive parenting trait, had the most correlates in parenting: It was related to mothers' parenting knowledge, their reported competence and investment in parenting, and reports of their extradyadic exchanges with their children. Openness was also related to mothers' symbolic play with children.

The affective negativity associated with *Neuroticism* may amplify the stresses of life circumstances and undermine parenting. Researchers studying nonclinical samples have generally found that higher levels of maternal neuroticism are related to lower levels of warmth and sensitivity and higher levels of intrusiveness or power assertion. In consonance with this negative facet of Neuroticism, more neurotic mothers reported feeling less competent and satisfied in their parenting, and so our findings suggest that high levels of neuroticism hamper parenting in nonclinical, community samples. However, Neuroticism also has a concern construal, and nonlinear analysis revealed that mothers whose Neuroticism factor scores were in the lowest 16% range (from 0 to 16 percentile), those who rated themselves as more neurotic, also evaluated themselves as being more invested in their parenting. No such relations existed among mothers whose Neuroticism scores were either in the highest 16%, or in the central 68% (from 16+ to 84 percentile).

The positive social vitality facet of Extraversion (contra the social dominance construal) related to reported competence, self reports of dyadic and extradyadic interactions with children, as well as demonstrations of symbolic play. Of the five factors of personality, we found only one association between Agreeableness and any maternal cognition or practice we measured (language). Conscientiousness was associated with mothers' parenting knowledge, self-reports of extradyadic exchanges with children, and demonstrations of exploratory and symbolic play, but in a complex nonlinear way. These findings reinforce the notion that Conscientiousness is a positive feature of parenting, and disorder is typically not in children's best interests.

In sum, all five factors of personality are associated with maternal parenting cognitions or practices, and (as predicted) specific maternal personality factors relate to specific parenting cognitions and practices. Moreover, parenting personality-cognition and -practice relations are largely similar in mothers of young girls and boys. On the basis of this study, the most beneficial parent would be one who is high in openness to experience, extraversion (social vitality), and conscientiousness and low in neuroticism.

In the complementary person approach reached through the application of procedures that grouped individuals into clusters, mothers exhibited two configurations of personality. Bronfenbrenner and Morris (2006) divided parental person forces in child development into "developmentally disruptive dispositions" (impulsiveness, distractibility, inability to defer gratification, and difficulties in monitoring control over emotions and behavior) versus "developmentally generative characteristics" (curiosity, the tendency to initiate and engage in activity, responsiveness to initiatives of others, and ability to defer immediate gratification to pursue long-term goals). Our person analyses broadly accord with this view. One group of mothers scored higher in Neuroticism, Agreeableness, and Conscientiousness: They rated themselves as being more anxious, distressed, nervous, and insecure; sympathetic, cooperative, and considerate; as well as organized, responsible, and dependable. Another group, who were older and possessed more verbal intelligence, scored higher in Openness and Extraversion: They rated themselves as being more rational, creative, and imaginative as well as more outgoing, energetic, and active in interacting with others. These mothers evaluated themselves as more satisfied in their parenting, reported that they more often engaged in extradyadic exchanges, and demonstrated more symbolic

play. To the extent that patterns of personality affect parenting, the accumulation of small effects attributable to each trait could point to greater influence of personality on parenting than the trait-by-trait approach adopted by most studies. Our findings highlight the need to consider all of the Big Five factors of personality as well as multiple parenting cognitions and practices in the same analyses to develop a fuller picture of how maternal personality relates to parenting.

Methodological Issues and Future Directions in Personality and Parenting

The personality, cognition, and practice constructs we studied are universal to parents from all walks of life, and it is patently important to examine personality-parenting relations in nonclinical samples. We evaluated a community sample of nonclinical mothers with normal firstborn children of a specific age, and they came from families that were European American and mostly intact. This sociodemographic sampling roughly applies to a majority U.S. population. These design considerations have implications for the generalizability of the findings in the sense that moderating influences could yield different results in mothers at other stages of life or parity, or in mothers of special needs children, single or divorced mothers, or in mothers from clinical samples or different ethnic or cultural groups, just as fathers or other caregivers might display different results (Bornstein et al., 2008; Levy-Shiff & Israelashvili, 1988; McCrae et al., 2002). Indeed for these reasons, we intentionally limited the risk, ethnic, and cultural heterogeneity of the sample in this study. However, we allowed maternal age, education, occupation, and family SES to vary (and examined the role of those sociodemographic factors). Convergent and cross-cultural studies of the trait-based structure of personality tend to mitigate these limitations.

A principal component of the bioecological model (Bronfenbrenner & Morris, 2006) includes time. The present investigation is cross-sectional; a longitudinal approach is desirable to gain more insight into the causal direction of paths between parental personality and parenting. Context is important too: Neuroticism may have emerged as less of a predictor of maternal behavior because that personality dimension may not have been as relevant in the low-task-demand free-play context we studied where supportive, less controlling behaviors are easier for mothers to display. Personality factors may depend on context for their proper interpretation as well. Teaching a child may be a sign of maternal Openness at a museum, Conscientiousness over homework, or Extraversion when strangers are watching.

Some of the analyses in this study correlated sets of self-reports in mothers; that is, personality factors and parenting cognitions shared source variance. In this aspect of the study, we were specifically interested in personality correlates of mothers' phenomenological experiences of their parenting, and as a consequence we specifically sought their self-reports (Stone et al., 2000). Measures that share source variance are sometimes required and often useful, but their association needs to be evaluated with caution. Several additional features of the study mitigate this particular threat to validity as well. We evaluated and controlled mothers' tendency to social desirability in their self-reports, and different patterns of psychologically meaningful associations emerged among our predictor and criterion variables. It is important to note in this connection, too, that self-reports and observer ratings of personality often result in similar profiles (McCrae, Yik, Trapnell, Bond, & Paulhus, 1998). Moreover, if personality and cognitions shared method variance, measures of personality and practices did not.

Finally, the role of child effects in associations between maternal personality and parenting has been questioned (Clark et al., 2000). Kochanska et al. (2004) reported that child temperament predicted maternal behavior; however, in their study maternal personality factors predicted parenting after controlling for child temperament. Thus, if child effects are

important to understanding maternal behavior, maternal personality predicts maternal parenting separately. For this reason, we also controlled mothers' perceptions of their children.

Studies like the present one open the door to future research on related questions at the nexus of personality, parenting, and child development: to explicate more precisely the processes by which parental personality plays a part in the social agenda and day-to-day decision making about childrearing, to untangle the moderating role of different personality traits and patterns on the efficacy of parenting practices, to assess co-parenting in parents with similar and different personalities and personality profiles, and in the design of tailored and successful interventions, for example to offset the roles of negative personality characteristics in parenting.

Conclusions

Parenting is multiply determined, and personal resources, child effects, and context all affect parenting. It has been argued on these grounds that parenting is therefore buffered against threats to its integrity that derive from weaknesses or failures in any single source (Belsky, 1984). When some determinants of parenting are at risk, parental functioning is presumably most protected when its personal resources still function well. Moreover, personality is conceived to antecede cognitions and practices. Hence the potential importance attributed to personality in parenting. Thus, personality has both theoretical and practical significance for understanding, predicting, and changing parenting cognitions and practices. If personality drives cognitions and practices -- a common formulation in parenting science -- then understanding more about personality in parenting generally promises to contribute to understanding more about the nature of parenting cognitions and practices and their influences on child development. Much attention has been paid to the role of personality in understanding parenting problems associated with clinical syndromes, such as depression. Our analyses suggest that personality plays a role in everyday parenting in nonclinical samples as well. The results of this study were small to medium effect sizes, and so support a consistent, if modest, role.

Personality does not account for the whole of parenting, nor does it monistically shape parents' attitudes or actions or how children develop. Models of parenting and child development need to incorporate multiple sources of influence. Within such a systems framework, appreciating parent personality will enhance our understanding of variation in parenting, parent-child relationships, and child development.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Figure 1.

Standardized solution for the final model on the total sample ($N = 262$). In this figure, numbers associated with single-headed arrows are standardized path coefficients; numbers associated with double-headed arrows are standardized covariance estimates. Arrows associated with dependent variables are error variances which represent the amount of variance not accounted for by the factors. Error variances for Self-Esteem, Responsibility, and Organization were fixed parameters as required by the model.

Figure 2.
Scatter plot between Neuroticism and investment in parenting in the total sample ($N = 262$).

Figure 3. Scatter plot between Conscientiousness and parenting knowledge in the total sample ($N = 262$).

Figure 4. Scatter plot between Conscientiousness and demonstration of exploratory play in the total sample ($N = 262$).

Figure 5. Scatter plot between Conscientiousness and demonstration of symbolic play in the total sample ($N = 262$).

Figure 6.
Ms and SEMs for maternal personality by cluster groups G1 and G2.

Table 1

Descriptive Statistics for Maternal Personality, Cognitions, Practices, and Potential Covariates (N = 262)

	M	SD	Range
Jackson Personality Inventory			
Breadth of interest	47.83	10.44	23-69
Innovation	50.29	9.90	27-65
Conformity	47.35	9.19	30-72
Anxiety	48.38	9.58	20-67
Interpersonal affect	48.24	8.56	25-67
Social participation	47.02	8.79	27-68
Self-esteem	53.28	8.94	29-68
Responsibility	56.32	7.50	31-71
Organization	54.37	9.83	31-71
Parenting Cognitions			
Parenting knowledge (maximum likelihood estimate)	0.37	0.59	-1.84-1.23
Self-Perceptions of the Parental Role			
Competence ^a	4.12	0.56	2.10-5.22
Investment	3.22	0.84	1.20-5.00
Satisfaction	4.67	0.49	1.80-5.00
Parental Style Questionnaire			
Dyadic interaction	4.46	0.35	3.40-5.00
Extradyadic exchange	3.84	0.41	2.22-5.00
Parenting Practices			
Language ^b	0.00	0.88	-2.43-2.91
MLU in morphemes	4.14	0.68	2.38-6.51
Different of word roots	143.60	33.61	44-236
Sensitivity	7.24	1.24	3-9
Expressions of affection (frequency)			
Social play	0.98	1.65	0-11
Praise/endorsements	2.24	2.85	0-18
Physical affection	0.93	1.54	0-10
Exploratory Demonstrations ^b	0.00	0.85	-1.67-2.10
Frequency	6.78	4.39	0-26
Duration	61.43	55.95	0.00-269.00
Proportion frequency	0.60	0.25	0.00-1.00
Proportion duration	0.53	0.31	0.00-1.00
Symbolic Demonstrations ^b	0.00	0.86	-1.41-2.17
Frequency	4.18	2.81	0-13
Duration	53.33	50.01	0.00-270.00

	M	SD	Range
Proportion frequency	0.47	0.31	0.00-1.00
Proportion duration	0.40	0.25	0.00-1.00
Exploratory Solicitations ^b	0.00	0.90	-1.29-2.60
Frequency	8.08	7.41	0-44
Proportion frequency	0.38	0.25	0.00-1.00
Symbolic Solicitations ^b	0.00	0.86	-1.91-3.88
Frequency	13.33	9.79	0-80
Proportion frequency	0.62	0.25	0.00-1.00
Potential Covariates			
Mother			
Maternal age (years)	31.16	6.36	15.13-47.26
Maternal education ^c	5.56	1.38	1-7
Peabody Picture Vocabulary Test-Revised	107.83	17.03	60-159
Social Desirability Scale	16.77	5.07	4-33
Child			
VABS Socialization domain	104.66	8.40	79-132

^aResidualized for social desirability.

^bMean standard aggregate (z-score).

^cFrom Hollingshead (1975) Index Education Scale. Scores may range from 1 to 7: (1) Less than 7th grade, (2) 7th, 8th, or 9th grade, (3) 10th or 11th grade, (4) High school graduate or GED, (5) Partial college (at least 1 year completed), (6) Standard college or university graduate, (7) Graduate professional training (graduate degree completed).

Partial Correlation Coefficients between Maternal Personality and Parenting Cognitions Controlling for Maternal Age, Education, and Verbal Intelligence in the Total Sample (N = 262)

Table 2

	Parenting Knowledge	Self Perceptions of Parental Role			Parenting Style Questionnaire	
		Competence	Investment	Satisfaction	Dyadic Interaction	Extradyadic Exchange
Openness	.12*	.12*	.20***	.11	.12	.23***
Neuroticism	-.08	-.19**	Non-linear ^d	-.13*	-.02	-.10
Extraversion	.07	.18**	.04	.09	.15*	.17**
Agreeableness	.01	-.06	.05	.07	-.01	.04
Conscientiousness	Non-linear ^d	.07	.07	.04	-.10	.15*

Note. Degrees of freedom for the partial correlations were 257.

^dSee the text.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

Table 3

Partial Correlation Coefficients between Maternal Personality and Parenting Practices Controlling for Maternal Age, Education, and Verbal Intelligence in the Total Sample (N = 262)

	Language	Sensitivity ^a	Social Play ^a	Praise/Endearments ^a	Physical Affection ^a	Demonstrations		Solicitations	
						Exploratory Play	Symbolic Play	Exploratory Play	Symbolic Play
Openness	.00	.11	.02	-.04	.04	-.09	.19**	-.01	.06
Neuroticism	-.05	.03	.07	.00	.07	-.03	.01	-.11	.11
Extraversion	.10	.08	-.04	-.01	-.01	-.10	.16**	.00	.08
Agreeableness	.14*	-.02	-.01	-.02	.01	.02	-.04	.08	-.05
Conscientiousness	.06	.11	-.06	.11	-.06	Non-linear ^b	Non-linear ^b	.07	-.10

Note. Degrees of freedom for the partial correlations were 257.

^a Nonparametric partial correlation were computed using Spearman's ρ for the relation of the residuals of parenting practices controlling for maternal age, education, and verbal intelligence obtained using robust regression and the estimates of the residuals of maternal personality controlling for maternal age, education, and verbal intelligence obtained using linear regression.

^b See the text.

* $p < .05$.

** $p \leq .01$.

Table 4**Maternal Personality, Cognitions, and Practices by Personality Clusters**

	G1 <i>N</i> = 98	G2 <i>N</i> = 164	G1 vs. G2
Personality			
Openness	-0.74 (1.01)	0.44 (1.10)	$t(260) = -8.70, p < .001, \eta_p^2 = .23^a$
Neuroticism	0.71 (0.99)	-0.42 (1.27)	$t(241.86) = 8.06, p < .001, \eta_p^2 = .18^b$
Extraversion	-0.50 (0.98)	0.30 (0.90)	$t(260) = -6.73, p < .001, \eta_p^2 = .15^c$
Agreeableness	0.44 (0.86)	-0.26 (1.04)	$t(260) = 5.64, p < .001, \eta_p^2 = .11^d$
Conscientiousness	0.32 (0.79)	-0.19 (1.06)	$t(247.89) = 4.43, p < .001, \eta_p^2 = .06^e$
Parenting Cognitions			
Parenting Knowledge (maximum likelihood estimate)	0.31 (0.59)	0.41 (0.59)	$t(260) = -1.25, ns$
Self-Perceptions of the Parental Role			
Competence	4.03 (0.62)	4.17 (0.51)	$t(175.09) = -1.89, ns$
Investment	3.16 (0.82)	3.26 (0.85)	$t(260) = -0.93, ns$
Satisfaction	4.57 (0.55)	4.72 (0.45)	$t(260) = -2.48, p < .05, \eta_p^2 = .02^f$
Parental Style Questionnaire			
Dyadic interaction	4.42 (0.35)	4.49 (0.35)	$t(260) = -1.47, ns$
Extradyadic exchange	3.75 (0.39)	3.89 (0.41)	$t(260) = -2.60, p = .01, \eta_p^2 = .03^g$
Parenting Practices			
Language	-0.06 (0.94)	0.04 (0.85)	$t(260) = -0.88, ns$
Sensitivity			
Expressions of Affection (frequency)	7.13 (1.23)	7.29 (1.24)	Mann-Whitney U, $Z = -1.26, ns$
Social play	0.88 (1.27)	1.05 (1.84)	Mann-Whitney U, $Z = -0.13, ns$
Praise/endorsements	2.32 (2.73)	2.19 (2.92)	Mann-Whitney U, $Z = -0.42, ns$
Physical affection	0.78 (1.26)	1.01 (1.68)	Mann-Whitney U, $Z = -0.64, ns$
Exploratory demonstrations	0.08 (0.82)	-0.05 (0.86)	$t(260) = 1.12, ns$
Symbolic demonstrations	-0.15 (0.77)	0.09 (0.91)	$t(231.34) = -2.21, p < .05, \eta_p^2 = .02^h$
Exploratory solicitations	0.05 (0.82)	-0.03 (0.95)	$t(228.46) = 0.69, ns$
Symbolic solicitations	-0.06 (0.76)	0.03 (0.91)	$t(260) = -0.81, ns$

M (*SD*)^a $F(1,257) = 69.06, p < .001, \eta_p^2 = .21$, after controlling for maternal age, education, and verbal intelligence.^b $F(1,257) = 58.65, p < .001, \eta_p^2 = .19$, after controlling for maternal age, education, and verbal intelligence.^c $F(1,257) = 41.39, p < .001, \eta_p^2 = .14$, after controlling for maternal age, education, and verbal intelligence.^d $F(1,256) = 32.02, p < .001, \eta_p^2 = .11$, after controlling for maternal age, education, and verbal intelligence. The null hypothesis of homogeneity of regression slopes for the effect of maternal education on Agreeableness was rejected; therefore, two grand mean-deviated dummy covariates for G1 and G2 mothers were computed and different regression slopes were fitted for each cluster.

^e $F(1,255) = 19.30, p < .001, \eta_p^2 = .07$, after controlling for maternal age, education, and verbal intelligence. The null hypothesis of homogeneity of regression slopes for the effect of maternal age and education on Conscientiousness was rejected; therefore, two grand mean-deviated dummy covariates each for G1 and G2 mothers were computed for maternal age and education separately and different regression slopes were fitted for each cluster.

^f $F(1,257) = 4.28, p < .001, \eta_p^2 = .21$, after controlling for maternal age, education, and verbal intelligence.

^g $F(1,257) = 5.08, p < .05, \eta_p^2 = .02$, after controlling for maternal age, education, and verbal intelligence.

^h $F(1,257) = 4.34, p < .05, \eta_p^2 = .02$, after controlling for maternal age, education, and verbal intelligence.

Partial Correlation Coefficients between Maternal Personality and Parenting Cognitions Controlling for Maternal Age, Education, and Verbal Intelligence for G1 and G2 Mothers

Table 5

	Parenting Knowledge	Self Perceptions of Parental Role			Parenting Style Questionnaire	
		Competence	Investment	Satisfaction	Dyadic Interaction	Extradyadic Exchange
Openness	.05/.16*	.01/.09	.11/.25**	-.01/.06	.06/.13	.17/.19*
Neuroticism	-.18/-03	-.17/-15	.04/.14	-.09/-08	-.08/.04	-.17/.01
Extraversion	.02/.10	.21*/.09	-.01/.04	.02/.04	.17/.11	.03/.19*
Agreeableness	-.09/.05	.13/-13	-.19/.18*	.22*/.05	.05/.03	.11/.08
Conscientiousness	.12/non-linear ^a	.06/.11	.12/.08	.08/.05	-.11/-04	-.00/.27***

Note. Numbers before slash are partial correlations for G1 mothers ($df = 93$), after slash are partial correlations for G2 mothers ($df = 159$) 146). Differences in sample sizes between the two groups result in different power of detecting a significant relation for the same magnitude of correlation coefficient in the two groups. Some correlation coefficients that were significant in G2 mothers group were not significant in G1 group given the same, or in some cases greater, magnitude of correlation coefficients in the G1 group.

^a See the text.
 * $p < .05$.
 ** $p < .01$.
 *** $p \leq .001$.

Table 6

Partial Correlation Coefficients between Maternal Personality and Parenting Practices Controlling for Maternal Age, Education, and Verbal Intelligence for G1 and G2 Mothers

	Language	Sensitivity ^a	Social Play ^a	Praise/Endearments ^a	Physical Affection ^a	Demonstrations		Solicitations	
						Exploratory Play	Symbolic Play	Exploratory Play	Symbolic Play
Openness	-.05/.06	.02/.12	.17/-.04	-.01/-.09	-.17/-.01	-.16/-.04	.22*/.12	-.06/non-linear ^b	.05/.04
Neuroticism	.00/-.08	.11/.06	.04/.10	.12/-.09	.25/.01	.02/-.09	.05/.09	-.14/-.13	.17/.15
Extraversion	.17/.11	-.05/.09	.04/-.08	-.01/.00	-.10/-.03	-.18/-.05	.12/.13	.07/-.02	.04/.08
Agreeableness	.10/.17*	-.17/.07	.03/-.03	-.11/.02	.03/.03	-.02/.02	-.01/.00	-.06/.13	.07/-.07
Conscientiousness	-.07/.12	.11/.10	-.09/-.08	.13/.11	-.25* /-.01	.12/-.05	-.02/.09	.08/.05	.05/-.01

Note. Numbers before slash are partial correlations for G1 mothers ($df = 93$), after slash are partial correlations for G2 mothers ($df = 159$). Differences in sample sizes between the two groups result in different power of detecting a significant relation for the same magnitude of correlation coefficient in the two groups. Some correlation coefficients that were significant in G2 mothers group were not significant in G1 group given the same, or in some cases greater, magnitude of correlation coefficients in the G1 group.

^a Nonparametric partial correlations were computed using Spearman's ρ for the relation of the estimates of the residuals of parenting practices controlling for maternal age, education, and verbal intelligence obtained using robust regression and the estimates of the residuals of maternal personalities controlling for maternal age, education, and verbal intelligence obtained using linear regression.

^b See the text.

* $p < .05$.