

## ***Parenting Knowledge: Similarities and Differences in Brazilian Mothers and Fathers***

**Rodolfo de Castro Ribas Jr.<sup>1,2</sup>**

*Universidade Federal do Rio de Janeiro, Brasil*

**Marc H. Bornstein**

*National Institute of Child Health and Human Development, USA*

### **Abstract**

Parenting knowledge concerns child development, health and safety, and strategies to meet the physical, biological, socioemotional, and cognitive needs of children. Parenting knowledge is vital to parents' evaluation of their children's behaviors and development and to parents' everyday decisions about their children's care. Although fathers are a topic of interest and research, few studies have specifically examined fathers' knowledge about parenting. We studied parenting knowledge in a sample of Brazilian mothers and fathers. The average knowledge score obtained by mothers was significantly greater than the average score obtained by fathers, but parents of boys did not differ from parents of girls. Mothers and fathers in the same family were correlated in their parenting knowledge. For mothers, education and child age predicted knowledge score, but for fathers only education predicted knowledge score. The importance of education for parenting knowledge and the clinical implications of parenting knowledge are discussed.

*Keywords:* Parental attitudes; early childhood education; fathers; mothers.

### **Conocimiento Parental: Similitudes y Diferencias en Madres y Padres Brasileños**

#### **Compendio**

El conocimiento que los padres y las madres tienen acerca de la crianza de los/as hijos/as circunscribe el desarrollo infantil, la salud y seguridad, y las estrategias para alcanzar las necesidades físicas, biológicas, socio-emocionales y cognitivas de los niños y las niñas. Este conocimiento es vital para la evaluación de conductas y desarrollo de hijos y para decisiones cotidianas sobre el cuidado de ellos y ellas. Aunque los padres se convirtieron en un tema de investigación popular, pocos estudios han examinado el conocimiento de los padres y las madres acerca de la crianza de hijos e hijas. Nosotros estudiamos este conocimiento en una muestra de madres y padres brasileños. La puntuación media del conocimiento acerca de la crianza de hijos/as obtenida por las madres fue mayor que la puntuación obtenida por los padres. El conocimiento de las madres tuvo una correlación con el conocimiento de los padres en la misma familia. Para las madres, la educación y edad del/de la niño/a predijeron el conocimiento acerca de la crianza de hijos/as, pero para los padres sólo la educación predijo este conocimiento. Se discute la importancia de lo adiestramiento sobre la crianza de niños y niñas y las implicaciones clínicas de esto adiestramiento.

*Palabras-clave:* Actitudes de los padres; crianza del niño; padres; madres.

Researchers interested in parenting have investigated a wide range of topics classified together as parental cognitions. These topics include, for example, parental beliefs, perceptions, attributions, values, socialization goals, as well as knowledge about children's development and childrearing itself. Specifically, parenting knowledge refers to factual information or empirical evidence of some type that usually is endorsed by members of the scientific community. Thus, parenting knowledge can be differentiated from other parental cognitions in that knowledge refers to factual information, whereas values

and socialization goals, for example, refer to desirable or ideal modes of conduct or end-states of existence (see, e.g., Goodnow, 1995; McGillicuddy-De Lisi, & Sigel, 1995; Schwartz, & Bilsky, 1987; Sigel, & McGillicuddy De Lisi, 2002).

Studies of parenting knowledge themselves cover many domains. In an extensive review Bornstein, Hahn, Suizzo, Cote, and Haynes (2005) identified three main domains of knowledge: 1) knowledge about child development (i.e., knowledge about basic child requirements, abilities, and accomplishments as well as expectations about when a child will achieve a particular developmental skill); 2) knowledge about health and safety (i.e., basic information about how to promote children's health, how to prevent home accidents, and how to cope effectively with illness); and, 3) knowledge about strategies to meet the physical, biological, socioemotional, and cognitive needs of children as they develop. Parents use their knowledge to interpret their children's behaviors and development and to guide

<sup>1</sup> Address: Institute of Psychology, Federal University of Rio de Janeiro, Rio de Janeiro, Brazil. Rua Ferreira Pontes, 286 Apt. 1007A, Andaraí, Rio de Janeiro, ZIP 20541-280, Brazil. *E-mail:* rribas@ufjf.br.

<sup>2</sup> We thank Adriana Ferreira Paes Ribas and Luis Antonio Monteiro Campos for their helpful comments and collaboration. For their research assistance, we thank Camilla Velasco de Oliveira Silva, Flávia Ferreira da Silva Costa, Gabriela Aparecida Frutuoso de Brito, Giselle do Couto Costa, and Juliana Rodrigues Ramos. We also thank two anonymous reviewers for their helpful and constructive suggestions.

their own everyday decisions about their children's care and upbringing (see also Bornstein, 2002; Miller, 1988).

Parenting knowledge has been conceptualized in part as a product of personal experience with children and in part as a product of social interactions (Goodnow, 1995; McGillicuddy-De Lisi, & Sigel, 1995). Ecological views (e.g., Bronfenbrenner, 1986; Harkness, & Super, 1994, 1995) have provided useful frameworks to explain how social groups promote parenting knowledge. These frameworks have helped to explain, for instance, differences in parental expectations concerning the acquisition of intellectual, behavioral, and social abilities across cultural and social groups (see Goodnow, Cashmore, Cotton, & Knight, 1984; Hess, Kashiwagi, Azuma, Price, & Dickson, 1980; Joshi & MacLean, 1997; Rosenthal & Gold, 1989). For example, in Israel, Ninio (1979) reported that mothers of low socioeconomic status (SES) and low educational level (EL) believed that children acquire basic cognitive skills (e.g., vision, hearing, and speech comprehension) at a later age than high SES and EL mothers. In the same direction, Ninio also reported that low SES and EL mothers believed that the introduction of certain cognitively stimulating activities (e.g., start talking to the baby, start telling stories, start talking of absent objects, buy first book) should occur later than did high SES and EL mothers.

In the Philippines, Williams, Williams, Lopez, and Tayko (2000) examined expectations about children's development and childrearing practices in rural and urban mothers. In general, urban mothers and mothers with more education had higher developmental expectations (e.g., believed that children start to sit or to talk earlier). Accordingly, mothers with higher expectations also reported implementing earlier a variety of specific childrearing practices (e.g., talking to the baby, telling stories, reading the first book, introducing solid foods, teaching cognitive skills like color names).

Studies of parenting knowledge about health and safety have also provided useful information for governments and health agencies. In Italy, Angelillo, Ricciardi, Rossi, Pantisano, Langiano, and Pavia (1999) studied knowledge, attitudes, and behaviors of mothers regarding immunization. Mothers with more education and those who were older at the time of the child's birth had more knowledge regarding immunization. In Angelillo et al.'s (1999, p. 227) view, "lack of knowledge prevents Italian mothers from playing an effective role in the eradication of vaccine-preventable diseases in Italy," and educational programs could enhance parental collaboration and levels of vaccination. Similarly, in the United States, Russell and Champion (1996) identified a significant association between mothers' self-efficacy beliefs and knowledge about home-related effective injury prevention in young children. Their findings also showed that mothers' knowledge about injury prevention was positively associated with mothers' home safety practices.

Benasich and Brooks-Gunn (1996) examined the effects of maternal knowledge concerning child development and childrearing on the quality of home environment and on child cognitive and behavior outcomes in a longitudinal study of a low-birth-weight, preterm cohort. They employed several questionnaires to evaluate maternal knowledge, including a subset of 20 items extracted from the questionnaire that we employed in the present study, the Knowledge of Infant Development Inventory (KIDI, MacPhee, 1981). Benasich and Brooks-Gunn found that maternal knowledge about children's development and childrearing significantly affected the quality and structure of the home environment mothers provided which in turn significantly affected children's cognitive and behavioral outcomes. Bornstein and colleagues (2005) used the same instrument (the KIDI) in a three-part study of mothers' knowledge about children's development and childrearing, where mothers obtain their knowledge, and what factors principally influence the amount and accuracy of that knowledge. Mothers of 2-year-olds completed the KIDI and provided information about sociodemographic and health status variables as well as sources of support for their parenting. In Study 1, where 1331 U.S. mothers participated, mothers' age, education, and access to written materials each uniquely contributed to higher scores. No differences were found between mothers of girls and mothers of boys, in effects of mothers' employment status, or between birth and adoptive mothers; adult mothers scored higher than adolescent mothers, and mothers improved in their knowledge of parenting from their first to their second child. In Study 2, 74 Japanese and South American immigrant mothers to the United States were compared to mothers in their country of origin and to European American mothers in the United States. Immigrant mothers' parenting knowledge was more similar to mothers in their country-of-origin than their host country. In Study 3, 252 mothers participated representing six additional countries: Argentina, Belgium, France, Israel, Italy, and Japan. U.S., Israeli, and Belgian mothers scored highest in parenting knowledge. Moreover, written materials and attendance at childbirth classes contributed to parenting knowledge, but the contributions of fathers and friends/neighbors also emerged as significant in this cross-cultural perspective.

Two recent Brazilian studies have investigated parenting knowledge. Ribas, Seidl de Moura, and Bornstein (2003) administered a Brazilian version of the KIDI (MacPhee, 1981; Ribas, Seidl de Moura, Gomes, & Soares, 2000) and a sociodemographic questionnaire to 64 primiparous mothers of 5-month-old babies living in Rio de Janeiro. Mothers of boys and mothers of girls did not differ in their parenting knowledge, and mothers' education was the best predictor of parenting knowledge. This study gave support to the view that educational attainment, a principal indicator

of SES, plays a key role in parental knowledge. In a national study, Seidl de Moura et al. (in press) administered the Brazilian version of the KIDI and a sociodemographic questionnaire to a sample of 405 primiparous mothers of children less than 12 months of age. Data were collected in six mid- to large-size cities from four regions of Brazil (south, southeast, northeast, and north). Mothers of boys and mothers of girls did not differ in their knowledge about infant development. KIDI scores correlated with mothers' educational level, mothers' socioeconomic status, age, and children's age. Moreover, mothers' educational level and residential city were the best predictors of knowledge about infant development when infants' age entered as covariate.

Until recently, research in parenting has focused almost exclusively on mothers. This focus reflects, in part, recognition of the fact that mothers have traditionally and across cultures assumed primary responsibility for early childcare and participate in childrearing activities at significantly higher rates than fathers (see Bornstein et al., 2005). However, research interest in fathers and their role in the family life has grown significantly in the past two decades (Costigan & Cox, 2001).

Although fathers became a topic of interest and research, few studies have specifically examined fathers' knowledge about parenting. Stevens (1988), for instance, has investigated expectations for normative development in a sample of 35 low-income European American couples with young children. Mothers reported more accurate expectations for normative development than fathers. However, more accurate mothers had more accurate spouses, even when education was controlled. Hierarchical regression analyses revealed that mothers' education, fathers' education, and fathers' parenting knowledge explained significant amounts of variance in mothers' parenting knowledge. Crouter, Helms-Erikson, Updegraff, and McHale (1999) later investigated conditions underlying mothers' and fathers' knowledge about children's daily lives in middle childhood and provided evidence about the reciprocal causation between parents' characteristics and children's characteristics. In general, mothers were much more knowledgeable about their children's daily lives than were fathers. However, both mothers and fathers knew more about offspring of the same sex than about opposite-sex children.

In sum, studies of parenting knowledge frequently have investigated what types of knowledge parents have, how accurate their knowledge is, and what factors can be related to differences in knowledge level. The present study investigated these several questions in a Brazilian sample of mothers and fathers. First, what do Brazilian mothers and fathers know about childrearing and child development? Do mothers' and fathers' parenting knowledge differ? Are mothers' and fathers' parenting knowledge related? Second, what is the relevance of factors like parents' age and children's age and sex for parenting knowledge in mothers

versus fathers? In this study, we evaluated the relevance of factors thought to account for variation in parenting knowledge within a multivariate ecological perspective (e.g., Bronfenbrenner & Morris, 1998; Cohen & Cohen, 1983). From this perspective we assume that variables can be classified in order of their distal to proximal causal relations to a specific psychological construct (e.g., parenting knowledge).

## Method

### Participants

A total of 70 married Brazilian couples living in Rio de Janeiro participated. The main inclusion criteria were that (1) couples had one biological child, (2) mothers were primiparous, (3) mothers and fathers were 18 years or older, (4) all infants were term at birth, younger than 24 months of age, healthy at the time of the study, and had no significant medical problems before the study. About 76% of the fathers were first-time parents. The snowball technique was employed to identify eligible participants. The number of couples necessary for statistical analyses was estimated using power analyses; at the end of the study, analysis revealed that the sample size had adequate statistical power.

Table 1 presents sociodemographic characteristics of the sample. Fathers were older than mothers. The 7-point scale of educational level and the 9-point scale of occupational status developed by Hollingshead (1975) were employed to evaluate education attainment and occupational status of the mothers and fathers (see also Bornstein, Hahn, Suwalsky, & Haynes, 2003a). There were no significant differences between mothers and fathers in educational attainment or in occupational prestige. The Hollingshead Four-Factor Index of Social Status (HI; Hollingshead, 1975) was employed to evaluate family socioeconomic status (SES); 54.3% ( $n = 38$ ) of couples were composed of two gainfully employed parents, 38.6% ( $n = 27$ ) were composed of one gainfully employed parent, and 7.1% ( $n = 5$ ) lived with relatives and had no gainfully employed parent. For couples with two gainfully employed parents, individual SES scores of the two parents were averaged to yield the couple HI score; for couples with only one gainfully employed parent, that gainfully employed parent determined the HI score of the couple. In a previous study involving 64 households and three SES indexes, Ribas et al. (2003) verified that the HI is a reliable measure of SES in the Brazilian context. Approximately equal numbers of parents of girls ( $n = 33$ ) and boys ( $n = 37$ ) participated in the study, and they had infants approximately 9 months of age on average ( $range = 1$  to 24).

### Parenting Knowledge

The Knowledge of Infant Development Inventory (KIDI; MacPhee, 1981; see also Miller, 1988) was used to assess

Table 1.  
*Descriptive Statistics on Sociodemographic Data*

	Mothers		Fathers		<i>t</i>	<i>df</i>
Parents						
Age (years)	28.91	(6.49)	31.54	(7.84)	-2.16*	138
Education <sup>a</sup>	5.03	(1.65)	4.81	(1.46)	0.83	136
Education (%)						
Less than seventh grade	5.71		4.29			
Junior high school	2.86		2.86			
Partial high school	7.14		4.29			
High school graduate	18.57		27.14			
Partial college	17.14		28.57			
Standard college or graduation	30.00		17.14			
Post graduation	18.57		12.86			
Occupation <sup>b</sup>	6.78	(2.02)	6.19	(2.16)	1.38	101
HF <sup>c</sup>	45.85	(14.54)				
Children						
Sex (%)						
Girl	47.10					
Boy	52.90					
Age (months)	9.31	(5.55)				

*M(SD)* <sup>a</sup>Hollingshead 7-point education scale. <sup>b</sup>Hollingshead 9-point occupation scale. <sup>c</sup>Hollingshead Four-Factor Index of Social Status.  
 \* $p < 0.05$

mothers' and fathers' parenting knowledge. The KIDI was selected for this study because it provides a broad coverage of information. This coverage includes, for example, knowledge about norms and milestones (i.e., typical infant's behavior at a given point in time), knowledge about parenting strategies, knowledge about the developmental processes, and proper nutrition and health care, accident prevention, and the identification and treatment of common ailments relevant to children from birth to 2 years of age. The inventory contains 75 items, 48 of which ask respondents to indicate whether they agree, disagree, or are unsure about a series of statements; for example, "Baby girls are fragile and sick more often, so they need to be treated more carefully than boys." An additional 20 items ask respondents to choose among four responses — agree, younger, older, or unsure — in relation to statements about when a child should be able to achieve a particular milestone; for example: "Most infants are ready to be toilet trained by one year of age." The remaining 7 items are either questions or sentence completions with five possible answers; for example: "Select the most appropriate game for a one-year-old: (a) stringing small beads, (b) cutting out shapes with scissors, (c) rolling a ball back and forth with an adult, (d) sorting things by shape and color, (e) not sure". All items on the KIDI were worded so that they would be accessible to individuals with no more than a 6th grade education and so as to be free of sociocultural biases (MacPhee, 1981). MacPhee also suggested that KIDI could also be divided in subscales but did not provide psychometric properties of these subscales. In the present work we only computed scores for the full scale.

The KIDI was originally standardized on four groups: college students, mothers, doctoral level psychologists, and pediatricians in the United States (MacPhee, 1981). The proportion of total items that was correct was positively and monotonically related to the degree of practical and professional experience with children (*mean proportion correct* = 0.62, 0.72, 0.86, and 0.87, for college students, mothers, developmental psychologists, and pediatricians, respectively). Two-week test-retest stabilities for mothers ( $N = 58$ ) ranged from 0.80 to 0.92, and split-half reliabilities averaged 0.85.

Several steps were taken to promote the validity and cultural appropriateness of the Brazilian form of the KIDI and to arrive at a translation that had "adapted" equivalence from a psychological perspective (van de Vijver & Leung, 1997). The questionnaire, originally constructed and written in English, was first translated into Portuguese and then back translated by bilingual bicultural Brazilian natives using standard back-translation techniques (see Brislin, 1980, 1986). Professional psychologists or pediatricians next checked the translated instrument for preservation of meaning and cultural appropriateness. Then, professionals and bilingual mothers who were not participants in the study were interviewed regarding the cultural validity of items in the instrument. Finally, Ribas and colleagues (2000) conducted several tests to ensure that the instrument was comprehensible and ethnographically valid (van de Vijver & Leung, 1997): They evaluated the correlation between the original and the Brazilian forms of the KIDI in a sample of 20 bilingual parents ( $r_s = .75$ , one-week test-retest interval) and the internal consistency

of the Brazilian form of the KIDI in a sample of 186 parents ( $K-R\ 20 = .81$ , *Guttman split-half* = .80).

In the present study, 11 KIDI items (14, 28, 30, 31, 37, 40, 41, 52, 60, 65, 67) were omitted from the analyses because they did not reach satisfactory discrimination indices in our sample (Anastasi & Urbina, 1997). The items omitted did not reduce the wide coverage of the KIDI. Cronbach's alpha for the remaining 64 items was .72 in our sample of mothers and fathers. The proportion of total correct responses across the 64 items was calculated for each mother and father.

**Procedure**

Research assistants visited the families' homes at a time convenient for mothers and fathers. The research was briefly explained to the parents, and informed consent was obtained. Families were not paid for their participation. Mothers and fathers were asked to complete the KIDI individually. Parents also completed an extensive sociodemographic questionnaire. Each visit lasted for approximately 2:30h.

**Results**

Prior to analyses, distributions for all variables were examined for non-normalcy and the presence of outliers. The average KIDI score obtained by mothers ( $M = 0.69$ ,  $SD = 0.09$ ) was significantly greater than the average score obtained by fathers ( $M = 0.64$ ,  $SD = 0.09$ ),  $t(138) = 4.82$ ,  $p = .002$  (one tailed),  $d = .56$ . Parents of boys did not differ from parents of girls. Mothers and fathers in the same family were correlated in their parenting knowledge,  $r(68) = .45$ ,  $p < .001$ , adjusted  $r^2 = .19$ . Education is associated with parenting knowledge, and mothers' and fathers' educational attainments are correlated,

$r(67) = .67$ ,  $p < .001$ , adjusted  $r^2 = .44$ . When the association between mothers' and fathers' parenting knowledge took education attainment into account, the correlation between mother-father knowledge did not change.

The educational attainment of parents considered together correlated with their KIDI score,  $r(136) = .39$ ,  $p < .001$ , adjusted  $r^2 = .15$ . Similar correlation analyses carried out separately for mothers and fathers presented almost the same results: The educational attainment of mothers correlated with their KIDI score,  $r(68) = .43$ ,  $p < .001$ , adjusted  $r^2 = .17$ , and the educational attainment of fathers correlated with their KIDI score,  $r(66) = .35$ ,  $p < .004$ , adjusted  $r^2 = .11$ . Parents' age, for mothers and fathers separately and together, did not correlate with KIDI score; however, children's age correlated with their parents' KIDI score,  $r(138) = .19$ ,  $p < .02$ , adjusted  $r^2 = 0.03$ . Similar correlation analyses for mothers and fathers showed that child age correlated with mothers' KIDI scores,  $r(68) = .23$ ,  $p = .05$ , adjusted  $r^2 = .04$ , but not with fathers' KIDI scores,  $r(68) = 0.17$ ,  $p = 0.16$ .

A hierarchical regression analysis revealed that parents' education was significantly related to parenting knowledge,  $F(1,137) = 24.52$ ,  $p < .001$  (Table 2). Controlling for parents' education, mothers' other demographic characteristics (i.e., parents' age and sex) were significantly related to parenting knowledge,  $F(3,137) = 6.30$ ,  $p < .01$ , but only parent gender predicted parenting knowledge. Controlling for parents' education and gender, children's demographic characteristics, as a block, were significant,  $F(4,137) = 3.23$ ,  $p < .05$ , with child age uniquely predictive of parenting knowledge. The final model, retaining only significant variables, was significant,  $F(3,137) = 14.08$ ,  $p < .001$ , accounting for 22.3% of the variance. Parents with more education, mothers, and parents with older children reported greater parenting knowledge (Table 2).

Table 2. Summary of Hierarchical Regressions Analysis for Variables Predicting Parenting Knowledge (N=138)

Variables	Step 1		Step 2			Step 3			Final Model			
	$\beta$	SEB	$\beta$	$\beta$	SEB	$\beta$	$\beta$	SEB	$\beta$	SEB	$\beta$	
Parents' education												
7-Point Hollingshead Scale	.02	.00	.39***	.03	.01	.44***	.02	.00	.36***	.02	.00	.37***
Parents' demographics												
Age (years)				.00	.00	-.15						
Sex <sup>b</sup>				-.04	.01	-.20*	-.04	.01	-.23**	-.04	.01	-.23**
Infants' demographics												
Age (months)							.00	.00	.18*	.00	.00	.18*
Sex <sup>b</sup>							.01	.01	.06			
$R^2$	.15		.22			.24			.24			
Adjusted $R^2$	.15		.21			.22			.22			
$R^2-\Delta$	.15		.07			.04						
F for $R^2-\Delta$	24.52***		6.30**			3.23*			14.08***			

<sup>b</sup>(female = 0, male = 1). \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ , (2-tailed).

Table 3.  
Summary of Hierarchical Regressions Analysis for Variables Predicting Mothers' and Fathers' Parenting Knowledge

Variables	Step 1		Step 2			Step 3			Final Model			
	$\beta$	SEB	$\beta$	$\beta$	SEB	$\beta$	$\beta$	SEB	$\beta$	SEB	$\beta$	
Mothers ( $n = 70$ )												
Mothers' education												
7-Point Hollingshead Scale	.02	.01	.43***	.03	.01	.54***	.03	.01	.58***	.03	.01	.60***
Mothers' demographics												
Age (years)				.00	.00	-.24*	.00	.00	-.33**	.00	.00	-.33**
Infants' demographics												
Age (months)							.00	.00	.31**	.00	.00	.31**
Sex <sup>b</sup>							.02	.02	.10			
$R^2$	.18		.23			.33			.32			
Adjusted $R^2$	.17		.20			.29			.29			
$R^2\Delta$	.18		.05			.29						
$F$ for $R^2\Delta$	15.13***		3.92*			4.91**			10.34***			
Fathers ( $n = 68$ )												
Fathers' education												
7-Point Hollingshead Scale	.02	.01	.35**	.02	.01	.38**	.02	.01	.32**	.02	.01	.35**
Fathers' demographics												
Age (years)				.00	.00	-.09						
Infants' demographics												
Age (months)							.00	.00	.13			
Sex <sup>b</sup>							.01	.02	.04			
$R^2$	.12		.13			.14			.12			
Adjusted $R^2$	.11		.10			.10			.11			
$R^2\Delta$	.12		.01			.02			.12			
$F$ for $R^2\Delta$	9.03**		.052			0.74			9.03**			

<sup>b</sup>(female=0, male=1). \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$  (2-tailed).

Separate hierarchical multiple regression analyses for mothers and fathers were also conducted (Table 3). Mothers' education was significantly related to parenting knowledge,  $F(1,69) = 15.13, p < .001$ . Controlling for mothers' education, mothers' age was significantly related to parenting knowledge,  $F(2,69) = 3.92, p < .05$ . Controlling for mothers' education and age, children's demographic characteristics, as a block, were significant,  $F(4,69) = 4.91, p < .01$ , with babies' age uniquely predictive of mothers' parenting knowledge. The final model, retaining only significant variables, was significant,  $F(3,69) = 10.34, p < .001$ , accounting for 28.9% of the variance. Older mothers with more education and with older children reported greater parenting knowledge. Fathers' education was also significantly related to parenting knowledge,  $F(1,67) = 15.13, p < .01$  (Table 3). Controlling for fathers' education, fathers' age was not significantly related to parenting knowledge,  $F(2,67) = 0.52, p = .47$ . Controlling for fathers' education, children's demographic characteristics as a block were not significant,  $F(4,67) = 0.74, p = .48$ , and no individual babies' variable predicted fathers' parenting knowledge. The final model, retaining only significant variables, was significant,  $F(1,67) = 15.13, p < .01$ , accounting for 10.7% of the variance. Fathers with more education reported greater parenting knowledge.

## Discussion

Parents' knowledge about child development, health and safety, and childrearing is important in many aspects. Parenting knowledge is vital to parents' evaluation of their children's behaviors and development and to parents' everyday decisions about their children's care. Parenting knowledge is also particularly relevant to pediatric practice (Hickson & Clayton, 2002; Pachter & Dworkin, 1997). In fact, parents are the clinician's primary source of outside information about the child. Mothers and fathers are usually asked for their expectations, opinions, and concerns about their children's health and development during visits to clinicians and other health practitioners. The quality of clinical evaluations and the efficacy of clinical recommendations can be significantly improved when parental appraisals are taken into account.

However, parents' knowledge about child development and childrearing are moderated by several factors. As a consequence, clinicians must take into consideration the sources and the contexts of parents' evaluations when they interpret the information parents provide. As we observed, parenting knowledge is part socially and culturally

determined. Parenting knowledge about children's attainment of developmental milestones and skills, for example, differs significantly across cultural groups and is influenced by parents' education. Awareness of such differences is important to accurate interpretations of parents' reports about child health, development, and behavior by health practitioners.

In accord with other studies, we found that educational attainment in mothers and fathers played a significant role in parenting knowledge. In general, evidence suggests that one of the best strategies to improve parenting knowledge is to improve parents' education.

Mothers have traditionally assumed primary responsibility for early childcare and participate in childrearing activities more frequently than fathers. Dessen, and Braz (2000), for example, evaluated social support in a sample of low-SES Brazilian families and verified that, although fathers offered support for mothers, Brazilian mothers assumed the principal responsibility for household and childrearing activities. Our findings are in accordance with this study. First, mothers had more parenting knowledge than fathers, even when education was controlled. Second, experience with children had significant impact on parenting knowledge in Brazilian mothers but not in Brazilian fathers.

In the present study the parents' age did not emerge as an important factor for parenting knowledge. However, our sample was composed exclusively by adult parents, and so these findings should be viewed with caution. Several studies have failed to identify systematic age-related differences in parenting knowledge in adult parents (e.g., Conrad, Gross, Fogg, & Ruchala, 1992; Schilmoeller & Baranowski, 1985). However, studies that have compared adult mothers with adolescent mothers have identified age-related differences in parenting knowledge (Bornstein et al., 2003b; Ruchala & James, 1997).

Variation in parenting knowledge and its sources has implications for parenting education, pediatric training, and clinical interactions with parents. Policy programs geared to enhance parents' education might also include efforts to increase parents' knowledge of child development and childrearing. Such programs can only serve parents and their children well.

### References

- Anastasi, A., & Urbina, S. (1997). *Psychological testing*. Englewood Cliffs, NJ, USA: Prentice-Hall.
- Angelillo, I., Ricciardi, G., Rossi, P., Pantisano, P., Langiano, E., & Pavia, M. (1999). Mothers and vaccination: Knowledge, attitudes, and behaviour in Italy. *Bulletin of the World Health Organization*, 77, 224-229.
- Benasich, A. A., & Brooks-Gunn, J. (1996). Maternal attitudes and knowledge of child-rearing: Associations with family and child outcomes. *Child Development*, 67, 1186-1205.
- Bornstein, M. H. (Ed.). (2002). *Handbook of parenting* (2<sup>nd</sup> ed., Vols. 1-5). Mahwah, NJ, USA: Lawrence Erlbaum.
- Bornstein, M. H., Hahn, C. S., Suwalsky, J. T., & Haynes, O. M. (2003a). Socioeconomic status, parenting, and child development: The Hollingshead four-factor index of social status and the socioeconomic index of occupations. In M. H. Bornstein & R. H. Bradley (Eds.), *Socioeconomic status, parenting, and child development. Monographs in parenting series* (pp. 29-82). Mahwah, NJ, USA: Lawrence Erlbaum.
- Bornstein, M. H., Hendricks, C., Hahn, C. S., Haynes, O. M., Painter, K. M., & Tamis-LeMonda, C. S. (2003b). *Contributors to self-perceived competence, satisfaction, investment, and role balance in parenting: A multivariate ecological view*. Unpublished manuscript. National Institute of Child Health and Human Development, Bethesda, MD, USA.
- Bornstein, M. H., Hahn, C. S., Suizzo, M., Cote, L., & Haynes, O. M. (2005). *Experiential, Sociodemographic, and Cultural Factors Predicting Mothers' Knowledge about Child Development and Childrearing: National, Immigrant, and Cross-National Studies*. Unpublished manuscript, National Institute of Child Health and Human Development, Bethesda, MD.
- Brislin, R. W. (1980). Translation and content analysis of oral and written material. In H. C. Triandis & J. W. Berry (Eds.), *Handbook of cross-cultural psychology* (Vol. 1, pp. 389-444). Boston, USA: Allyn & Bacon.
- Brislin, R. W. (1986). The wording and translation of research instruments. In W. J. Lonner & J. W. Berry (Eds.), *Field methods in cross-cultural research* (pp. 137-164). Newbury Park, CA, USA: Sage.
- Bronfenbrenner, U. (1986). Ecology of the family as a context for human development: Research perspectives. *Developmental Psychology*, 22, 723-742.
- Bronfenbrenner, U. & Morris, P. A. (1998). The ecology of developmental processes. In R. M. Lerner (Ed.), W. Damon (Series Ed.), *Handbook of child psychology: Vol. 1. Theoretical models of human development* (5<sup>th</sup> ed., pp. 993-1028). New York, USA: Wiley.
- Cohen, J., & Cohen, P. (1983). *Applied multiple regression/correlations analysis for the behavioral sciences* (2<sup>nd</sup> ed., pp. 120-132). Hillsdale, NJ, USA: Lawrence Erlbaum.
- Conrad, B., Gross, D., Fogg, L., & Ruchala, P. (1992). Maternal confidence, knowledge, and quality of mother-toddler interactions: A preliminary study. *Infant Mental Health Journal*, 13, 353-362.
- Costigan, C. L., & Cox, M. J. (2001). Fathers' participation in family research: Is there a self-selection bias. *Journal of Family Psychology*, 15, 706-720.
- Crouter, A. C., Helms-Erickson, Updegraff, K., & McHale, S. M. (1999). Conditions underlying parents' knowledge about children's daily lives in middle childhood: Between- and within-family comparisons. *Child Development*, 70, 246-259.
- Dessen, M. A., & Braz, M. P. (2000). Rede social de apoio durante transicoes familiares decorrentes do nascimento de filhos [Social support network during family transitions to parenthood]. *Psicologia: Teoria e Pesquisa*, 16, 221-231.
- Goodnow, J. J. (1995). Parents' knowledge and expectations. In M. H. Bornstein (Ed.), *Handbook of parenting* (pp. 305-332). Mahwah, NJ, USA: Lawrence Erlbaum.
- Goodnow, J. J., Cashmore, J., Cotton, S., & Knight, R. (1984). Mother's developmental timetables in two cultural groups. *International Journal of Psychology*, 19, 193-205.
- Harkness, S., & Super, C. M. (1994). The developmental niche: A theoretical framework for analyzing the household production of health. *Social Science & Medicine*, 38, 217-226.
- Harkness, S., & Super, C. (1995). Culture and Parenting. In M. H. Bornstein (Ed.), *Handbook of parenting* (Vol. 3, pp. 211-234). Mahwah, NJ, USA: Lawrence Erlbaum.

- Hess, R. D., Kashiwagi, K., Azuma, H., Price, G. G., & Dickson, P. (1980). Maternal expectations for mastery of developmental tasks in Japan and the United States. *International Journal of Psychology, 15*, 259-271.
- Hickson, G. B., & Clayton, E. W. (2002). Parents and their children's doctors. In M. H. Bornstein (Ed.), *Handbook of parenting: Practical parenting* (2nd ed., Vol. 5, pp. 439-462). Mahwah, NJ, USA: Lawrence Erlbaum.
- Hollingshead, A. B. (1975). *The four-factor index of social status*. Unpublished manuscript. Yale University, Yale, USA.
- Joshi, M. S., & MacLean, M. (1997). Maternal expectations of child development in India, Japan, and England. *Journal of Cross Cultural Psychology, 28*, 219-234.
- MacPhee, D. (1981). *Manual: Knowledge of Infant Development Inventory*. Unpublished manuscript. University of North Carolina at Chapel Hill, USA.
- McGillicuddy-De Lisi, A. V., & Sigel, I. E. (1995). Parental beliefs. In M. H. Bornstein (Ed.), *Handbook of parenting: Status and social conditions of parenting* (Vol. 3, pp. 333-358). Hillsdale, NJ, USA: Lawrence Erlbaum.
- Miller, S. (1988). Parents' beliefs about children's cognitive development. *Child Development, 59*, 259-285.
- Ninio, A. (1979). The naive theory of the infant and other maternal attitudes in two groups in Israel. *Child Development, 50*, 976-980.
- Pachter, L. M., & Dworkin, P. H. (1997). Maternal expectations about normal child development in 4 cultural groups. *Archives of Pediatrics and Adolescent Medicine, 151*, 1144-1150.
- Ribas, R. C., Jr., Seidl de Moura, M. L., & Bornstein, M. H. (2003). Socioeconomic status in Brazilian psychological research. Part 2: SES and parenting knowledge. *Estudos de Psicologia, 8*, 385-392.
- Ribas, R. C., Jr., Seidl de Moura, M. L., Gomes, A. A. N., & Soares, I. D. (2000). Adaptação brasileira do Inventário de Conhecimento sobre o Desenvolvimento Infantil de David Macphee [Brazilian adaptation of David Macphee's Knowledge of Infant Development Inventory]. In Sociedade Brasileira de Psicologia (Ed.), *Anais do III Congresso Brasileiro de Psicologia do Desenvolvimento* (p. 183). Niteroi, Rio de Janeiro, Brazil.
- Ribas, R. C., Jr., Seidl de Moura, M. L., Gomes, A. A. N., Soares, I. D., & Bornstein, M. H. (2003). Socioeconomic status in Brazilian psychological research. Part 1: Validity, measurement, and application. *Estudos de Psicologia, 8*, 375-383.
- Rosenthal, D. A., & Gold, R. (1989). A comparison of Vietnamese-Australian and Anglo-Australian mothers' beliefs about intellectual development. *International Journal of Psychology, 24*, 179-193.
- Ruchala, P., & James, D. C. (1997). Social support, knowledge of infant development, and maternal confidence among adolescent and adult mothers. *Journal of Obstetric, Gynecologic, & Neonatal Nursing, 26*, 685-689.
- Russell, K. M., & Champion, V. L. (1996). Health beliefs and social influence in home safety practices of mothers with preschool children. *Image: Journal-of-Nursing-Scholarship, 28*, 59-64.
- Schilmoeller, G. L., & Baranowski, M. D. (1985). Childrearing of firstborns by adolescent and older mothers. *Adolescence, 2*, 805-822.
- Schwartz, S. H., & Bilsky, W. (1987). Toward a psychological structure of human values. *Journal of Personality and Social Psychology, 53*, 550-562.
- Seidl de Moura, M. L., Ribas, R. C., Jr., Piccinini, C. A., Bastos, A. C. d. S., Magalhães, C. M. C., Vieira, M. L., Salomão, N. M. R., Silva, A. M. P. M. d., & Silva, A. K. (in press). Conhecimento sobre desenvolvimento infantil em mães primíparas de diferentes centros urbanos do Brasil. *Estudos de Psicologia*.
- Sigel, I. E., & McGillicuddy De Lisi, A. V. (2002). Parent beliefs are cognitions: The dynamic belief systems model. In M. H. Bornstein (Ed.), *Handbook of parenting: Being and becoming a parent* (2nd ed., Vol. 3, pp. 485-508). Mahwah, NJ, USA: Lawrence Erlbaum.
- Stevens, J. H. (1988). Shared knowledge about infants among fathers and mothers. *Journal of Genetic Psychology, 149*, 515-525.
- van de Vijver, F. J. R., & Leung, K. (1997). *Methods and data analysis for cross-cultural research*. Thousand Oaks, CA, USA: Sage.
- Williams, P. D., Williams, A. R., Lopez, M., & Tayko, N. P. (2000). Mothers' developmental expectations for young children in the Philippines. *International Journal of Nursing Studies, 37*, 291-301.

Received 09/02/04  
Accepted 02/05/04

**Rodolfo de Castro Ribas Jr.** Professor at the Institute of Psychology of the Federal University of Rio de Janeiro, Brazil.

**Marc H. Bornstein.** Senior Investigator in the National Institute of Child Health and Human Development, National Institutes of Health, Department of Health and Human Services, Bethesda, MD, USA.