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# Mothers' and Fathers' Questions to Their Child in Mexican-Descent Families: Moderators of Cognitive Demand During Play

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*This study investigated the cognitive demand in the questions directed to Mexican-descent children by their mothers and fathers during play with three sets of toys. Nineteen boys and 18 girls were videotaped separately with each parent while playing with a feminine-stereotyped toy set (toy foods and plates) and a masculine-stereotyped toy set (toy track and cars). Both mothers and fathers asked more questions overall during the feminine-stereotyped play setting than during the masculine-stereotyped setting. Mothers asked proportionally more conceptual questions than did fathers. Other analyses revealed that child gender, language spoken, and education were significant predictors of mothers' question asking in either the feminine- or the masculine-stereotyped play setting. Attitudes toward gender equality predicted fathers' use of questions during the feminine-stereotyped setting. The findings are interpreted in relation to ecological and sociocultural models of parenting, gender, and child gender development.*

Researchers have long been interested in the ways that parents contribute to their children's cognitive development and later academic achievement.

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The use of particular didactic strategies may vary depending on the family's sociocultural background as well as the interactive setting. For example, in the United States, question asking is usually considered an adaptive teaching strategy that prepares children for the type of cognitive style emphasized in American schools (Sigel, 1982; Sigel, Stinson, & Flaughner, 1991). However, parental question asking may occur infrequently in other cultural settings where nonverbal means of learning receive greater emphasis (Greenfield, 1984; Rogoff, 1990). Also, there is some suggestion that within-cultural variations tend to occur in relation to parent and child gender (Gleason, 1987; Leaper & Gleason, 1996; McGillicuddy-DeLisi, 1988). The aim of the present study, therefore, was to investigate the extent of gender-related variations in parents' use of questions with their daughter or son in different play settings. Additionally, to complement prior studies based on samples of mostly middle-class, European-descent mothers, we specifically targeted a sample of Mexican-descent families. Furthermore, we looked at both mother-child and father-child interactions, given that most past studies investigating Mexican-descent families have focused only on mothers to the exclusion of fathers (Mirandé, 1988).

As previously noted, question asking is one type of teaching strategy that is believed to foster cognitive growth. According to Sigel (1982; Sigel et al., 1991), questions are more likely than statements to encourage children to engage in active thinking. He hypothesizes that questions are cognitively demanding because they force the responder to reconstruct knowledge and thereby to become engaged in representational thought. A distinction is made between *perceptual* (or low-level) and *conceptual* (or high-level) questions based on the query's relative emphasis on representational thought. Perceptual questions tend to focus on concrete information, require minimal representational thought, and can be answered with one word. For example, in reference to a toy zebra, a perceptual question would be "What color is the zebra?" In contrast, conceptual questions tend to emphasize abstract ideas and relationships. For example, in reference to the same toy zebra, a conceptual question would be "In what way does a zebra look like a horse?" The

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frequency of parental conceptual questions has been shown to correlate with future advanced scholastic skills in domains such as reasoning and mathematics in European-descent children (Sigel et al., 1991). Hence, parental question asking is a potentially important teaching process to consider in relation to children's potential success in mainstream American schools. Therefore, as explained next, we sought to investigate how sociocultural and educational background, parent gender, the play activity, child gender, and parent gender attitudes possibly moderate the likelihood of parents' question asking behaviors.

### *Sociocultural and Educational Moderators*

Most studies examining parents' use of questions and other forms of cognitive demand have been based on samples of middle-class, European-descent families in the United States (e.g., Gleason, 1987; McGillicuddy-DeLisi, 1988; McLaughlin, White, McDevitt, & Raskin, 1983; Sigel et al., 1991). When studies have compared different ethnic groups within the United States, a few have included both Latino and European-descent families. One exception is Laosa's (1980) study comparing Mexican-descent and European-descent mothers' teaching behaviors. He observed that Mexican-descent mothers tended to ask fewer questions than European-descent mothers when teaching their preschool-age children to build a Tinkertoy model. However, when parental education was added as a covariate, the difference between the two groups disappeared. Thus, Laosa's results suggest that socioeconomic factors may better account for variations in American mothers' teaching styles than their ethnic backgrounds. The results also call into question the appropriateness of comparing groups that are nonequivalent in more than one important way (i.e., ethnic/cultural background as well as education). Therefore, the present investigation was limited to a study of only Mexican-descent families. To consider within-group variations, however, we considered language spoken in the home as a proxy variable for acculturation (e.g., Hurtado, Gurin, & Peng, 1994; Mendoza, 1989; Rueschenberg & Buriel, 1995) as well as the parent's education level (e.g., Richman, Miller, & LeVine, 1992).

### *Parent Gender as a Moderator*

We were especially interested in the moderating influence of parent and child gender on Mexican-descent parents' use of questions. The potential impact of gender was highlighted in a recent meta-analysis examining gender effects on parents' use of questions and requests with their children (Leaper, Anderson, & Sanders, in press). Across 16 published studies with a total

sample of 401 families (from primarily middle-class, European-descent backgrounds), fathers were more likely than mothers to ask "Wh" questions ( $d = .76$ ). In contrast, mothers were more likely than fathers to ask "yes/no" questions ( $d = -.35$ ). To the extent that Wh questions may be more likely than yes/no questions to be open-ended probes that elicit more elaborated answers, this finding may be consistent with the proposal that fathers tend to place more cognitive demand on children than do mothers (see Gleason, 1987; Tomasello, Conti-Ramsden, & Ewert, 1990). Thus, a fairly substantial parent gender difference in the use of questions has been observed across studies.

### *Child Gender as a Moderator*

In addition to the parent's gender, the gender of the child is another factor that can influence parents' behaviors in certain ways (see Fagot, 1995; Leaper et al., in press, for reviews). However, the evidence for child gender effects on middle-class, European-descent parents' differential use of questions with their young children is not strong. Neither Gleason (1987) nor McLaughlin et al. (1983) found any difference in question asking directed to preschool-age daughters versus sons. However, McGillicuddy-DeLisi (1988) found that parents asked more conceptual questions and made more cognitively challenging statements with sons than daughters during a paper-folding task. Additional evidence for child gender effects on parent question asking comes from a study of middle-class parents in Mexico. Bronstein (1984) observed that Mexican fathers, but not mothers, were more cognitively constraining with their school-age daughters than sons. Overall, the reviewed studies suggest that some parents, and fathers especially, may consider it more important to encourage independent, conceptual thinking in sons than in daughters.

### *Activity Setting as a Moderator*

In addition to gender, another factor that may influence parents' use of questions is the activity setting. Accordingly, Moreno (1991) has proposed that differences between ethnic groups in overall question asking are minimized when the familiarity of the task is taken into account. For example, two recent studies of Mexican-descent parents with low levels of formal schooling found them regularly using questions when playing with their children in naturalistic settings (Vasquez, Pease-Alvarez, & Shannon, 1994; Villanueva, 1991).

For the present study, we compared parents' interactions in two play activity settings that we expected would be generally familiar to Mexican-

descent parents and children: a set of toy foods and plates, and a track and car set. Furthermore, by comparing parent-child interactions across the two play settings, we were able to investigate the extent that the selected activity setting influences parents' question asking. We hypothesized that the cognitive demand of parents' questions would be higher during activities that were gender typed for the parent's or the child's gender. Our rationale was that parents would be more familiar with, and hence, more cognitively stimulating in, gender-typed settings. In support of this hypothesis, Caldera, Huston, and O'Brien (1989) found that parents were more actively involved when they played with gender-stereotyped toys than with cross-gender-stereotyped toys.

### *Parents' Gender Attitudes as a Moderator*

Finally, we considered the extent to which parents' attitudes toward gender equality moderated any gender effects on mothers' or fathers' use of questions (e.g., see Weitzman, Birns, & Friend, 1985). Past studies (Bronstein, 1984, 1988; Siegal, 1987) finding that fathers were more likely than mothers to treat children differently on the basis of gender suggest that fathers have more rigid ideas than mothers about gender-appropriate behavior. For these reasons, we anticipated that gender egalitarian beliefs would moderate fathers' behaviors more than mothers' behaviors. It was hypothesized that gender egalitarian parents in general, and gender egalitarian fathers especially, would be more likely than their more traditional counterparts to ask conceptual questions (and thereby encourage more intellectual engagement) when playing with children in cross-gender-stereotyped toy settings.

In summary, the present study investigated parents' use of questions with their children in a sample of Mexican-descent families. Both conceptual (high cognitive demand) and perceptual (low cognitive demand) questions were analyzed. Furthermore, we considered the extent to which parents' use of questions varied depending on the parent's gender, the child's gender, the parent's gender attitudes, the play activity setting, and aspects of the parent's sociocultural background.

## **Method**

### *Participants*

Participants were recruited from commercial mailing lists and from day care centers along the central coast of California. The sample consisted of 37

Mexican-descent children ( $M = 48.89$  months,  $SD = 10.29$ ) and their parents. Of the 37 children, 18 were girls and 19 were boys. Daughters and sons did not differ significantly in age. To be included in the sample, at least one of the parents had to be of Mexican descent. Two mothers were of European descent and one mother was of Cuban descent. The remaining parents were of Mexican descent.

Demographic information indicated that the median education for mothers and fathers was between a high school degree and some college. More specifically, 33% of the mothers and 27% of the fathers did not have a high school degree; 22% of the mothers and 16% of the fathers had a high school degree or a general equivalency degree; 44% of the mothers and 57% of the fathers had some college or beyond. Of the mothers without a high school education, the lowest grade completed was 5th and the highest completed was 11th ( $M = 7.36$ ,  $SD = 1.69$ ). The lowest grade completed for fathers without a high school degree was 3rd grade and the highest was 11th grade ( $M = 6.86$ ,  $SD = 2.59$ ). Information on the educational level of one mother was not available.

Most of the parents were bilingual. Specifically, 68% of the mothers were bilingual and 70% of the fathers were bilingual. Nineteen percent of the mothers indicated that they were monolingual Spanish speakers, and 16% of the fathers indicated that they were monolingual Spanish speakers. Thirteen percent of the mothers indicated that they were monolingual English speakers, and 14% of the fathers indicated that they were monolingual Spanish speakers. During the videotaped recordings, 68% of the mothers spoke primarily Spanish, and 32% spoke primarily English. Seventy percent of the fathers spoke primarily Spanish, and 30% spoke primarily English. Language spoken during the videotaping was used as a factor in the analyses reported later.

### *Materials*

Parent-child pairs were asked to play with three different toy sets. First, there was a toy zoo set consisting of a plastic fence, some common zoo animals, and figurines. This was a gender-neutral toy set used as a warm-up session in the study. Second, there was a toy food set consisting of plastic plates, pots, and foods. This type of toy set is generally considered feminine stereotyped (Hughes, 1991). Third, there was a toy track set consisting of a track requiring assembly and trucks. This type of toy set is generally considered masculine stereotyped (Hughes, 1991). In addition to gender-stereotyped differences, the toy food and the toy track sets involve relatively different emphases on social role-play versus construction play, respectively.

### *Procedure*

Three research assistants visited families in their homes. Mothers and fathers were visited separately within approximately 1 month of each other. On arrival, one of the research assistants interviewed the parent to collect demographic information. After this information was gathered, the parent was instructed to play individually with the target child in the language in which the parent and child usually converse (i.e., English or Spanish). The parent and child were videotaped playing with a gender-neutral toy for 8 minutes. This set was included to better understand mothers' and fathers' differences in their use of questions in more than just gender-stereotyped settings. No specific hypotheses were generated about this setting. The play procedure was repeated for another 8 minutes with either the feminine-stereotyped toy set or the masculine-stereotyped toy set. The parent-child dyad was then given the remaining toy set for a final 8 minutes. The order of the masculine-stereotyped and feminine-stereotyped toys was counterbalanced. Only the two gender-stereotyped play activity settings were used in the present study.

### *Attitudes Toward Gender Questionnaire*

After the play sessions, the parent completed the Attitudes Toward Gender Questionnaire (ATG; Leaper, 1991; also see Leaper & Valin, 1996). The parent selected either an English or a Spanish version of the questionnaire. The items for the ATG were selected from the Attitudes Toward Women Scale (Spence & Helmreich, 1978) and Attitudes Toward Women Scale for Adolescents (Galambos, Petersen, Richards, & Gitelson, 1985). Both scales target attitudes regarding female roles (e.g., "Daughters should be given more encouragement than sons to get married and start a family" or "It is insulting to women to have the obey clause in the marriage ceremony"). Additionally, the ATG includes a set of complementary items that specifically target respondents' attitudes toward male roles (e.g., "A young man should not expect to have as much intimacy with his children as his wife does" or "A young man should be expected to pay all expenses on a date").

Respondents rated each item on a 6-point Likert-type scale (6 = *strongly agree*, 1 = *strongly disagree*) with some items reverse scored. High scores reflect more egalitarian attitudes. The ATG items have high internal consistency (Cronbach's  $\alpha = .92$ ). Mothers and fathers in the study did not significantly differ in their scores.<sup>1</sup>



### *Coding*

The present study analyzed parents' didactic questions. To investigate questions, all utterances with rising intonation were transcribed from the videotapes. Then, these questions were divided into didactic or nondidactic questions. Didactic questions contain both perceptual and conceptual teaching questions. In contrast, nondidactic questions include tag questions and questions related to other behaviors (e.g., "Do you have to go to the bathroom?") and were not included in the reliability measurements or analyses.

*Parents' didactic questions.* Didactic questions were divided into perceptual and conceptual questions. Perceptual questions can typically be answered with one word. They include labeling (e.g., "What is this vegetable called?") and take place in the present (e.g., "What is on the sandwich?"). In contrast, conceptual questions require reflective thought and are targeted at concepts that preschool-age children are beginning to develop (McGillcuddy-DeLisi, 1988; Sigel et al., 1991). For example, they include causal questions (e.g., "What would happen if you put the egg in boiling water?") or comparison questions (e.g., "Which foods here taste sweet?"). Also, conceptual questions may refer to past events (e.g., "Which of these foods did you have for dinner at Marina's birthday party?").

To adjust for the variations in the number of parental questions asked by parents across the play settings, proportion scores were used. The proportion score was calculated by dividing the number of conceptual questions by the total number of didactic questions asked.

### *Reliability*

Two female undergraduates who were fluent Spanish speakers were trained by a female graduate student for a period of 1 month. During the training procedure, the three coders met for an average of 10 hours a week to code videotapes and discuss the speech codes. In addition, the coders separately coded three parent-child videotapes (each videotape includes both a mother-child and a father-child interaction of 8 minutes duration). Coded videotapes were discussed and compared. After the training sessions, coders separately coded 12 videotapes which consisted of 12 mother-child and 12 father-child play sessions. The videotapes were coded in the language in which they were recorded. High reliability was found with Cronbach's alphas ranging from .91 for conceptual questions to .98 for perceptual questions.

## Results

Two types of statistical analyses were carried out. First, to test for the effects of parent gender in relation to child gender and play setting, three-way mixed-design ANOVAs were performed separately with total questions and proportion of conceptual questions. Child gender (daughter or son) was entered as a between-group factor. Parent gender (mother or father) and play setting (toy food or toy track) were entered as within-group repeated measures.<sup>2</sup> When significant main effects were observed in the analyses,  $\eta^2$  and the effect size  $d$  were computed from the observed  $F$  value (Rosenthal & Rosnow, 1984).  $\eta^2$  indicates the proportion of variance accounted for by an effect. According to Rosenthal and Rosnow, effect sizes are small if  $d$  is above .20, medium if  $d$  is above .50, and large if  $d$  is above .80. The  $\eta^2$  and the  $d$  effect size estimates are presented following the  $F$  value and  $p$  level in the results.

Second, to compare the influences of child gender, parent gender attitudes, parent education level, and parent language in relation to parents' question-asking behaviors in each of the different play settings, a series of multiple regression analyses were employed using a forward-selection method. Effect sizes can be inferred directly from the  $r$  values in the regression analyses. According to Rosenthal and Rosnow, effect sizes are small if  $r$  is above .10 (i.e.,  $R^2$  is above .01), medium if  $r$  is above .24 (i.e.,  $R^2$  is above .06), and large if  $r$  is above .37 (i.e.,  $R^2$  is above .14).

### *Analyses of Variance*

The results indicated a significant play setting main effect with total questions,  $F(1, 70) = 76.74, p < .001, \eta^2 = .52, d = 2.09$ . Least-square mean comparison tests indicated that both parents asked significantly more questions ( $p < .001$  for both parents) during the toy food setting ( $M = 24.05, SD = 13.60$  for mothers;  $M = 24.22, SD = 13.68$  for fathers) than during the toy track setting ( $M = 12.32, SD = 9.13$  for mothers;  $M = 11.14, SD = 5.72$  for fathers). The result has a large effect size. There was no significant difference between the two play settings in the proportion of conceptual questions.

A significant parent gender main effect occurred with conceptual questions. Mothers asked a higher proportion of conceptual questions ( $M = .20, SD = .15$ ) than did fathers ( $M = .15, SD = .13$ ),  $F(1, 35) = 7.38, p < .05, \eta^2 = .17, d = .92$ . The finding has a large effect size. There was no significant parent difference in the total number of questions.

Child gender did not appear as a significant main effect in any of these analyses. Additionally, there were no significant interaction effects involving either child gender, parent gender, or play setting.

### *Multiple Regression Analyses*

*Toy food play setting.* For fathers, gender attitude scores predicted their total questions,  $F(1, 33) = 11.88, p < .002, R^2 = .26$ . Egalitarian fathers asked more questions than the more traditional fathers during the toy food play setting. The gender attitude effect has a large effect size.

For mothers, child gender was a significant predictor of their total questions,  $F(1, 33) = 4.75, p < .05, R^2 = .13$ . Mothers directed more didactic questions to sons than to daughters during the toy food play setting. Additionally, mothers' language spoken was a significant predictor of their proportion of conceptual questions,  $F(1, 32) = 4.14, p = .050, R^2 = .11$ . English-speaking mothers were more likely than Spanish-speaking mothers to use conceptual questions during the toy food play. Both of these results have medium effect sizes.

*Toy track play setting.* None of the tested factors predicted fathers' or mothers' question-asking behaviors during the toy track play.

## **Discussion**

The most robust predictor in our analyses of parents' overall use of questions was the play activity setting. This factor accounted for 52% of the variance in parents' total questions. Specifically, both mothers and fathers asked more questions during the feminine-stereotyped toy food play setting than the masculine-stereotyped toy track play setting. Past studies of play between parents and children have similarly found that there is less conversation (Leaper & Gleason, 1996; Leaper, Leve, Strasser, & Schwartz, 1995) and fewer questions (Caldera et al., 1989) during play with masculine-stereotyped toys than with feminine-stereotyped toys. The large effect size associated with play setting is also consistent with previous research, indicating that the activity setting is a robust predictor of parental behavior (Caldera et al., 1989; Leaper & Gleason, 1996; Leaper et al., 1995; O'Brien & Nagle, 1987).

Parent gender was the strongest predictor in our study of parents' use of conceptual questions. It accounted for 17% of the variance. Mothers demonstrated proportionally more conceptual questions than did fathers. Our find-

ing contrasts with prior studies based on primarily European-descent samples that indicated fathers were more cognitively demanding than mothers with their children (Gleason, 1987; McLaughlin et al., 1983; Tomasello et al., 1990). Some of these researchers suggested that fathers were less cognizant of their children's cognitive abilities due to spending comparatively less time with their children than mothers. However, it has been further argued that by exceeding the child's current level, these fathers may be stimulating the child's cognitive development (Gleason, 1987; Tomasello et al., 1990). For example, conceptual questions encourage children's active thinking (Sigel, 1982). However, at least within our study's sample, the present results suggest that the mothers were either less aware of children's cognitive abilities or more concerned with challenging their children's thinking than were the fathers. Also, perhaps the Mexican-descent fathers were less interested in focusing on teaching concepts and more interested in simply playing. Playful interactions can help foster children's socioemotional development (Hughes, 1991). Indeed, Mirandé (1988) has suggested that Mexican and Mexican-descent fathers are often engaged in child care and play activities with their children. However, few studies have investigated what actually occurs during these fathers' interactions with their children or how parental beliefs may influence these play sessions. Thus, Mexican-descent children's interactions with their mothers and fathers may provide different types of benefits for children's development.

Our study also investigated possible moderator variables that may account for variations in mothers' and fathers' question asking behaviors separately. For mothers, child gender accounted for 13% of the variance in total didactic questions asked during the feminine-stereotyped toy food setting. In this context, mothers directed more questions to sons than to daughters. This result is consistent with a few prior studies' findings that mothers used more didactic behaviors with sons than daughters (McGillicuddy-DeLisi, 1988; Weitzman et al., 1985). Given that we found no child gender effect on mothers' questions during the masculine-stereotyped play setting, it appears that our result depends on the activity setting. Perhaps the mothers in our study directed fewer total questions to daughters than sons because the girls were more knowledgeable than the boys about the feminine-stereotyped play setting. To further explore this matter, we are currently carrying out a subsequent study to consider the possible relation between the child's type of answer and the parent's subsequent response.

With regards to mothers' use of conceptual questions, we found that language spoken accounted for 11% of the variance. English-speaking mothers asked proportionally more conceptual questions than Spanish-speaking

mothers during the toy food play setting. The correlation between these two factors is consistent with our expectations. Speaking English may partly reflect the mother's degree of acculturation and adaptation into middle-class American society (see Hurtado et al., 1994; Mendoza, 1989; Rueschenberg & Buriel, 1995). Therefore, it would follow that those mothers who were speaking English were more apt to use the types of teaching strategies believed to benefit children's success in mainstream American schools (see Sigel et al., 1991).

For fathers, we found that their attitudes toward gender equality acted as a significant moderator in their use of questions overall. In particular, fathers with more egalitarian gender attitudes were more apt to ask questions of their children during the feminine-stereotyped play setting. In this way, these fathers demonstrated more verbal engagement with their children during the cross-gender-stereotyped play setting compared to their more traditional counterparts. By exercising more cognitive engagement with their children during the feminine-stereotyped setting, the more egalitarian fathers were providing a nontraditional role model for their children. To the extent that this type of behavior generalizes into the families' homes (and perhaps these fathers are actually involved in cooking and household tasks), the children may be learning a more flexible understanding of gender and a broader repertoire of social-cognitive skills.

In conclusion, past researchers have argued that fathers play an important role in children's development (Mirandé, 1988; Way & Stauber, 1996). As evidenced by the contrasts in mothers' and fathers' behaviors in the present study, there may be qualitative differences in mothers' and fathers' contributions to children's cognitive development. These differences suggest that to understand more fully children's development in social settings, researchers should focus equally on mothers' and fathers' interactions with their children. Through an increased focus on father-child and mother-child didactic interactions, researchers may gain a clearer understanding of the gender-typing process and cognitive development of children from Mexican-descent families.

## Notes

1. Spearman correlations were carried to test the relationship between parent gender attitude scores and two demographic variables: parent education and language spoken during the observations. For both parents, gender attitude scores were significantly related to their level of education,  $r(36) = .36, p < .05$ , for mothers;  $r(35) = .50, p < .01$ , for fathers. Higher educated parents were more likely to have more egalitarian gender attitudes. For mothers, but not for fathers, gender attitude scores were significantly correlated with language spoken,  $r(36) = .45, p < .01$ , for mothers;  $r(35) = -.06, ns$ , for fathers. English-speaking mothers tended to have more

egalitarian gender attitude scores. Mothers' and fathers' gender attitude scores were not correlated,  $r(34) = .03, ns$ .

2. Researchers differ in their opinions on the use of parent gender as a repeated measure. Because each mother and father is different, parent gender is not truly a repeated measure but rather a nested factor. However, if parent is treated as a nested factor, it is not possible to test for parent main effects. One possibility is to make parent gender a between-group factor by having children only seen with one parent (e.g., Fagot & Hagan, 1991). In contrast, other data analysts argue that the advantages of including data from both parents far outweigh any statistical limitations and consider the repeated measures ANOVA as adequately robust to treat parent as a within-group factor (D. Harrington, personal communication, August 28, 1995; also see Brody, Pellegrini, & Sigel, 1986; Kerig, Cowan, & Cowan, 1993, for examples of other studies using parent gender as a repeated measure).

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