

Maternal Control Style and the Mastery Motivation of One-year-olds

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ABSTRACT: Forty-one mothers and their 12-month-old infants participated in a study of the effects of maternal control style on infant mastery motivation. Three scales were designed to assess maternal control style during a mother-infant play session. Mastery motivation was assessed in an experimenter-administered structured toy play procedure. Three components, persistence, competence, and affect, comprised the measure of mastery motivation. Mothers also completed questionnaires on child-rearing attitudes, infant temperament, and control style. Results showed that maternal attitudes and behavior were correlated with infant mastery motivation. More specifically: autonomy-oriented control behavior, sensitive care and knowledge of child-rearing were positively related to infant mastery motivation. The results provide converging evidence regarding the multiple aspects of maternal behavior which affect infant motivation.

Motivation to master the environment is recognized increasingly as an early, separate component of competence (Yarrow, Morgan, Jennings, Harmon, & Gaiter, 1982). Until recently, researchers were more concerned with the determinants of competence than with factors that foster or impede the development of motivation in infancy. Among the factors shown to affect competence are maternal sensitivity (Ainsworth, Blehar, Waters, & Wall, 1978; Lamb & Easterbrooks; Lewis & Coates, 1980), quality of infant-mother attachment (Matas, Arend, & Sroufe, 1978; Arend, Gove, & Sroufe, 1978; Waters, Wippman & Soufe, 1979), and amount of maternal stimulation (Yarrow et al.,

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1982). Several theorists have suggested that an innate motivation to become competent—sometimes called mastery or effectance motivation or executive skill—promotes the seeking out of mastery experiences in the environment and is a precursor to the development of competencies (White, 1959; Deci, 1975). The poor predictability of infant measures to later cognitive functioning has been attributed by some (Yarrow & Pedersen, 1976) to the failure to include measures of motivation to become competent.

In order to develop a sense of competence, infants must have the sense that they themselves determine their responses to the environment (Hunt, 1971; Deci & Ryan, in press). During the second year of life, when children begin to assert autonomy, they need to experience free choice or autonomy in affecting the environment (Erickson, 1950). The present study investigated the manner in which maternal control style, or the characteristic maternal tendency toward being controlling or supportive of autonomy, affects infant motivation to master the environment.

Deci and Ryan (in press) discuss the need to feel self-determining. They argue that events that allow a person to experience self-determination (choice) and competence enhance intrinsic motivation for and enjoyment of the activity. When individuals experience their behavior as other-determined, their intrinsic motivation for the activity is undermined. Thus the controlling versus autonomy-supportive nature of important people affects motivation to engage in activities and to master the environment. Deci, Schwartz, Sheinman, and Ryan (1981) designed a measure to assess adults' tendencies toward controlling versus supporting autonomy in children (the "Problems in the Schools" questionnaire). In one study, conducted in an elementary school, autonomy-supportive teachers had pupils who were more intrinsically motivated in the classroom and who perceived themselves as more competent than children of control-oriented teachers.

Few studies have dealt with either maternal control style or infant mastery motivation. Schaeffer and Crook (1979), in a descriptive study of one- and two-year-olds, found that attention and nonverbal controls were used more frequently with the younger group while action and verbal controls were more common with the older children. Jennings, Harmon, Morgan, Gaiter, and Yarrow (1979), reported that maternal use of prohibitions in the home was associated with cognitively less mature play and low effect-production on toys used in their laboratory. Croft (1977) found that maternal use of autonomy-inducing instructions in a teaching situation was associated with internal locus of control in four-year-olds, whereas intrusive interventions, were associated with external control orientations. These findings suggest that children whose mothers encourage autonomy feel responsible for their actions.

Since mothers must typically socialize and ensure the safety of their infants, they must often impose limits and restrictions. The preceding review suggests that mothers who set certain limits within which they encourage autonomy will facilitate mastery motivation in their children. Mothers who do not

respond to the child's growing needs to explore and independently master the environment may interfere with his/her motivation to become competent.

In this study, maternal control style was assessed in two ways, namely through self-report and behavioral observation during a mother-child task situation. A three-component measure (Morgan, Harmon, Gaiter, Jennings, Gist, & Yarrow, 1977) was used to assess mastery motivation, i.e., infants' persistence, competence, and affect in a structured toy play situation. This three-component conceptualization allowed for differential predictions about relationships between maternal and other contextual variables such as SES, infant temperament, and knowledge of childrearing, and the three indices of mastery motivation.

Maternal behaviors and attitudes were expected to be related to infant motivation to perform tasks. Specifically, maternal control style and sensitivity were hypothesized to be positively associated with infant mastery motivation as was maternal knowledge of child-rearing. Finally, it was predicted that perceived infant difficulty would be associated with a controlling maternal style.

METHOD

Subjects

The subjects were 41 Caucasian mothers (21 primiparas, 20 multiparas) and their 12-month-old infants (X age = 373 days, SD = 18 days, 24 boys, 17 girls). The subjects were distributed across four social classes (I = 21.5%, II = 19%, III = 38%, and IV = 21.5%) on Hollingshead's Two Factor Index of Social Position (1957). The mother-infant dyads were recruited through birth announcements in a local newspaper.

General Procedure

The mother-infant pairs visited the Psychology Department once. Data were obtained from two laboratory sessions and from maternal questionnaires. The laboratory was a 5m x 5m carpeted playroom equipped with a one-way mirror. First, mothers and infants interacted in a structured play situation from which maternal control style and sensitivity were assessed. Secondly, infant mastery motivation was assessed in a separate experimenter-administered mastery session. Finally, the mothers filled out three questionnaires in the laboratory or took them home to complete and return later. All but two mothers chose to complete the questionnaires at home.

Maternal Control Style Measure

Upon arriving at the laboratory, subjects were shown into the playroom. Mothers were told that we were interested in children's play in various situations. The mothers and infants were seated on the floor, and the mothers were presented with three toys, one at a time, by a female experimenter. The experimenter asked the mother to "demonstrate the toy to your infant and sit next to him/her while he/she plays with the toy." The intentional ambiguity of the instructions was to maximize the variability of mothers' responses to the situation. The experimenter then left the room for two minutes, after which she returned and handed the mother the next toy. The procedure was repeated for the three toys (Busy Box, Top-Off Bear, and Shape Sorter).

Mothers' and infants' behavior during the toy play was video- and audio-taped. The tapes

were later analyzed in 10-second intervals of interaction. Maternal behavior was rated on three scales, each ranging from 1 (controlling) to 5 (autonomy-oriented). Ratings on the three scales, constructed specifically for this study, were based on maternal vocalizations, maternal task-oriented behavior, and maternal affect. Controlling communications were defined as those that sought to change the infants' ongoing activity (e.g., verbal prohibitions and directions, guiding the child's hand away from one part of a toy, or stern, disapproving affect). Autonomy-oriented communications were those used by mothers to help maintain the infant's ongoing activity (e.g., verbal information or feedback, holding the toy still so the infant could manipulate it, or positive encouraging affect). Maternal behavior was rated during each interval on each of the three scales to assess the predominant level of behavior during the interval. Mean control-to-autonomy scores were computed for each of the three scales across intervals and toys.

Trained observers also rated maternal sensitivity to the infants' communications from the same session on the 9-point sensitivity scale, (1 = highly insensitive to 9 = highly sensitive) developed by Ainsworth et al. (1978).

Questionnaires

Following the experimental session, mothers were handed a packet of four questionnaires. They were told that we were interested in mothers' attitudes about childrearing issues. It was emphasized that there were no right or wrong answers to the questions. Mothers were asked to complete the questionnaires independently.

A background questionnaire yielded information about the demographic variables age, education, and occupation of the parents. Socioeconomic status was determined from that measure using Hollingshead's Two Factor Index of Social Position (Note 2). This procedure combines a score for level of education and one for occupation to yield one composite score, which corresponds to one of five socioeconomic classifications. Infant temperament was assessed using a revised version (Pedersen, Anderson, & Cain, 1976) of Carey's Perception of Infant Temperament Questionnaire (Carey & McDevitt, 1978) involving nine temperament dimensions, five of which comprise a "perceived difficulty" score. Mothers indicated on 3-point scales, ranging from very much (3) to not at all (1), the extent to which 70 items applied to this infant. Mothers' orientation toward controlling versus supporting autonomy in children was assessed by the "When Your Infant Gets Older" questionnaire, an adaptation of "Problems in the Schools" questionnaire (Deci et al., 1981) previously used with teachers. Mothers were asked to imagine that their infants were school-age and to imagine what their solutions to several child-related problems might be. The "When Your Infant Gets Older" questionnaire contains eight child-rearing vignettes (e.g., "Donny loses his temper a lot and has a way of agitating other children"). The four response options for each vignette represent four points on a control to autonomy continuum (highly controlling, moderately controlling, moderately autonomous, highly autonomous; e.g., the highly controlling response option for the item above is: "put him in a special class that has the structure and reward contingencies which he needs," and the highly autonomy-supportive option is "realize that Donny is probably not getting the attention he needs and start being more responsive to him"). Mothers checked the appropriateness of each response on a scale of 1 to 7. Summed responses across vignettes to each of the subscales were weighted by a given factor (-2 for the highly controlling scale, -1 for the moderately controlling scale, 1 for the moderately autonomous, and 2 for the highly autonomous scales). Weighted values were summed to yield one score from -18 to +18. Knowledge of childrearing was assessed using the Maternal Childrearing Attitudes Questionnaire (Field, Widmayer, Stringer, & Ignatov, 1980). The scale includes 13 questions, each with two-choice responses, (e.g., "a baby should be fed: a) on schedule, b) when he's hungry"). The number of optimal responses, as defined by Field et al. (1980), comprised a total score.

Infant Mastery Motivation Assessment

The assessment of mastery motivation was based on a shortened version of the measure designed by Morgan et al. (1977). The mother was asked to sit on a chair across the room from her infant, who was seated on the floor. She was instructed not to talk to or interact with her child. A second female experimenter then demonstrated, and handed the child, one of six toys and told the child to "make it work." Two of the toys were effectance production toys (i.e., provided the

infant the opportunity to secure feedback or produce auditory effects by using a manipulator, e.g., the Busy Beezer), two represented the category of "practicing emerging skills" (i.e., offered the child the opportunity to combine objects in appropriate ways, e.g., Cobbler's Bench) and two were problem-solving toys (i.e., required infants to circumvent a barrier or obstacle in order to obtain a goal object, e.g., transparent barrier). The infants played independently with each toy for two one-minute trials. At the end of the first trial, the experimenter repeated the instruction to "make it work." The experimenter did not interact with child beyond these instructions. If the child seemed restless or fussy during a trial, "a time out" was called during which the mother played with her child for a minute and the trial was resumed. (This happened once.) After all six toys had been presented, three of them were placed on the floor for one minute. During that time, while the experimenter asked the mother if she owned any of the toys, the infant was allowed to engage in free play. Only one mother reported that her infant had previously been exposed to one of the mastery toys.

Videotapes of the infants manipulating the toys were rated for persistence, competence, and affect. Persistence was the amount of time (in seconds) infants spent in task-related behaviors. Task-related activities included appropriate attempts, successful or not, to produce the effect, combine the objects, or obtain the goal object. Appropriate task-related behaviors were defined as those that could lead to a solution that the toy was designed for. All appropriate behaviors were defined operationally during earlier pilot testing. A score of competence was computed by adding the number of solutions (x2) and the number of appropriate task-directed attempts at solutions (x1). Affect was rated for each trial on a scale from 1 (predominantly negative, crying, fussing) to 5 (predominantly positive, smiling, laughing). Mean competence, persistence, and affect scores were computed by averaging across trials and toys. Mean scores were computed separately for the free play session.

Reliability

Mother-child task situation. Two trained raters viewed and independently scored in ten-second intervals the mother-child interaction on the three maternal scales. Initial interrater reliability for the scales was very high (all r 's $> .92$, $p < .001$). If raters disagreed on a score, they discussed the discrepancy until consensus was attained.

Infant Mastery Motivation Assessment

The rating procedure was similar to the one used by Morgan et al. (1977). Two pairs of raters were trained extensively on ten practice tapes until interrater agreement was $> 90\%$, i.e., a discrepancy of one point or less. These pairs consisted of one person who had been involved in rating the maternal control style session and one who had not seen the tapes before or been involved in any parts of the laboratory session. The videotapes were each viewed twice by a pair of raters, the first time counting the number of appropriate task manipulations in each one-minute trial, the second time one rater used a stop watch to record the number of seconds the infants persisted in task directed activity while the other rated affect.

Sensitivity. Two pairs of trained raters observed and independently scored maternal sensitivity during the mother-child task situation. Reliability training consisted of ten pilot sessions under the supervision of the first author. In the case of discrepant ratings, the tape segment was reviewed and discussed until agreement was reached. Each pair viewed each of the tapes. Interrater agreement for the three toys was greater than 75% prior to discussion.

RESULTS

Relationships between self-report and behavioral measures of maternal control style

The three maternal behavioral control scales; vocalizations, task-directed

behavior, and affect, were designed for this study to assess the same control-to-autonomy continuum as the questionnaire, "When Your Infant Gets Older." To assess their concurrent validity, correlations between the questionnaire responses and scores on the three behavioral scales were computed. The results showed that two of the maternal scales were significantly related to questionnaire responses; the vocalizations scale ($r = .31$, $p < .05$) and the affect scale ($r = .33$, $p < .03$). The maternal task-directed behavior scale was unrelated to scores on the questionnaire.

Relationship between maternal variables and infant mastery motivation

First, correlational analyses of the three mastery measures indicated that competence and persistence were highly correlated ($r = .92$, $p < .0001$) as were competence and affect ($r = .38$, $p < .01$) and persistence and affect ($r = .37$, $p < .01$).

Next, relationships between maternal control style, sensitivity, and questionnaire responses on the one hand, and the three indices of mastery motivation on the other were assessed using Pearson correlations (see Table 1). The results indicated that the maternal control style scale, task-directed behavior, was significantly related to persistence, suggesting that infants of more autonomy-supportive mothers were more persistent. Neither maternal vocalizations nor affect were correlated with persistence. None of the three

Table 1
Correlations Between Maternal Variables and Infant Mastery Motivation Indices

Maternal Variables	Mastery Session		
	Persistence	Competence	Affect
Control Style Scales			
Vocalizations	.30	.28	.10
Task-directed Behaviors	.33**	.25	.23
Affect	.10	.12	.23
Questionnaires			
Maternal Childrearing Attitudes	.31*	.34**	.38***
"When Your Infant Gets Older"	.12	.09	-.03
Perceptions of Infant Temperament	-.27	-.35**	-.12
SES	.03	.16	-.06
Sensitivity	.31*	.31*	.09

* $p < .05$

** $p < .03$

*** $p < .01$

maternal control style scales were related to either infant competence or affect nor to infant persistence, competence or affect during free play.

Following this, the relationships between three maternal measures, childrearing attitudes, sensitivity, and perceptions of infant temperament, and infant mastery measures were determined. Childrearing attitudes were positively related to all three infant behavior measures. The infants of more, compared to less, knowledgeable mothers were more persistent, affectively positive and competent. Maternal sensitivity during the mother-infant toy play was positively associated with persistence and competence but not with infant affect. Perceptions of infant temperament were negatively related to competence but unrelated to persistence or affect. Infants seen as more difficult by their mothers were less competent during the mastery session than those seen as less difficult.

In order to determine the relative importance of maternal variables in predicting mastery motivation, step-wise multiple regressions were carried out on the overall and free play motivational indices. Predictors entered were the three control scales, the two questionnaires (Maternal Childrearing Attitudes and "When Your Infant Gets Older"), SES, perceived infant difficulty, and sensitivity. Significant predictors of persistence were child-rearing attitudes and task-directed behavior ratings ($F 1,35 = 4.75, p < .03$ and $F 1,35 = 4.95, p < .03$, respectively; multiple $R^2 = .27$), while those of competence were child-rearing attitudes ($F 1,34 = 8.57, p < .003$) and perceived difficulty ($F 1,34 = 3.94, p < .05$; multiple $R^2 = .27$). Finally, maternal affect ($F 1,35 = 7.34, p < .01$) and the "When Your Infant Gets Older" questionnaire responses ($F 1,33 = 4.14, p < .05$; multiple $R^2 = .24$) positively predicted affect during free play. No other variables emerged as significant in the regression analyses.

Relationships among maternal behavior and questionnaire responses

To examine the intercorrelations among the control style behavioral scales, and to determine the relationships between maternal sensitivity, maternal questionnaire responses, and maternal control style, Pearson correlations were computed (see Table 2). As can be seen in Table 2, the three maternal control style scales were highly interrelated. Maternal sensitivity was positively correlated with all three maternal scales and maternal childrearing attitudes with two, vocalizations and affect.

In addition (not shown in Table 2), maternal childrearing attitudes were positively related to maternal sensitivity ($r = .33, p < .04$). One component of SES, family level of education, was related to scores on the "When Your Infant Gets Older" questionnaire ($r = .50, p < .0001$). Finally perceptions of infant temperament were unrelated to maternal variables.

DISCUSSION

The present study examined the relationship between maternal control style, assessed behaviorally and through questionnaire responses, and the mastery motivation of one-year-olds. Three behavioral scales were constructed to measure three dimensions of maternal control style on a continuum ranging from controlling to autonomy-supportive—vocalizations, task-directed behavior, and affect. Infant persistence, competence, and affect comprised the measure of mastery motivation. The results suggested that maternal attitudes and behavior affected infant persistence at mastering the environment. Specifically, infants whose mothers through their overt behavior supported their autonomous attempts at mastering a set of challenging tasks were more persistent than those whose mothers were more controlling. In addition, mothers who provided more sensitive care or who had more knowledge about childrearing had infants who were more motivated on tasks. These findings provide converging evidence for the effects of multiple maternal behaviors on infant motivation. In addition, the analyses indicated that behavioral assessments rather than self-report measures of maternal control style may be better predictors of infant behavior during mastery tasks.

The absence of relationships between the maternal vocalizations and affect

Table 2

Intercorrelations Among, and Maternal Correlates, of Maternal Control Style

Control Style Scales	Maternal Variables		Affect
	Vocalizations	Task Behavior	
Vocalizations			
Task Behavior	.44***		.54***
Affect			.29
Sensitivity	.71***	.59***	.30*
Childrearing Attitudes	.33**	.23	.38***

* $p < .05$

** $p < .03$

*** $p < .01$

scales and infant mastery motivation may be explained by the subtlety of the behaviors tapped by these scales. Maternal task-directed behavior may be a more overt dimension of maternal control style. At the age of one year controlling behaviors such as manipulating the baby's hands may have quite different effects on the child's perceptions of his/her independence in affecting the environment than directive comments or disapproving affect, which may be less easily perceived. The significant correlations between the more subtle scales and the maternal control style questionnaire indicate that this self-report measure may also tap more subtle aspects of maternal styles. These results confirm previous findings suggesting that maternal report is a poor predictor of both infant and maternal behavior (Yarrow, Campbell, & Burton, 1968; Wasserman, 1977). Mothers may be unable to report accurately the more overt aspects of what they do with their infants, or they may not always do what they say they will do.

Maternal control style was unrelated to infant affect and competence. One explanation for the lack of significant correlations between maternal control style and affect lies in the low variability among infants in affective responses. As in the Yarrow et al. study (1982), infant persistence at tasks was often accompanied by serious absorption and expression. There was more variability in infant affect during free play. Both the maternal control style questionnaire and maternal affect predicted infant affect during free play. Affect during structured play may be a complex component of motivation. Intense interest during goal-directed behavior may reflect high motivation, and, thus, serious or neutral affect should be expected. Positive affect may be more prevalent during unstructured play than during a challenging task. The lack of a relationship between maternal control and infant competence may reflect the fact that competence is influenced by maturational and temperamental factors at this age. Competence requires ability and practice and may be viewed as the outcome of successful mastery attempts (Frodi, Keller, Foye, Liptak, Bridges, Grolnick, Berko, Lawrence, & McAnarney, in press). This hypothesis was supported by the overall low level and low variability of competence among our subjects. Furthermore, the toys involved were deliberately chosen to be demanding and relatively difficult (see Morgan et al., 1982).

Maternal childrearing attitudes and sensitivity were, however, both related to infant competence. According to Yarrow, Rubenstein, and Pedersen (1975) maternal stimulation and sensitivity promote the infant's innate propensity to develop competent behaviors and to engage the environment. In the present study, sensitivity appeared to be a more global measure than maternal control style predicting both infant persistence and competence. Clearly, a consistent, responsive mother is necessary for infants to perceive a contingency between their actions and responses (Lewis & Coates, 1980). Sensitive responding, however, is a complex process including the ability to perceive infant signals and needs, interpret them correctly, select an appropriate response, and im-

plement it effectively (Lamb & Easterbrooks, 1980). Maternal control style and knowledge of childrearing may both be components of the complex construct of sensitivity.

Except for infant affect, maternal variables were unrelated to infant outcomes during unstructured free play. This finding is consistent with the assertion that it is the quality of play rather than amount of exploration that is affected by environmental variables (Jennings, et al., 1979). Piaget (1952) suggested that cognitive skills develop through the exercising of goal directed behaviors. Thus, motivation refers to the production of effects and obtaining feedback rather than simply exploring the environment. It is these behaviors, i.e., persistent efforts in the face of new challenges, that are enhanced by autonomy-supportive mothers.

In summary, overt aspects of maternal control style influence infants' motivation to master the environment. It was suggested that during the period of the child's increasingly autonomous functioning (Erickson, 1950) mothers supportive of autonomy in their children increase their children's perceptions that they can independently affect the environment and thereby their motivations to exercise their abilities. Although maternal sensitivity may be a prerequisite, autonomy-supportive maternal behaviors may further enhance infant motivational development.

The results of this study point to the need to include motivational variables in infant measures of competent functioning. Although highly related (Yarrow & Pederson, 1976), cognitive and motivational variables may be predicted by different early variables and may predict differentially to later functioning. One of the reasons for the often observed poor predictability of infant measures to late cognitive functioning may have been the failure to include assessments of motivation (Yarrow & Pedersen, 1976). The infant must be motivated to exercise developing schemas in order to become competent. In turn, successful interactions with the environment will be self-reinforcing and self-perpetuating (Yarrow & Pedersen, 1976). Future research might examine the relationship between persistence and later measures of cognitive and social development as well as explore the nature of the relationship between early maternal control style and later cognitive and motivational measures.

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Mothers and Fathers and Mothers and Babies: Interrelationship among Relationships

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ABSTRACT: The relationship between perceived marital satisfaction and early mother-infant interaction was investigated. Seventeen mothers and their three-day-old infants served as subjects. Dyads were observed via a modified time-sampling technique during a hospital feeding session. Then mothers completed a questionnaire concerning their perceptions of the marital relationship. Correlational analyses revealed a significant covariance of positive perceptions of the expressive aspects of the marital relationship and heightened social interaction for mother and infant. An interrelationship was observed between mother-neonate social-visual communication and maternal reports of planned pregnancies, time spent talking with spouse, general ratings of "getting along with spouse," and positive overall evaluations of the marital relationship. Also observed was the interrelationship of mother holding infant away from close bodily contact with reports of decreased love felt toward spouse, less optimal perceptions of ease of emotional expression and spousal interest in maternal daily activities, and less optimal overall ratings of the relationship. Implications of the results and the need for further research are discussed.

The early mother-infant interactional system has been called a psychobiological system in which behavioral outcomes result from constant changes and mutual adjustments in both maternal and infant characteristics during the first few weeks. However, the infants' individual characteristics may be masked by predetermined maternal characteristics including parity (Thoman, Barnett, & Leiderman, 1971; Thoman, Leiderman, & Olson, 1972), socioeconomic status (Tulkin, Kagan, 1972) and maternal attitudes or perceptions (Campbell, 1977). For example, in comparison to multiparous mothers, primiparous mothers spend more total time in feeding periods, talk to their infants more, particularly their male infants, and spend more time feeding male infants (Thoman, Leiderman, & Olson, 1972). Tulkin and Kagan have found that in comparison to working-class mothers, middle-class mothers provided more verbal stimulation and a greater diversity of

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