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Antecedents and Consequences of Mothers' Autonomy Support: An Experimental Investigation

Wendy S. Grolnick, Suzanne T. Gurland, Wendy DeCourcey, and Karen Jacob
Clark University

This study examined the effects of contextual and individual differences on mothers' autonomy support versus control on homeworklike tasks. Sixty mothers and their third-grade children worked on map and poem tasks, with mothers in either an ego-involving (high pressure) or a non-ego-involving (low pressure) condition. Later, children worked on similar tasks themselves. Mothers in the high-pressure condition were more controlling on the poem task. For the map task, mothers who came in with controlling styles and received the high-pressure manipulation were most controlling. Children whose mothers interacted in a more controlling manner wrote less creative poems when alone. Results suggest the importance of context, children's competence levels, and mothers' styles in determining levels of autonomy support.

The key role of parents in children's school success is, at this point, undisputed. From early work demonstrating that family background factors account for a large proportion of children's school achievement (e.g., Coleman et al., 1966) to current work showing that parenting styles are associated with children's school success (e.g., Dornbusch, Ritter, Leiderman, Roberts, & Fraleigh, 1987; Grolnick & Ryan, 1989; Steinberg, Elmen, & Mounts, 1989), the literature consistently supports parents' impact on their children's school performance.

Much of the work examining the link between parents and their children's school success has focused on parents' involvement in their children's schooling. Parents differ widely in both their levels of involvement and the types of involvement in which they engage (volunteering at school, reading at home, etc.; Grolnick & Slowiaczek, 1994). Yet across a wide range of ages and socioeconomic strata, it has been demonstrated that when parents are involved, children are more motivated (Grolnick & Slowiaczek, 1994) and more successful in school (e.g., Epstein, 1991).

In addition to the level and type of involvement in their children's schooling, one can also consider *how* parents interact with their children around school-related activities. One dimension along which to consider this issue is the degree to which parents work with their children in a way that supports children's autonomy rather than controlling their behavior. Parents may, for example, work with their children on homework in a way that supports children's initiations, allows them to solve their own problems, and facilitates their taking responsibility for their own work. Conversely, parents can interact in a way that directs and channels children's behavior, and solve the problems for the children.

This dimension of autonomy support versus control is related to various dimensions of parenting found in the literature, including authoritarian versus authoritative (e.g., Baumrind, 1967, 1991; Steinberg et al., 1989) and psychological control versus psychological autonomy (e.g., Barber, 1996). Most of the parenting studies that have examined dimensions related to autonomy support versus control have been field studies, in which parenting is assessed using paper-and-pencil measures and related to children's school achievement. Several of these studies have shown that children display higher motivation and do better in school when parents allow give-and-take and involve children in decision making rather than pressuring and directing them and squelching open discussion (Dornbusch et al., 1987; Eccles et al., 1991; Grolnick & Ryan, 1989). The few studies that focus on autonomy support versus control in the laboratory have examined play situations rather than school-type tasks (e.g., Deci et al., 1993; Grolnick, Frodi, & Bridges, 1984). To date, no studies have observed parents' autonomy support on schoollike tasks and its relation to children's motivation and learning for the same task.

Accordingly, in this study, we observed parents' levels of autonomy support versus control during mother–child interaction on schoollike tasks. In doing so, we sought to answer two questions. First, what factors determine how autonomy supportive versus controlling mothers are in interacting with their children on learning tasks? This is an issue of both theoretical and applied interest. Its study promises to provide information about the processes involved in contextual influences on motivation. In addition, if we can identify situational factors that influence parents' levels of autonomy support, teachers or other professionals can use this information to promote successful interactions between parents and children. Second, what types of motivation and learning are associated with autonomy-supportive versus controlling behaviors on the part of parents? Here, we were interested not only in the success of the dyad on learning tasks but also in the success of the children in using the learned information on their own. Thus, we were interested in whether the quality of the interaction was related

Wendy S. Grolnick, Suzanne T. Gurland, Wendy DeCourcey, and Karen Jacob, Frances L. Hiatt School of Psychology, Clark University.

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Correspondence concerning this article should be addressed to Wendy S. Grolnick, Frances L. Hiatt School of Psychology, Clark University, 950 Main Street, Worcester, Massachusetts 01610. E-mail: wgrolnick@clarku.edu

to children's abilities to generalize the information learned to a new situation.

A Self-Determination Perspective on Autonomy Support Versus Control

In this study, we used self-determination theory to conceptualize the dimension of autonomy support versus control. In this theory, individuals have innate needs for autonomy, competence, and relatedness (Deci & Ryan, 1985). These needs fuel individuals' engagement in activities and attempts to master their environments. Such activities are referred to as *intrinsically motivated.* When intrinsically motivated, people experience themselves as autonomous or choiceful. Further, even when individuals engage in a behavior for some goal other than inherent enjoyment and feelings of mastery, that is, when *extrinsically motivated*, they can be more or less autonomous in doing so.

A key aspect of the theory is that individuals will be most intrinsically motivated, and most autonomous for extrinsically motivated activities, when the environment satisfies the need for autonomy. Such an environment supports people's experiences of autonomy instead of controlling their behavior. Environmental controls are defined as events that pressure individuals to think, feel, or perform in specified ways (Deci & Ryan, 1987). Pressure undermines the experience of the self as an initiator of action, thereby undermining intrinsic motivation. By contrast, autonomy-supportive events facilitate the experience of being an initiator, or *origin*, of one's behavior, thereby facilitating intrinsic motivation.

Controls can come in tangible form, such as in the imposition of rewards, or in events such as deadlines or surveillance. Each of these has been found to undermine intrinsic motivation (e.g., Amabile, DeJong, & Lepper, 1976; Deci, 1972; Lepper & Greene, 1975). However, control can also be manifested as an interpersonal style of an individual. Deci, Nezlek, and Sheinman (1981), using a self-report instrument to assess teachers' orientations toward the control or support of autonomy of children, found that children in more autonomy-supportive classrooms were more intrinsically motivated and felt more competent and in control. Grolnick and Ryan (1989) found that children of more controlling parents were less self-regulated in school, evidenced more acting out in the classroom, and had lower achievement and grades than children of more autonomy-supportive parents.

Factors Affecting Autonomy Support Versus Control

Although much attention has been devoted to the effects of autonomy support versus control in parents, less has been dedicated to understanding *why* parents behave in a controlling or autonomy-supportive manner with their children. There has been work, however, that has examined factors associated with related dimensions of parenting such as harshness and punitiveness, which are on the controlling end of the dimension. Much of this work has focused on external pressures, which usurp the time and psychological availability crucial for autonomy-supportive behavior. For example, economic hardship has been found to be associated with more harsh (Conger, Patterson, & Ge, 1995) and punitive (Dodge, Pettit, & Bates, 1994; McLoyd & Wilson, 1991) parenting, as have stressful life events (Grolnick, Weiss, McKenzie, & Wrightmen, 1996).

One analogue study examined the effects of stress within a laboratory setting (Zussman, 1980). Mothers and fathers had to watch their young children in a room filled with potential hazards (e.g., an overflowing ashtray) under either a high-stress condition, where they had to do a mental task as well, or a low-stress condition, where there was no additional task. Parents in the high-stress condition were more critical, restrictive, and punitive toward their children than parents in the low-stress condition.

Another type of pressure that parents may experience is one that comes from within, that is, self-imposed pressure to have their children perform well. To conceptualize this concept, we draw on the literature on ego-involvement. When people are ego-involved in a task, their performance on that task has ramifications for their feelings about themselves (Nicholls, 1984; Sherif & Cantril, 1947). In other words, when ego-involved, people will feel good about themselves and proud if they perform well but bad about themselves, ashamed, and perhaps embarrassed if they perform poorly. Thus, when people are ego-involved, they focus on the self and are highly motivated to protect their self-esteem by creating a positive outcome. By contrast, when people are task involved, they engage in a task not out of a desire to show positive performance but out of interest in the task. The effects of ego-involvement on motivation have been studied by Richard Ryan. Ryan (1982) had college students solve hidden-picture puzzles in either an ego-involved (performance said to be linked to IQ) or a task-involved (no performance–IQ link) condition. He showed that ego-involvement in the task resulted in greater feelings of pressure and tension than task involvement as well as lower intrinsic motivation to pursue the tasks in a free-choice session.

In Ryan's study, participants became ego-involved when their own performance had ramifications outside of the task itself, that is, when their own performance had the potential to make them feel that they were intelligent or unintelligent. However, there are a variety of instances in which people's feelings hinge not on their own performance but on the performance of another. For example, how a student performs on a test might affect how the teacher assesses her teaching or how a child dresses might affect how the parent feels she will be judged as a parent. In these examples, teachers and parents become ego-involved in children's performance, behavior, or outcomes, and this ego-involvement is likely to influence the way teachers and parents interact with children.

Deci, Spiegel, Ryan, Koestner, and Kauffman (1982) examined a related phenomenon in an analogue study of teachers. College students were told that they would be teaching other students to solve puzzles. The "teacher" students were given one of two orientations to their task; one emphasized performance standards, stressing that teachers were "responsible for students' performing up to standards," and the other contained no specific performance requirements. Teachers in the performance standards condition talked more, let students work alone less, and used three times as many directives and "should" type statements as those in the informational condition. Winch and Grolnick (1993) in an analogue counseling situation showed that "counselors" who were ego-involved in the task of obtaining information from a "counselee" were judged to be more controlling than were task-involved counselors.

In this study, we were interested in bringing the notion of ego involvement to parenting. In particular, we were interested in whether parents' becoming ego-involved in the performance of

their children would affect their levels of autonomy support versus control with them. To ego-involve parents, we focused them on the evaluation of their children by stressing that the children would be tested on the task, by mentioning performance standards, and by suggesting parental responsibility for outcomes ("Ensure your child performs well enough"). In a second condition, there were no performance standards, and the locution deemphasized parental responsibility. In this latter condition, mothers were still made aware that their children would be asked questions later. This was done to ensure that both conditions involved a directed learning situation, that mothers in this condition would not be at a disadvantage by not knowing what was to follow, and to increase the ecological validity of the task as homeworklike.

Thus, in this study parents participated in a task with their child under either a high- or a low-pressure condition. We predicted that parents in the high-pressure condition would feel more tense and act in a more controlling manner than parents in our low-pressure condition.

Though the situation (i.e., low or high pressure) was expected to influence the behavior of mothers in working with their children, mothers undoubtedly come into the laboratory with greater or lesser tendencies to support autonomy or control behavior. Thus, we included in our study individual differences in parents that they bring into the laboratory as another influence on how they interact. Kochanska, Kuczynski, and Radke-Yarrow (1989) found that parents who endorsed more authoritarian–restrictive items (e.g., physical punishment, prohibitions) on the Block Childrearing Practices Inventory (Block, 1981) used more direct commands, physical enforcements, reprimands, and prohibitions in the lab. Endorsement of authoritative–democratic items (rational guidance, encouragement of child independence) was positively associated with the use of suggestions and negatively related to the use of enforcements, prohibitions, and direct commands. A follow-up study showed that maternal reports were still predictive of their behavior 2–3 years later (Kochanska, 1990).

As discussed, mothers' behavior in the laboratory was expected to be influenced by both situational factors and prior attitudes and styles brought into the laboratory. Mothers' behavior was also likely to be influenced by characteristics of the children. Since Bell's (1968) pioneering work, it has become clear that parents behave, at least in part, as a reaction to their children's behavior. In this study, children's abilities were likely to affect the behavior of parents. Supporting this reasoning, Pomerantz and Eaton (2001) showed that mothers reported using more controlling practices when their children were rated by teachers as performing poorly in school.

In our tasks, children's competence levels could affect mothers' behavior in at least two ways. First, in the task, children with lower ability levels could have more difficulty and thus cause their mothers to intervene more. We dealt with this in our system for coding control by taking into account the child's need for assistance. In our system, controlling behaviors were defined as those that intruded and directed beyond what the child needed. Thus, a mother who provided directions to a child who was lost was coded as less controlling than a mother who directed the child when the child was proceeding along well. This way of conceptualizing and measuring autonomy support has much in common with the concept of scaffolding (Wood, 1980). When caretakers scaffold, they tailor their levels of intervention to the capabilities of the child—decreasing them when the child is succeeding and increasing them when the child is having difficulty. In fact, Pratt, Kerig, Cowan, and Cowan (1988) found positive relations between authoritative parenting (assessed by questionnaire) and parents' use of scaffolding with their children.

Children's behavior could also affect parents through past experience with children's performance. Thus, parents of children who had trouble in schoollike tasks might try to preempt problems before they occurred. To assess this possibility, we used children's grades in school to index levels of competency in schoollike tasks. Thus, we examined whether grades in school influenced mothers' level of controlling behavior. We should note that because grades may be both a cause and a result of parental controlling behavior, controlling for this factor in multivariate analyses represents a conservative strategy.

In summary, we were interested in both situational and individual-differences effects on mothers' autonomy-supportive versus controlling behavior in a schoollike task. We also looked for possible interactions between situations and individual differences. For example, mothers who, by child report, were more autonomy supportive outside the laboratory might be less affected by our situational manipulation than those who were less extreme on this dimension.

Autonomy-Supportive Versus Controlling Environments: Relations With Learning

In addition to studying factors that affect parents' styles, we were interested in the effects of parents' levels of control versus autonomy support on children's learning. We were interested in how mothers' autonomy-supportive versus controlling behaviors might influence children's ability to apply the information they learned with their parents when they were on their own. Although no studies have looked specifically at this issue, there is a literature that links motivational conditions to types of learning. McGraw and McCullers (1979) showed that college students working with a problem-solving activity had a more difficult time "breaking set" when they were paid to work on the problems than when they were not. Grolnick and Ryan (1987) had children read social studies passages under either a controlling condition, in which they were told they would be tested, or a noncontrolling condition, in which they were told they would be asked questions about the material later but that it would not be a test. Children were equivalent in their rote recall of the material, but children in the noncontrolling condition showed superior conceptual learning (getting the main point of the passage). Further, children retained more information at a 2-week follow-up under the noncontrolling relative to the controlling condition.

These studies suggest that learning under pressured or controlling conditions undermines conceptual understanding and retention. Presumably, constraints and pressures focus children on the details of the material and narrow their attention, thus undermining deep learning. Further, information is more likely to be discarded when it is learned for a specific goal (e.g., a test) than when it is taken in more generally.

Given this, we expected that mothers' controlling behavior in our learning situation would undermine children's abilities to integrate the information they learned so that it could be used when they were on their own. Thus, we predicted that children who

experienced controlling interactions with their mothers would be less able on similar tasks when alone.

Method

Participants

Sixty mothers and their third-grade children (33 boys and 27 girls) from three public elementary schools in a medium-sized socioeconomically diverse New England city participated. Schools were chosen on the basis of their principal's interest in the project and their demographic representativeness of the school system at large. Mothers varied in their educational levels: 1 (2%) had partial high school, 7 (12%) had completed high school, 20 (33%) reported some college or other training, 19 (32%) had graduated from college, and 13 (21%) reported schooling beyond college. The mothers mostly identified themselves and their children's fathers as Caucasian (90% of mothers, 83% of fathers), with 3 mothers (5%) and 4 fathers (6%) identified as Hispanic/Latino, 1 mother (2%) and 2 fathers (3%) as Asian, 3 fathers (5%) as African American, and 1 mother as African (2%). One mother and 1 father were identified as biracial (African American/Caucasian and African American/Native American, respectively). This racial/ethnic distribution is similar to that of the school system but includes a higher percentage of Caucasian and a smaller percentage of Hispanic families. Eighty-three percent of the families were married, 3 (5%) divorced, 3 (5%) remarried, 3 (5%) single, and 1 (2%) widowed.

Procedure

Children ($N = 258$) were told about the project in their classroom groups and then given an information sheet to take home to their parents that described the project and asked for their permission to be contacted if they were interested in participating. The information sheet indicated that we were interested in learning more about how parents and children "work on schoolwork together." Two hundred fourteen (83%) of the families returned the slips. Of those returning the slips, 126 (59%) responded positively. This response rate is comparable to other studies requiring an hour-long time commitment and a visit to our laboratory by both mothers and their children. Potential participants were contacted and scheduled for a lab visit until the target of 60 families was reached. One participant was dropped from the analyses because of a language barrier and another participant was added.

When the mother and child arrived, they were told about the project together. Then an experimenter led the child to a separate room, where he or she completed a series of questionnaires, including the Parenting Context Questionnaire (Grolnick & Wellborn, 1988) described below. While the child completed questionnaires, the mother provided demographic information and filled out questionnaires with another experimenter. After this, the mother was told about the first task (map or poem, with order counterbalanced). The mother was then given a minute to familiarize herself with the task. Before the child reentered the room, the mother was given one of two experimental inductions according to her random assignment to either the high-pressure ($n = 30$) or low-pressure ($n = 30$) condition.

Mothers in the high-pressure condition were told, "Your role is to ensure that your child learns to give directions [write a poem]. We will be testing him/her after to make sure that he/she performs well enough."

Mothers in the low-pressure condition were told, "Your role is to help your child learn how to give directions [write a poem]. We will be asking him/her some questions after but there is no particular level at which he/she needs to perform."

After the experimental induction but before the child reentered the room, the mother filled out the Affect Questionnaire. This questionnaire was administered to assess parents' feelings (e.g., tension, positive affect) after the manipulation. After this, the child entered the room and the dyad completed the task. The mother and child were given as much time as they needed and were instructed to knock on the door when they had finished the task. Next, the mother left the room, and the mother and child each completed a questionnaire about their experience of doing the task (children completed the What I Thought Questionnaire; mothers, the Opinion Questionnaire). Finally, with the mother still out of the room, the child was given a new task of the same type to solve on his or her own (give directions on a map or write a quatrain poem). After this, the experimental induction was repeated (mothers received the same induction they had earlier), and the procedure was repeated with the new task (map or poem).

Map Task

Mothers and children were given a large map with several landmarks (i.e., McDonald's restaurant, a high school, a bank). They were also given a two-page handout containing task directions and several problems. The directions stated that in order to "get someone to where they are going you need to use three pieces of information: street names, the direction to go in (N, S, E, or W), and the names of the streets they need to cross over." After the directions, there were a number of problems in which the task was to fill in the missing information (for example, "to get from the Hotel to the Pizza Place, go south on Peach St. and cross over ____ Street and ____ Street"). The final question was an open-ended problem requiring the child to give directions to get Adam from the bus stop to the bank using the three pieces of information.

After the mother left the room, the child was given an open-ended problem similar to the last problem completed. The child had to provide directions for Bob to get to the grocery store. We determined the accuracy of dyadic and child responses to the open-ended questions by counting the correct pieces of information included and subtracting incorrect and omitted pieces.

Poem Task

The poem task began with a description of a quatrain (a four-lined poem with a particular rhyming pattern). Following this description, dyads were given several quatrains on which they had to identify the rhyming pattern. Finally, dyads were to write a quatrain of their own and identify the pattern they used. When they were alone, children were asked to independently write a quatrain of their own. We computed the accuracy of the children's poems by giving one point for each of having four lines, a quatrain pattern, lines appropriately labeled, and lines rhyming according to the quatrain pattern.

Questionnaire Measures

Affect Questionnaire

After being given the manipulation but before completing the task with the child, mothers completed the Affect Questionnaire. This scale was administered to determine whether mothers in the high-pressure condition had different affective reactions than those in the low-pressure condition. The scale is a checklist containing 13 mood statements (e.g., "I feel tense," "I feel happy") that participants rate on a 1 (*strongly disagree*) to 7 (*strongly agree*) scale. Items were derived from the Intrinsic Motivation Inventory (Ryan, 1982; Ryan, Mims, & Koestner, 1983). A principal-components factor analysis using oblique rotation yielded a two-factor solution by the scree criterion (Cattell, 1966). Factors of Tension (eigenvalues: 4.83 for map, 5.55 for poem) and Positive versus Negative Affect (e.g., eigenvalues: 2.05 for map, 1.57 for poem) were identified. Cronbach's alphas for the map and poem, respectively, were .82 and .88 (Tension) and .76 and .68 (Positive Affect).

Opinion Questionnaire

The mother filled out this 16-item scale once after completing the map task and once after completing the poem task with her child. Items assessed

interest–enjoyment (e.g., "How interesting did you find the worksheet you did with your child?"), pressure–tension (e.g., "I felt very pressured while doing the worksheet with my child"), and competence of self (e.g., "I am very satisfied with how I did working with my child") and of child (e.g., "I thought my child did well on this activity"). Factor analysis revealed, for the map and poem tasks, respectively, factors for Interest–Enjoyment (eigenvalues: 4.97 and 4.87) and Tension (eigenvalues: 2.08 and 1.85). Mothers' ratings of both their own and their children's competence loaded onto the same Competence factor (eigenvalues: 1.38 and 1.25). Alphas for the map and poem tasks, respectively, were .75 and .63 (Interest–Enjoyment), .81 and .75 (Tension), and .82 and .82 (Competence).

What I Thought Questionnaire

After completing each task with their mothers, children completed this 12-item scale to assess their experience during the task. Children rated items on a 1 (*very*) to 4 (*not at all*) scale. A priori subscales were Competence (e.g., "How easy did you think the worksheet was?"), Pressure–Tension (e.g., "How nervous were you when you were working on the worksheet?"), and Effort (e.g., "How hard did you try on this worksheet?"). A principal-components factor analysis using oblique rotation yielded a four-factor solution, with factors of Interest–Enjoyment, Tension, Difficulty, and Effort (eigenvalues: 4.08, 2.72, 1.31, and 0.72 for the map task and 3.93, 1.97, 1.66, and 1.12 for the poem task, respectively). Alphas for the Interest–Enjoyment and Pressure–Tension subscales were acceptable for the map and poem tasks, respectively: .90 and .86 (Interest–Enjoyment) and .81 and .73 (Pressure–Tension). However, alphas for Difficulty and Effort were below .60 and were thus dropped from further analysis.

Parenting Context Questionnaire

This 40-item questionnaire (Grolnick & Wellborn, 1988) assesses children's perceptions of their mothers' (20 items) and fathers' (20 items) autonomy support, involvement, and structure. Only the eight Maternal Autonomy Support subscale items, which were adapted for the school domain, were included in the present analyses. Autonomy support on this scale is defined as the degree to which mothers provide choice for children versus pressuring or controlling their behavior. Sample items are "When it comes to school, my mother is always telling me what to do" and "My mother allows me to decide things for myself." Each item is rated on a scale from 1 (*not at all true*) to 5 (*very true*). Cronbach's alphas for the Autonomy Support subscale have been in the .70 to .80 range in previous studies. Children of parents rated as more autonomy supportive have been found to exhibit more autonomous motivation than those of parents rated as more controlling (Grolnick & Wellborn, 1988). Cronbach's alpha for this study was .75.

Coding of Videotapes

Videotapes of the mother–child dyads working on the map and poem tasks were coded in 5-s intervals using two coding systems. One system recorded the content of the mothers' behaviors, and the other was a 5-point rating of how controlling versus autonomy supportive the mother was during the interval. For both coding systems, controlling behaviors were defined as those used by the mother to change the ongoing course of the child's activity, whereas autonomy-supportive behaviors were those used by the mother to help maintain the child's ongoing activity or encourage ongoing task-oriented behavior. To determine whether a behavior was autonomy supportive or controlling, we took all aspects of the context into account, including the child's behavior. For example, a mother who gave the child an idea for a poem would be rated as less controlling if the child asked for this information or appeared unable to come up with a topic relative to a child who was progressing on his or her own and received this suggestion. Thus, the same behavior could be coded controlling or autonomy supportive, depending on the context.

Content Codes

For each 5-s interval, 9 verbal and 10 nonverbal content codes were recorded. Multiple codes in an interval were permitted. The controlling verbal codes were directives (e.g., "Do Number 2 now"; directives also included leading questions), taking over (e.g., reading the directions for the child), telling the answers, and unsolicited checking (e.g., "I'll go over your answers").

The autonomy-supportive verbal codes were general feedback and encouragement (e.g., "Great job"), information hints, strategies (e.g., when the child left out the cross streets in giving directions, "What other information do you need?"), and solicited checking. Off-task verbalizations were also noted.

The controlling nonverbal content codes were leading behaviors (e.g., pointing to places on the map when the child was progressing adequately), taking over (e.g., writing the poem, erasing child's answers), showing the answers (e.g., showing the child the route on the map), and unsolicited checking. The autonomy-supportive nonverbal codes were waiting for the child to require assistance (this was coded only when the mother was clearly available for the child; if she was not attending to the child or task, no nonverbal code was recorded), nonverbal feedback (e.g., clapping when the child completed the task), nonverbal information (e.g., holding the child's place at his request), and solicited checking. Off-task behaviors were also recorded.

Data Reduction: Autonomy Support Versus Control Content Codes

Because dyads varied in the time they took to complete the tasks, we transformed frequencies of codes to proportions by dividing the number of intervals containing the code by the number of intervals the dyad took to complete the task. An examination of the codes indicated that several were used very infrequently. Eight codes (verbal and nonverbal solicited checking, verbal and nonverbal unsolicited checking, nonverbal feedback, verbal and nonverbal off-task behavior, and no behavior [nonverbal]) had raw means under 2 and proportions under .01 for both map and poem tasks. These codes were dropped from further analysis.

Several of our content codes were designated a priori to be autonomy supportive or controlling. To determine whether codes could be collapsed, we examined correlations among the remaining codes. The three verbal codes hypothesized to be controlling (verbal leading, verbally taking over, and verbally giving answers) were moderately intercorrelated (r = .33 to r = .53 for the poem task; r = .30 to r = .38 for the map task). The codes were thus collapsed to form a verbal control composite for each of the tasks. The three nonverbal control codes (nonverbal leading, nonverbally taking over, and nonverbally giving answers) were also intercorrelated, though not as strongly for the map task (r = .10 to r = .36) as for the poem task (r = .40 to r = .48). These codes were also collapsed. The verbal autonomy-supportive codes, on the other hand, were virtually uncorrelated and thus could not be combined, and the two nonverbal autonomy support scores were negatively correlated (availability was negatively correlated with all nonverbal scores because it represented availability for acting and was thus at odds with acting). These scores were thus analyzed separately.

Autonomy Support Versus Control Rating

In addition to coding the content of mothers' behavior and verbalizations, we gave each 5-s interval two ratings (verbal and nonverbal) on a scale from 1 (*highly controlling*) to 5 (*highly autonomy supportive*). Mothers were rated as highly controlling verbally when, for example, they fired directions at the child or gave the child multiple answers. A highly

autonomy-supportive verbal rating was given when the mother provided general feedback, reflection, or encouragement to the child. The overall rating did overlap with content codes but gave the rater flexibility to consider the degree of control in the interval.

Creativity Ratings

To assess the creativity of the poems written by the children when on their own, two raters coded each poem using Amabile's (1983) consensual assessment. Creativity was defined as "the degree to which the poem is creative, using your own subjective definition of creativity." Raters read all 60 poems and then rated on a scale from 1 to 5 each poem's level of creativity relative to the others. Raters were blind to condition and parent–child interaction styles. The intraclass correlation between raters was .73 using the Shrout–Fleiss formula.

Interrater Agreement

Two raters coded each videotape independently. After coding the interval, they discussed disagreements until a consensus code was reached. Interrater reliability for the autonomy support and control content codes prior to discussion yielded the following Cohen's kappas: for the map task, $\kappa_{verbal} = .87$, $\kappa_{nonverbal} = .86$, and $\kappa_{overall} = .87$; for the poem task, $\kappa_{verbal} = .82$, $\kappa_{nonverbal} = .85$, and $\kappa_{overall} = .84$. Shrout–Fleiss intraclass correlations for the autonomy support versus control ratings for the map task were .77 for the verbal scale and .98 for the nonverbal scale; for the poem task they were .79 for the verbal scale and .97 for the nonverbal scale.

Results

Preliminary Analyses

To determine whether there were gender differences, task differences, or interactions between gender and task, a series of repeated measures analyses of variance (ANOVAs) with one between-subjects variable (gender) and one within-subject variable (task) were conducted for all dependent variables (self-reports of mothers and children, ratings of mother behavior during the task, and child performance). There were no significant main effects for gender. Of the 17 possible Task × Gender interactions, there were only three significant effects.[1]

By contrast with the few gender effects, there were a number of differences between the map and poem tasks. Mothers were higher on the verbal control composite, $F(1, 57) = 20.91$, $p < .001$, and the nonverbal control composite, $F(1, 57) = 6.98$, $p < .01$, on the map task ($M_{verbal} = .14$, $SD = .07$; $M_{nonverbal} = .14$, $SD = .10$) relative to the poem task ($M_{verbal} = .10$, $SD = .10$; $M_{nonverbal} = .10$, $SD = .10$). Mothers were also rated as higher in overall verbal, $F(1, 57) = 10.15$, $p < .002$, and nonverbal, $F(1, 57) = 44.58$, $p < .001$, autonomy support on the poem task ($M = 3.16$, $SD = 0.54$; $M = 4.10$, $SD = 0.78$, respectively) than on the map task ($M = 2.91$, $SD = 0.46$; $M = 3.41$, $SD = 0.88$, respectively). Mothers were more available on the poem task ($M = .54$, $SD = .23$) relative to the map task ($M = .36$, $SD = .23$), $F(1, 57) = 39.25$, $p < .001$, and provided more nonverbal information ($M = .18$, $SD = .14$) and more feedback ($M = .21$, $SD = .09$) on the map task relative to the poem task ($M = .09$, $SD = .14$; $M = .18$, $SD = .09$, respectively), $F(1, 57) = 17.73$, $p < .001$. Finally, mothers reported themselves to be more competent on the poem ($M = 6.70$, $SD = 0.81$) relative to the map task ($M = 6.42$, $SD = 0.53$), $F(1, 57) = 5.81$, $p < .05$, and to feel more tension on the poem ($M = 1.84$, $SD = 0.98$) relative to the map task ($M = 1.51$, $SD = 0.87$), $F(1, 57) = 7.66$, $p < .01$. There were no significant differences in the time (number of 5-s intervals) it took dyads to complete the poem task ($M = 92.48$, $SD = 36.23$) relative to the map task ($M = 94.25$, $SD = 42.59$).

Order Effects

The map and poem tasks were counterbalanced for order. To determine whether there were order effects or whether any order effects might depend on the condition the dyad was assigned to, we conducted a series of ANOVAs with order, condition, and the Order × Condition interaction for number of intervals, mother behavior, and self-report of dyad. There were no significant order or Order × Condition effects observed. Condition effects are discussed later in the primary analysis section.

Relations Between Children's Grades and Mother Behavior

There were significant correlations between mothers' behavior in our task and children's end-of-year grades (mean of reading and math) in school in both tasks (see Table 1). In each case, higher grades were associated with lower scores on the verbal and nonverbal control composites and higher autonomy support ratings (verbal and nonverbal). Further, children's ratings of their mothers' autonomy support at home were positively correlated ($r = .32$, $p < .01$) with grades.

Primary Analyses

The goal of the study was to examine the effects of an experimental manipulation (high vs. low pressure) and the individual differences mothers and children bring to the situation on the autonomy-supportive versus controlling behavior of mothers, mothers' and children's experiences, and children's performance on two types of homeworklike tasks, a verbal poem task and a nonverbal map task. To examine these relations, we used a repeated measures analysis of covariance framework with two between-subjects variables—condition (high [$n = 30$] vs. low [$n = 30$] pressure) and mothers' styles (high [$n = 33$] vs. low [$n = 27$] autonomy support)—and task (map vs. poem) as the repeated measure. Groups for mothers' styles were created using a median split based on children's reports of their mothers' autonomy-

[1] Girls reported greater interest–enjoyment for the poem task ($M = 3.71$, $SD = 0.44$), relative to the map task ($M = 3.46$, $SD = 0.71$), whereas boys showed slightly greater interest–enjoyment of the map task ($M = 3.31$, $SD = 0.84$) relative to the poem task ($M = 3.21$, $SD = 0.78$), $F(1, 57) = 4.58$, $p < .05$. Mothers were more available on the poem task relative to the map task for boys ($M_{poem} = .51$, $SD = .26$; $M_{map} = .39$, $SD = .25$), $F(1, 57) = 5.34$, $p < .02$, but the difference between the two was even stronger for girls ($M_{poem} = .58$, $SD = .20$; $M_{map} = .32$, $SD = .20$), $F(1, 57) = 5.34$, $p < .03$. Finally, the effect for the verbal control composite indicated that mothers provided about equal amounts of control on the map and poem tasks for their boys ($M_{map} = .13$, $SD = .07$; $M_{poem} = .11$, $SD = .07$) but provided more control on the map task ($M = .14$, $SD = .07$) than the poem task ($M = .08$, $SD = .04$) for their girls, $F(1, 57) = 4.60$, $p < .03$.

Table 1
Correlations Between Children's Grades and Mother Behavior During Task

Mother behavior	Poem	Map
Verbal		
Control composite	−.38**	−.45***
Information	−.23†	−.20
Feedback	.10	.02
AS rating	.33**	.33**
Nonverbal		
Control composite	−.33**	−.33**
Information	−.29*	.05
Availability	.48***	.35**
AS rating	.37**	.34**

Note. AS = autonomy support.
† $p < .10$ (marginally significant). * $p < .05$. ** $p < .01$. *** $p < .001$.

supportive versus controlling styles at home.[2] Given the significant relations between mothers' behavior and children's grades, grades (mean of reading and math) were entered as the covariate. To determine whether individual differences brought to the lab might moderate the effects of condition, the interaction between condition and mothers' autonomy supportive styles was also included. Because task differences were discussed in the *Preliminary Analyses* section, they are not repeated here. Means and sample sizes for condition and autonomy support groups for all dependent variables are depicted in Table 2.

Mothers' Verbal Behavior

Condition. There were no significant effects of condition on verbal content codes, but there was a significant cross-task effect for the overall verbal rating, $F(1, 53) = 3.80$, $p < .05$ (see Table 3). This main effect for the overall verbal autonomy support rating, however, was qualified by a Task × Condition interaction, $F(1, 53) = 4.37$, $p < .05$. ANOVAs for the two tasks separately indicated that there was a significant effect of condition in the poem task, $F(1, 58) = 7.04$, $p < .01$, but not in the map task, $F(1, 58) = 0.08$, $p > .05$. The condition effect for the poem task indicated that mothers in the low-pressure condition ($M = 3.34$, $SD = 0.55$) were more verbally autonomy supportive than mothers in the high-pressure condition ($M = 2.97$, $SD = 0.47$). A marginal Task × Condition × Style interaction also emerged for the overall verbal rating, but closer analysis yielded no significant effects.

Maternal style. The styles mothers brought into the laboratory affected their verbal behavior during the tasks. Specifically, there were significant cross-task effects of maternal style for the verbal control composite, $F(1, 53) = 3.95$, $p < .05$, and for the overall verbal autonomy support rating, $F(1, 53) = 8.71$, $p < .01$, in each case with autonomy-supportive mothers lower in control ($M = .11$, $SD = .05$) and higher in verbal autonomy support ($M = 3.20$, $SD = 0.41$) during the task than stylistically controlling mothers ($M = .14$, $SD = .05$, and $M = 2.83$, $SD = 0.35$, respectively). Further, there was a marginally significant effect for verbal information, $F(1, 53) = 2.86$, $p < .10$, with stylistically more autonomy-supportive mothers providing less verbal information ($M = .14$, $SD = .05$) than those low on this variable ($M = .17$, $SD = .07$).

Child competence. Children's competence, as measured by grades, also contributed to mothers' verbal behavior during the tasks. Across tasks, there were main effects for the verbal control composite, $F(1, 53) = 10.39$, $p < .01$, and for the overall verbal rating, $F(1, 53) = 4.60$, $p < .05$, with mothers of more competent children using more autonomy-supportive (less controlling) verbalizations than those of less competent children.

Mothers' Nonverbal Behavior

Condition. There were no main effects of condition for mothers' nonverbal behavior during the tasks.

Maternal style. The styles mothers brought into the laboratory did indeed affect their nonverbal behavior in the tasks. Specifically, stylistically autonomy-supportive mothers were lower on the nonverbal control composite ($M = .08$, $SD = .06$), $F(1, 53) = 7.10$, $p < .01$, higher in availability ($M = .53$, $SD = .17$), $F(1, 53) = 7.59$, $p < .01$, and rated as higher in nonverbal autonomy support ($M = 4.00$, $SD = 0.63$), $F(1, 53) = 6.37$, $p < .05$, than stylistically more controlling mothers ($M = .14$, $SD = .08$; $M = .36$, $SD = .19$; and $M = 3.44$, $SD = 0.71$; respectively).

In addition, there were two three-way interactions (Task × Condition × Style). For the effect for the nonverbal control composite, ANOVAs conducted separately by task indicated that for the map task there was a strong effect of condition for mothers who were stylistically controlling, with those in the high-pressure condition ($M = .23$, $SD = .09$) significantly higher than those in the low-pressure condition ($M = .14$, $SD = .08$), $F(1, 53) = 14.82$, $p < .001$. However, there did not appear to be an effect of condition for mothers high in autonomy support ($M_{\text{high pressure}} = .10$, $SD = .08$; $M_{\text{low pressure}} = .13$, $SD = .10$). By contrast, in the poem task, no such interaction emerged, $F(1, 53) = 1.81$, $p > .10$.

Regarding the three-way interaction for overall nonverbal autonomy support, $F(1, 53) = 9.94$, $p < .01$, analyses conducted by task revealed a significant Condition × Maternal Style interaction in the map task, $F(1, 53) = 4.15$, $p < .05$, but not in the poem task, $F(1, 53) = 1.45$, $p > .10$. Specifically, in the map task, stylistically controlling mothers were highly affected by the condition, showing less autonomy support in the high-pressure condition relative to the low-pressure condition ($M_{\text{high pressure}} = 2.67$, $SD = 0.75$; $M_{\text{low pressure}} = 3.41$, $SD = 0.71$). Stylistically autonomy-supportive mothers were not similarly affected ($M_{\text{high pressure}} = 3.78$, $SD = 0.82$; $M_{\text{low pressure}} = 3.55$, $SD = 0.94$).

Child competence. There were several effects of children's competence levels on mothers' nonverbal behavior during the tasks. The lower children's grades were, the less available mothers made themselves, $F(1, 53) = 9.92$, $p < .01$, and the more controlling they were rated, $F(1, 53) = 5.00$, $p < .05$. There was also a trend for mothers of less competent children to be rated as more controlling overall, $F(1, 53) = 3.84$, $p < .06$.

[2] The high and low autonomy-support groups did not differ significantly on marital status, number of children, or ethnic or gender distribution. The two groups did differ significantly on mothers' years of education, with the high autonomy-support group somewhat more educated ($M = 15.21$, $SD = 2.76$) than the low autonomy-support group ($M = 13.37$, $SD = 2.47$), $t(58) = 2.69$, $p < .05$.

Table 2
Means (and Standard Deviations) by Condition and Maternal Autonomy Support

Variable	Low pressure		High pressure	
	High maternal autonomy support (n = 16)	Low maternal autonomy support (n = 14)	High maternal autonomy support (n = 17)	Low maternal autonomy support (n = 13)
		Poem task		
Verbal				
Control composite	.07 (.05)	.11 (.07)	.11 (.06)	.13 (.05)
Information	.15 (.08)	.17 (.09)	.16 (.08)	.20 (.07)
Feedback	.20 (.10)	.18 (.08)	.19 (.08)	.15 (.09)
AS rating	3.55 (0.58)	3.10 (0.42)	3.06 (0.54)	2.83 (0.31)
Nonverbal				
Control composite	.03 (.03)	.11 (.12)	.07 (.07)	.10 (.08)
Information	.08 (.13)	.14 (.22)	.05 (.04)	.11 (.10)
Availability	.68 (.21)	.47 (.27)	.56 (.18)	.43 (.22)
AS rating	4.56 (0.37)	3.85 (0.88)	4.12 (0.79)	3.74 (0.83)
Self-report indices				
AQ–Positive	5.37 (0.65)	5.66 (0.67)	5.66 (0.65)	5.52 (0.97)
AQ–Pressure	2.51 (1.02)	2.85 (1.19)	1.74 (0.73)	2.75 (1.24)
WIT–Enjoyment	3.45 (0.57)	3.46 (0.64)	3.35 (0.94)	3.52 (0.54)
WIT–Tension	1.50 (0.78)	1.96 (1.06)	1.38 (0.54)	1.88 (0.92)
OP–Competence	6.63 (0.52)	6.77 (0.35)	6.66 (0.51)	6.33 (0.89)
OP–Enjoyment	5.94 (0.56)	6.07 (0.75)	6.19 (0.73)	6.00 (0.81)
OP–Tension	1.66 (0.74)	2.10 (1.27)	1.62 (0.66)	2.08 (1.21)
Performance				
Dyadic accuracy	10.81 (0.40)	10.71 (0.47)	10.88 (0.33)	10.08 (1.71)
Child alone accuracy	9.56 (2.66)	9.86 (2.35)	9.24 (2.17)	8.31 (3.54)
Poem creativity	3.75 (1.39)	3.14 (1.29)	3.53 (1.33)	2.54 (0.78)
		Map task		
Verbal				
Control composite	.12 (.07)	.15 (.07)	.11 (.07)	.18 (.05)
Information	.13 (.07)	.17 (.09)	.13 (.06)	.17 (.08)
Feedback	.22 (.08)	.20 (.08)	.22 (.09)	.20 (.11)
AS rating	3.05 (0.53)	2.81 (0.40)	3.13 (0.42)	2.61 (0.28)
Nonverbal				
Control composite	.12 (.10)	.14 (.08)	.09 (.08)	.23 (.09)
Information	.15 (.11)	.25 (.18)	.17 (.14)	.15 (.09)
Availability	.43 (.25)	.31 (.21)	.45 (.22)	.20 (.16)
AS rating	3.55 (0.94)	3.41 (0.71)	3.78 (0.82)	2.67 (0.75)
Self-report indices				
AQ–Positive Affect	5.45 (0.56)	5.81 (0.55)	5.78 (0.76)	5.34 (0.99)
AQ–Tension	2.40 (0.95)	2.63 (1.10)	1.76 (0.67)	2.51 (1.03)
WIT–Enjoyment	3.32 (0.64)	3.39 (0.81)	3.26 (1.01)	3.60 (0.57)
WIT–Tension	1.34 (0.60)	1.93 (1.09)	1.47 (0.54)	1.88 (0.94)
OP–Competence	6.90 (0.22)	6.70 (0.61)	6.84 (0.25)	6.50 (0.91)
OP–Enjoyment	6.09 (0.88)	6.00 (1.02)	6.43 (0.91)	6.19 (0.67)
OP–Tension	1.47 (0.98)	1.75 (0.80)	1.16 (0.37)	1.79 (1.14)
Performance				
Dyadic accuracy	0.92 (0.10)	0.85 (0.15)	0.96 (0.07)	0.88 (0.11)
Child alone accuracy	0.79 (0.17)	0.86 (0.17)	0.78 (0.22)	0.65 (0.22)

Note. AS = autonomy support; AQ = Affect Questionnaire; WIT = What I Thought Questionnaire; OP = Opinion Questionnaire.

Self-Report Ratings

There were no condition effects for mothers' or children's self-reports. Mothers stylistically high in autonomy support, however, reported feeling less tension following the experimental manipulation (M = 2.09, SD = 0.86) than did mothers low in autonomy support (M = 2.69, SD = 1.06), $F(1, 53) = 6.05$, $p < .05$, and similarly reported feeling marginally less pressure (M = 1.47, SD = 0.62) during the tasks than those low in autonomy support (M = 1.93, SD = 0.92), $F(1, 53) = 3.54$, $p < .07$. Further, the lower children's grades were, the more mothers reported feeling pressure during the completion of tasks, $F(1, 53) = 6.41$, $p < .05$.

Task Performance

In the study, children initially performed each task together with their mothers and later alone. We standardized measures prior to conducting the analyses to be consistent across tasks (see Table 2).

Table 3
F Values (df = 1, 55) for Repeated Measures Analyses of Covariance

Variable	Condition	Mother autonomy support	Condition × Autonomy Support	Task	Task × Condition	Task × Autonomy Support	Task × Condition × Autonomy Support	Grades (covariate)
Verbal								
Control composite	1.46	3.95*	0.01	19.47***	2.47	0.20	2.44	10.39**
Information	0.09	2.86†	0.02	1.98	0.52	0.57	0.07	2.13
Feedback	0.35	1.44	0.19	5.36*	1.01	0.13	0.06	0.00
Autonomy support rating	3.80*	8.71**	0.03	9.68**	4.37*	0.17	3.12†	4.60*
Nonverbal								
Control composite	1.10	7.10**	0.67	40.45***	0.50	1.43	14.82**	3.84*
Information	1.91	1.81	1.30	16.79***	0.06	0.16	1.22	0.96
Availability	0.69	7.59**	0.04	32.87***	0.20	0.34	3.34†	9.92**
Autonomy support rating	1.30	6.37*	0.37	38.70**	0.00	0.21	9.94**	5.00*
Self-report indices								
AQ–Positive Affect	0.00	0.01	2.93†	0.46	1.28	0.71	1.81	0.00
AQ–Tension	2.31	6.05*	1.69	2.44	0.21	0.58	0.11	0.45
WIT–Enjoyment	0.01	0.41	0.31	0.40	0.27	0.39	0.12	0.16
WIT–Tension	0.38	2.71†	0.34	0.07	0.76	0.04	0.32	6.41**
OP–Enjoyment	1.64	0.00	0.16	1.33	0.49	0.53	0.12	2.56
OP–Tension	0.27	3.54†	0.11	6.75*	0.08	0.04	0.58	0.39
OP–Competence	1.46	1.25	1.23	1.06	0.05	1.48	0.68	1.35
Performance indices[a]								
Dyadic accuracy	0.12	6.18*	0.77	0.00	3.25	0.00	1.39	5.88*
Child alone accuracy	4.27*	0.28	2.56	0.00	0.62	0.28	0.86	15.36***

Note. AQ = Affect Questionnaire (completed by mothers); WIT = What I Thought Questionnaire (completed by children); OP = Opinion Questionnaire (completed by mothers).
[a] Performance indices were standardized before the analysis was conducted.
† $p < .10$ (marginally significant). * $p < .05$. ** $p < .01$. *** $p < .001$.

Condition. When left to complete the tasks alone, children whose mothers had been in the high-pressure condition (M_{poem} = 8.83, SD = 2.83; M_{map} = 0.71, SD = 0.22) did not perform as well as children of mothers in the low-pressure condition (M_{poem} = 9.70, SD = 2.48; M_{map} = 0.82, SD = 0.17), $F(1, 53) = 4.27$, $p < .05$. It is interesting to note that there was no condition effect on performance when the mother and child worked together.

Maternal style. There was a significant effect of maternal style on dyadic task performance, $F(1, 53) = 6.18$, $p < .05$, with dyads including more autonomy-supportive mothers (M_{poem} = 10.85, SD = 0.36; M_{map} = 0.94, SD = 0.09) performing better than dyads with less autonomy-supportive mothers (M_{poem} = 10.41, SD = 1.25; M_{map} = 0.86, SD = 0.13).

Child competence. There were significant effects of children's competence for task performance, both when dyads completed the tasks together, $F(1, 53) = 5.88$, $p < .05$, and when children completed them alone, $F(1, 53) = 15.36$, $p < .001$. In both cases, these effects were in the predicted direction: The higher children's grades were, the better they performed.

Finally, poems written by the children when alone were rated for level of creativity. An ANOVA analysis revealed only an effect of grades: The higher children's grades were, the more creative were their poems, $F(1, 58) = 8.55$, $p < .01$.

Relations Between Autonomy Support Versus Control in the Task and Children's Performance

To determine whether mothers' behavior during the tasks was related to children's performance on the tasks, we conducted correlations as well as partial correlations controlling for children's grades (see Table 4). Several control indices were related to children's performance when alone, even after we controlled for children's competence. Mothers who were lower on the nonverbal control composite and were rated higher in nonverbal autonomy support had children who wrote more accurate poems alone, even after we controlled for children's grades. Further, mothers lower on the verbal control composite, lower on the nonverbal control composite, more available, and higher in verbal and nonverbal autonomy support had children who wrote more creative poems, even after we controlled for children's grades.

On the map task, there was one significant correlation between mother behavior and dyadic accuracy after we controlled for children's grades. Dyads in which mothers were more controlling were less accurate in completing the task together. There were no significant relations between mothers' levels of control and children's accuracy in solving map problems on their own (see Table 4).

Discussion

The goals of this study were twofold: to examine the effects of ego involvement on mothers' styles of interacting with their children on schoollike tasks and to examine relations between these interactions and children's abilities to learn schoollike information successfully. Two schoollike tasks, a poem task and a map task, were examined in this study.

Using the ego-involvement literature, we constructed two conditions: a high-pressure condition, which stressed evaluation, performance standards and parent responsibility, and a low-pressure

Table 4
Correlations Between Mothers' Behavior During Task and Children's Performance (Partialing Grades)

	Poem task			Map task	
Mother behavior	Dyadic accuracy	Child alone accuracy	Creativity	Dyadic accuracy	Child alone accuracy
Verbal					
Control composite	−.10 (.06)	−.25* (.09)	−.25* (−.28*)	−.04 (−.20)	.04 (.02)
Information	−.08 (−.04)	−.15 (−.05)	−.04 (.07)	−.08 (−.01)	−.14 (−.10)
Feedback	.10 (.09)	.06 (.01)	.19 (.16)	−.06 (−.08)	.07 (.07)
AS rating	.01 (−.05)	.13 (−.04)	.38** (.27*)	.26* (.15)	−.05 (−.14)
Nonverbal					
Control composite	−.27* (−.22*)	−.40** (−.29*)	−.31* (−.19)	−.30* (−.27*)	−.06 (.17)
Information	−.21 (−.17)	.03 (.20)	−.00 (.14)	.15 (−.01)	.15 (−.10)
Availability	.28* (.22)	.30* (.09)	.37** (.20)	.23 (.11)	−.05 (−.16)
AS rating	.29* (.24†)	.38** (.25*)	.39** (.27*)	.25* (.14)	.01 (−.08)

Note. AS = autonomy support.
† $p < .10$ (marginally significant). * $p < .05$. ** $p < .01$.

condition that did not. We expected that the high-pressure condition would lead to more controlling behavior on the part of mothers. There was some support for our hypothesis, but the results differed somewhat for our two tasks.

For the poem task, there was direct support for our hypothesis. Mothers in the high-pressure condition were rated as more controlling verbally than those in the low-pressure condition. These findings support the idea that despite that dyads have a history of working together on tasks, the orientation under which parents work with their children affects their interaction styles. In particular, when parents are invested in their children doing well on a test, they provide more controlling behavior to their children. Such results underscore the need for teachers and others who work with families to be sure that parents have an orientation to working with their children that does not focus excessively on evaluation and performance standards.

The map task showed a different pattern of results. Although there were no significant main effects for condition, there were significant interactions between condition and individual differences. In particular, the interactions indicated that the manipulation particularly influenced mothers who came into our session with controlling styles. Controlling mothers in the high-pressure condition used more controlling interventions and were rated as more controlling in their nonverbal behavior than mothers in any of the other three groups. Autonomy-supportive mothers did not appear to be vulnerable to our manipulation. In fact, although not significantly more, autonomy-supportive mothers were somewhat more autonomy supportive in the high-pressure condition than in the low-pressure condition.

What would account for the lack of vulnerability of high autonomy-supportive mothers to our manipulation? One possible explanation is that because they are attuned to their children's needs, they are less susceptible to environmental influences when working with them. This finding is reminiscent of work on motivational orientations showing that relative to individuals with orientations toward control, individuals who are more autonomous are more consistent in their behavior across situations (Koestner, Bernieri, & Zuckerman, 1992) and less susceptible to false feedback about themselves (Bober & Grolnick, 1995). Because autonomous parents tend to use more autonomy-supportive parenting interventions with their children (Grolnick & Gurland, 2001), the autonomy-supportive parents in our study may be more autonomous individuals and thus less susceptible to environmental influences.

What could account for the different findings in the map and poem tasks? One obvious difference between the two tasks is that the map is a more nonverbal task and the poem a more verbal task. Supporting this account, mothers used more verbal interventions (autonomy supportive and controlling) on the poem task and more nonverbal interventions on the map task. Not surprisingly then, there were more effects for our verbal variables in the poem task and for nonverbal variables in the map task.

A second difference is that the map task pulled for more controlling behavior by mothers than did the poem task. The task-specific nature of levels of control has been identified in other studies (e.g., Pomerantz & Ruble, 1998), and such differences may provide a clue to our pattern of results. We suggest that because the map task was a more structured task with easily identifiable correct and incorrect answers, it may have been easier for mothers to stay with their typical styles. The poem task, which is less structured and perhaps more novel for our families, may have made all mothers more vulnerable to the manipulation. Of course, these differences were not predicted, and our explanation is only speculative. A further understanding of the effects of orientations on different types of tasks awaits future exploration.

One interesting finding was that whereas there were effects of condition on mothers' behavior, there were no effects of condition on mothers' reported tension. This is at odds with research showing that when individuals are ego-involved in their own performance, they experience high levels of pressure and tension. However, it is consistent with two other studies in which individuals were ego-involved in the performance of others. In the study conducted by Deci et al. (1982), "teachers" given performance standards behaved in a more controlling manner toward their "students" but did not report feeling greater pressure than those in a no-standard condition. Winch and Grolnick (1993) also found behavioral, but not self-report, differences in their counseling analogue study. Given these consistent findings, we suggest that

processes are different when one is ego-involved in the performance of self versus another. When one is ego-involved in the performance of another, one can translate that involvement into controlling behavior. By controlling the other, one can act to create the outcomes one is concerned about. This may actually alleviate feelings of pressure and tension.

One antecedent to mothers' behavior in the laboratory was the children's history of academic competence, as measured by grades. As expected, mothers of children with poorer grades were more controlling and less autonomy supportive during the schoollike tasks. It is important to remember when considering these results that maternal behavior in the current study was not coded as controlling unless the mother directed children's behavior in excess of the child's demonstrated need. Thus, mothers of children with lower grades were more controlling than was warranted by the child's behavior during the task. These results suggest that mothers of children who have poorer grades may feel they need to push and control their children in order to have them succeed in schoollike tasks. This is consistent with the work of Pomerantz and Eaton (2001) that showed that mothers of children with lower grades reported higher levels of controlling behavior. Though understandable, such behavior may be counterproductive. There is evidence that controlling interventions undermine children's motivation at all competency levels and that children with learning difficulties are less intrinsically motivated and more likely to see powerful others as in control of their school outcomes than children who perform more competently in school (Grolnick & Ryan, 1990). Frustration and lack of alternative strategies may make parents more controlling with their less competent children. Such an interpretation calls for schools to help parents develop strategies for working with their children.

As expected, the styles mothers brought into the laboratory strongly affected their behavior during the tasks. For the most part, mothers whose children described them as more controlling were observed to be more controlling, both verbally and nonverbally, in our tasks, even after we controlled statistically for children's grades. As Kochanska and colleagues (1989) have shown, parents come into the laboratory with greater or lesser tendencies to support autonomy or control behavior, and they behave in accordance with these tendencies. The current results demonstrate the validity of our task situation in eliciting mothers' behavior on schoollike tasks. Such individual differences in autonomy support to control may result from mothers' beliefs about parenting, their own stress levels, their own perceptions of competence, or other factors.

We now turn to analyses of children's performance on our tasks. Although it is true that children whose mothers were in the high-pressure condition did not perform as well on the map task when alone, we were most interested in exploring the contribution of children's school competence and mothers' behavior during the task to children's performance.

First, as expected, grades did indeed contribute to performance. Children with higher grades in school wrote more accurate and creative poems when they were on their own and provided more correct information on the map task with their mothers. This finding lends support to the ecological validity of the tasks as similar to those that a third-grade student might bring home as homework.

More central to our investigation was the question of whether mothers' behavior during the tasks would be related to children's task performance. Indeed, mothers who were higher on the control composite had children who performed more poorly on the dyadic tasks, even after we controlled for children's grades. Perhaps most pertinent, again controlling for children's grades, mothers who were lower on the control composite and who were rated as more autonomy supportive during the interactional poem task had children who, when left to work alone, produced more accurate poems. Consistent with self-determination theory, this finding suggests that when children are afforded the opportunity to explore and master the task without undue interference, they are more likely to internalize what they learn than when they are controlled. Whereas children of mothers who controlled them during the task gained perhaps only a surface understanding, the children whose autonomy was supported actually achieved greater conceptual understanding of the task and were therefore more able to apply these concepts when they were alone. This is consistent with the findings of Grolnick and Ryan (1987), who found greater conceptual learning among children in a no-pressure as compared with a pressuring condition.

Mothers who, on a variety of indices, were more autonomy supportive during the task had children who wrote more creative poems. This effect, too, remained even after children's grades were partialed out. Thus, the creativity of the children's poems can be understood not only as a function of their scholastic ability but as a function of their mothers' situational autonomy support versus control. We suggest that when parents value children's suggestions and encourage children in the direction the children choose, the children may later trust their ideas more and feel freer to express themselves creatively, whereas their peers whose ideas were vetoed and who were given ideas by their mothers may have doubted their ideas or felt inhibited in their expression. Further, controlling behavior on the part of mothers may tend to focus the children's attention quite narrowly. If this narrowed attention persists when the task is performed alone, it might explain why these children have more trouble thinking divergently or "outside the box." Such an explanation is consistent with McGraw and McCullers's (1979) finding that college students had a harder time "breaking set" when they were subject to the controlling effects of a monetary reward than when they were free of such control. The finding is also consistent with studies on creativity that showed that children exposed to controlling limits painted less creative pictures than those exposed to more autonomy-supportive limits (Koestner, Ryan, Bernieri, & Holt, 1984) and that college students led to believe their work would be evaluated produced less creative artwork than their nonevaluated peers (Amabile, 1983).

Contrary to our predictions, the map task did not show the same relations between mothers' task behavior and children's performance. Indeed, none of the indices of autonomy support versus control during the map task evidenced a significant relation to children's accuracy when they performed the task alone. Although, as suggested earlier, the two tasks were different in several ways (e.g., mothers were more controlling overall on the map task), the findings may be understood as a problem of restricted range. The distribution of accuracy scores was quite skewed, with a mean proportion of .77 and a modal perfect score of 1. In addition, it may be that control has less effect on highly structured tasks with clear-cut answers. This interpretation is consistent with the differ-

ential effects of control on algorithmic and heuristic tasks discussed by McGraw and McCullers (1979).

In sum, the findings of our study support the importance of both individual differences in mothers and situational sets in predicting autonomy support in mothers. In particular, we identified ego-involvement as a motivational factor that might influence parents' levels of autonomy support versus control. We demonstrated that when mothers are ego involved in their children's performance, they act in a more controlling manner. Further, some mothers, particularly those who have more controlling styles, appear to be more vulnerable to situational effects than others. Finally, our findings extend those on controlling environments beyond learning per se to include the internalization of information.

We note several limitations of our study. Though we attempted to use tasks that were schoollike, we acknowledge that mothers' behavior in the laboratory may differ from that in the home. By observing mothers in the laboratory, we render them all involved, and of course this may be a key variable on which mothers vary. Further, this study examined only one dimension of maternal behavior, that of autonomy support versus control. Undoubtedly, there are other key dimensions along which mothers vary, including the quality of the assistance they provide. Finally, our study involved largely mothers and children of a European American background. It remains to be studied whether ego-involvement affects mothers of different cultural groups differently or whether the tasks used might be differently interpreted by a diverse set of mothers. Despite these limitations, the results of our study underscore the relevance of the dimension of ego-involvement in work on parenting and suggest that this is an area ripe for exploration.

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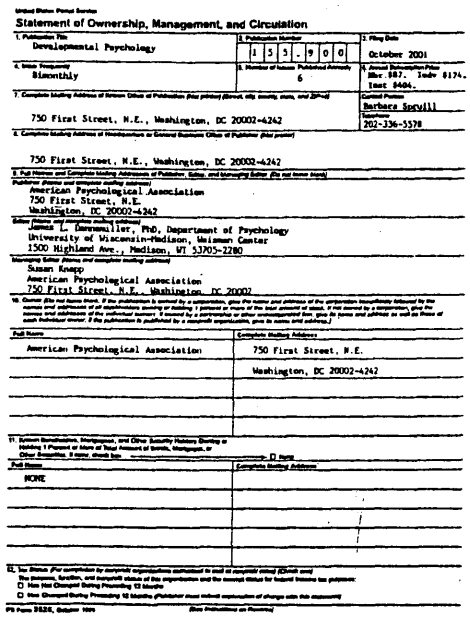

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