A Longitudinal Study of the Relationship of Maternal Autonomy Support to Children's Adjustment and Achievement in School

Mireille Joussemet
Université de Montréal
Richard Koestner, Natasha Lekes, and Renée Landry
McGill University

ABSTRACT A longitudinal study examined the relations of maternal autonomy support to children's school adjustment. Autonomy support and other parenting dimensions were measured when children were 5 years old. School measures were teacher-rated academic and social adjustment and achievement in reading and math in grade 3. Regression analyses controlling for age 5 family and child factors (e.g., socioeconomic status [SES], kindergarten adjustment, IQ) revealed that autonomy support was positively related to grade 3 adjustment (social and academic) and reading achievement. Maternal emphasis on school performance

Mireille Joussemet, Department of Psychology; Richard Koestner, Department of Psychology; Natasha Lekes, Department of Psychology (now at the Academy for Educational Development); Renée Landry, Department of Psychology.

This research used the Patterns of Child Rearing, 1951–1952 data set (made accessible in 1979, raw and machine-readable data files). These data, collected by R. Sears, E. Maccoby, and H. Levin in 1951 and by D. McClelland, C. Constantian, and D. Pilon in 1978, are available through the archives of the Henry A. Murray Research Center of Radcliffe College, Cambridge, Massachusetts. The present study was supported in part by a doctoral training grants from the Social Science and Humanities Research Council of Canada (SSHRC) and from the Fonds pour la Formation de Chercheurs et l'Aide à la Recherche (FCAR), Québec.

Correspondence concerning this article may be addressed to Mireille Joussemet Université de Montréal, C.P. 6128, succ.centre-ville, Department of Psychology, Montréal (Québec), Canada, H3C 3J7. Electronic mail may be sent to m.joussemet @umontreal.ca.

Journal of Personality 73:5, October 2005

DOI: 10.1111/j.1467-6494.2005.00347.x

was positively related to achievement measures but negatively related to social adjustment. Maternal use of rewards and praise was unrelated to grade 3 school measures. Finally, supplemental analyses revealed that autonomy support was associated with greater consistency in children's adjustment across social and academic domains as well as higher overall adjustment. These results highlight the developmental significance of parental autonomy support in early childhood.

The way children adapt academically and socially to early grade school is highly predictive of their later adaptation (Cowen et al., 1996). Indeed, early school failure has been shown to set in motion a sequence of academic, social, and emotional difficulties that compromises individuals' capacities to develop into healthy teenagers and young adults (Levine & Perkins, 1997). All parents are eager to facilitate their young children's successful transition to grade school, yet many are uncertain about what form their involvement should take. For example, many parents wrestle with whether to intervene directly to control their children's behaviors (by offering rewards, for example) or simply to provide structure and demonstrate empathy for their children's socialization experiences. The present study used a prospective longitudinal data set to examine the relation of early experiences of parental autonomy support on children's academic and social adjustment in third grade.

The study is based in self-determination theory (SDT; Deci and Ryan, 1985, 1991, 2000), which posits that humans have a basic, psychological need for autonomy (along with relatedness and competence), and to the extent that this need is satisfied in the social environment, it will facilitate individuals' internalization, well-being, and even their health (Deci and Ryan, 2000). Autonomy refers to feeling as if one is the origin of one's own actions, that one has input into determining one's own behavior. Social environments support autonomy when they provide choices, encourage self-initiation, and promote full internalization. Children's autonomous internalization of values and guidelines are thought to require (a) acknowledging their perspective and feelings, (b) providing a meaningful rationale, (c) avoiding controlling language, and (d) offering choices. Autonomy support has been operationalized by these four elements in previous studies (Deci, Eghrari, Patrick, & Leone, 1994; Joussemet, Koestner, Lekes, & Houlfort, 2004; Koestner, Ryan, Bernieri, & Holt, 1984).

The positive impact of autonomy support on interest, performance, and adjustment has been demonstrated in various domains, particularly education (see Ryan, 1995; Vallerand, 1997; Deci & Ryan, 2000, for reviews). For example, studies showed that teachers' autonomy support positively influences children's motivation, feelings of competence, and actual performance in class (e.g., Deci, Nezlek, & Sheinman, 1981; Ryan & Connell, 1989; Ryan & Grolnick, 1986). Other studies have shown links between mothers' autonomy support and intrinsic motivation in their children, even in their infants (Deci, Driver, Hotchkiss, Robbins, & Wilson, 1993; Grolnick, Frodi, & Bridges, 1984). A recent study showed that maternal autonomy support was associated with better performance on a homework-like task (Grolnick, Gurland, DeCourcey, and Jacob, 2002). By contrast, a growing body of research has revealed negative effects for parental psychological control (which represents the opposite of autonomy support) on various aspects of children's adjustment (see Barber, 2002, for a review). The construct of psychological control has received renewed scientific attention since Steinberg (1990; Steinberg, Elmen, & Mounts, 1989) noted how it differs from behavioral control (or structure) and how it relates negatively to children's school success.

Experiences of autonomy support in the family context can spill over to promote successful adaptation in the school context. For example, Grolnick, Ryan, and Deci (1991) showed that parental autonomy support, as rated by children, was positively associated with children's self-esteem, sense of competence, and achievement at school. Grolnick and Ryan (1989) further showed that autonomy-supportive parenting relates to children's adjustment and competence in school even when parent and school measures are assessed separately. Parents of children in grades 3 to 6 were interviewed about how they motivate their children to do such things as homework, cleaning one's room, and going to bed on time. Results revealed that children whose parents were autonomy supportive reported better self-regulation and performed better on objective achievement indexes. Parental autonomy support was also associated with teachers' reports of behavioral adjustment.

Present Study

Grolnick and Ryan's (1989) study was the first to demonstrate directly the link between parental autonomy support and children's

adjustment at school. The purpose of the present study was to build on this work to examine the relations between maternal autonomy support and children's adjustment over time. We analyzed data from Sears, Maccoby, and Levin's (1957) classic study of parenting influences on child behavior. This archival data set contains interviews of mothers when their children were 5 years old and teacher ratings in kindergarten, as well as teacher ratings of these children's adjustment 3 years later, in third grade. We were thus able to replicate and extend Grolnick and Ryan's work (1989) by examining children of younger ages, over a 3-year period.

Following Grolnick and Ryan's (1989) study, we coded maternal autonomy support from interviews about childrearing.[1] The selected interview sections were about motivating children to engage in desirable behaviors and follow rules at home. Our component subscales were the four autonomy support "ingredients" (Koestner et al., 1984), that is, rationale for requests, empathy, choice, and noncontrolling language. These behavioral components of autonomy support have been shown in experimental studies to promote integrated internalization of desired norms and behaviors (Deci et al., 1994; Joussemet et al., 2004; Koestner et al., 1984) and, together, they are comparable to Grolnick and Ryan's (1989) autonomy-oriented techniques and nondirectiveness subscales.

In addition to autonomy support, we also examined the relations of other motivational factors to child adjustment. Specifically, the Sears et al. (1957) data set included information about mothers' use of rewards and praise, as well as their investment in their child's performance at school. Behaviorist approaches to parenting highlight the importance of rewards and praise in the socialization of children (e.g., Eisenberger and Cameron, 1996), and parental values about school achievement have been associated with children's higher school achievement (e.g., Georgiou, 1996; Marchant, Paulson, & Rothlisberg, 2001; Steinberg, Lamborn, Dornbush, & Darling, 1992).

Stressing the importance of doing well may convey more than the importance of education, and to the extent that it conveys pressure,

1. Only maternal autonomy support was coded since fathers were not interviewed in the Sears et al. (1957) study. Our analyses will be limited to the primary caregiver, but Grolnick and Ryan (1989) found nearly identical results for parental and maternal autonomy support.

maternal investment in the child's performance could have detrimental effects on children's adjustment (Deci and Ryan, 1985, 1991, 2000). For example, Georgiou (1996) identified six forms of parental involvement in children's education and found that pressure was the only one that was negatively correlated with school achievement. Similarly, when Steinberg and colleagues (1992) studied how involvement interacts with authoritativeness (a democratic and autonomy-supportive parenting style), they found that though there was a positive relation between involvement and adolescents' academic achievement, this relation was weaker when parents were controlling.

The school measures that we focused on roughly matched those used in Grolnick and Ryan's (1989) study. Children's social and academic adjustment was evaluated by their third grade teachers, and standardized test scores in math and reading provided objective measures of their academic achievement. We hypothesized that maternal autonomy support at age 5 would be associated with better social and academic behaviors at age 8, as well as with greater academic achievement. These effects were expected to remain significant after controlling for several child factors that could possibly act as third variables responsible for the relation between autonomy support and later adjustment. Thus, we controlled for socioeconomic status (SES), gender, IQ, and kindergarten adjustment.

Two additional hypotheses were tested in supplemental analyses. First, we examined the extent to which children demonstrated consistency across both the academic and social domains. SDT (Deci and Ryan, 2000) states that humans have an innate tendency toward coherence but that this integration process needs environmental support for autonomy to function optimally. Similarly, recent educational research by Wentzel (2001) has shown that democratic and empathetic socialization practices seem to help children to coordinate the multiple demands of teachers, peers, and their own needs. We thus tested whether experiencing maternal autonomy support would be associated with more consistency in adjustment, as reflected in congruent levels of academic and social competence. Finally, we predicted that autonomy support would also be associated with high overall adjustment by testing whether maternal autonomy support increases the odds of children simultaneously showing high competence in both the academic and the social domains.

METHOD

Participants

The sample consisted of a subsample of the original Sears et al. (1957) study of 379 5-year old children. These researchers selected a stratified sample by sex and ordinal position of the child, and by socioeconomic status of the family. Approximately one half of the sample was from public schools in the upper-class Boston suburb of Newton, whereas the other half was from public schools in the working class suburb of Watertown. All children in this study were from White, two-parent households. Full details of the sampling are available in Sears et al. (1957). A subsample of 132 participants for whom adjustment and achievement measures were available at age 8 was used for the current investigation.

Age 5 Measures

Maternal interview. Extensively trained, college-educated women interviewed mothers in their homes. The interview format was standardized and included 72 questions as well as dozens of preselected probes. All questions were open-ended and were asked of every mother. Probes were used only when necessary. The interview questions focused primarily on each mother's self-reported actions and feelings toward her child. For example, mothers were asked, "Some parents praise their children quite a bit when they are good, and others think you ought to take good behavior for granted and that there's no point in praising a child for it. How do you feel about this?" Some questions focused on the mothers' descriptions of their child's temperament and personality and on the personality and behavior of their husband.

The interview covered the central areas of the child's functioning such as eating, sleeping, neatness, rules, obedience, response to limits, rewards, punishments, aggression, dependency, learning, achievement, and relationships with parents, siblings, and peers. Extensive sociodemographic information was also gathered. All interviews were transcribed (average length = 50 pages). Sears et al. (1957) report that these transcriptions were rated by two trained raters on over 100 different dimensions. The inter-rater reliability of all of the scales that we selected from the maternal interviews was superior to alpha = .80. It should be noted that the interview transcriptions were also used to make new ratings of maternal autonomy support.

Socioeconomic status and child's gender. Familial SES was a composite index (ranging from 1 to 9) of the status level of the father's occupation,

the family's annual income, and the education levels of both the mother and the father. The child's gender was also coded.

Maternal use of rewards. Two raters coded the extent to which mothers used rewards such as privileges, money, points, and gold stars. A 9-point scale was used with "1" indicating that rewards were never used and "5" indicating occasional use. A rating of "9" indicated that the mother regularly gave rewards for good behavior, had developed an elaborate system for earning rewards, and believed that rewards were highly effective.

Maternal use of praise. Two raters coded the extent to which the mother praised the child's behavior. A 9-point scale was used with "1" indicating no use of praise and "5" indicating occasional use. A rating of "9" indicated that the mother regularly praised, admired, and showed affection for a wide range of good behaviors.

Maternal investment in school achievement. This variable was coded by two raters based on a mother's response to the question "How important is it for your child to do well in school?" A 9-point scale was used with "1" indicating that doing well in school was not important, "5" indicating that it was important but with reservations (e.g., doesn't want to push the child too hard), and "9" indicating that it was very important (e.g., great emphasis placed on it).

Autonomy support rated from interview transcripts. The original Sears et al. (1957) study did not code interviews for maternal autonomy support. We therefore obtained the original interview transcripts and developed a rating scale to measure this construct. Grolnick and Ryan (1989) had developed a system to rate parental autonomy support and showed that it could be reliably rated and that the ratings were predictive of various child outcomes. We used this system to code four distinct aspects of autonomy support that have been shown in experimental studies to promote internalization of desired norms and behaviors (Deci et al., 1994; Koestner et al., 1984). Raters reviewed the sections of each interview that focused on mothers' efforts to socialize their children's behavior in such domains as table manners, interpersonal relations, performance of household tasks, general obedience, responsiveness to the rules of the house, standards of surveillance, and use of discipline. In each of these domains, the following four items were used to judge the extent to which mothers displayed the following autonomy-supportive behaviors: (a) provided rationale and explanation for behavioral requests; (b) recognized the feelings and perspective of the child; (c) offered choices and encouraged

initiative; (d) minimized the use of controlling techniques. Raters used 5-point rating scales and calculated a global score for each autonomy support element, averaged across socialization domains.

Three raters coded 20% of the interviews, and their ratings showed acceptable levels of inter-rater reliability: providing rationale, alpha = .80; recognition of child's perspective, alpha = .70; offering choice, alpha = .75; minimizing controlling techniques, alpha = .86. These reliabilities were similar to those obtained by Grolnick and Ryan (1989). The averaged ratings on the four subscales of autonomy support were highly positively correlated (average $r = .54$) and were therefore combined (average) to form a global index of maternal autonomy support. For the subset of interviews coded by three raters, scores were averaged across raters.

Teacher-rated social and academic adjustment at age 5. Kindergarten teachers rated children on six behavioral dimensions, using a 7-point scale. Three items reflected a social adjustment construct (i.e., "shows a conscience," "not impulsive," and "does not quarrel with other children") and formed a scale with an internal reliability alpha of .66. Two items reflected an academic adjustment (i.e., "emulates teacher" and "works well with classmates"). These two items have an internal reliability alpha of .66. The final item assessed dependency and was not included.

Age 8 Measures

Intelligence Quotient (IQ). The Kuhlmann-Anderson Intelligence Test (form C) was used. It was a widely used, standardized, group test of intelligence that yields a mental age and an intelligence quotient score for each participant. It was administered and scored by school guidance personnel.

Academic adjustment at age 8. Third-grade teachers completed the Classroom Behavior Scale (Abbott, 1960), which consists of 10 questions regarding the display of desirable academic behaviors. Teachers used 9-point scales for which they were given three or four behavioral anchor points. Representative examples of the questions included the following: "How promptly does he begin his work on assigned academic tasks?" "What kind of standards does he set regarding the appearance of his work?" "What does he do with remaining time if he finishes assigned work early?" "How well does he listen when you are talking in class?" The internal reliability of the scale was acceptable, alpha = .84.

Social adjustment at age 8. Third-grade teachers completed the Social Development Scale (Abbott, 1960), which consists of seven questions regarding desirable social behaviors. Teachers used 3-point scales, labeled "seldom," "at times," and "not at all," to rate the following behaviors: "is courteous to others," "cooperates well in a group," "shows good sportsmanship," "accepts responsibility willingly," "demonstrates self-control," "respects the property of others," "respects the rights and opinions of others." The internal reliability of the scale was acceptable, alpha = .81.

School achievement (age 8). The Stanford Achievement Test, Elementary Battery, Form J, was used to measure math and reading. It is a well-known, standardized test used to measure important skills and knowledge of children in the elementary school years. The test was administered and scored by the children's teachers. Scores for math and reading are used in the present study.

RESULTS

Description of the Current Sample

Preliminary analyses of the subsample of 132 participants used in the present study indicated that it was highly representative of the 379 participants in the original Sears et al. (1957) sample. *T*-tests revealed no group differences on demographic or parental ratings. Fifty-four percent of the current sample was female. Regarding SES, the sample was evenly distributed from upper-lower to upper-middle class. Fathers' occupations ranged from unskilled laborers to professional and managerial positions (Sears et al., 1957).

Table 1 presents the descriptive statistics of the study's variables. In general, children's social and academic adjustment was rated high in both kindergarten and grade 3. Children had somewhat above average IQs. Parents tended to be invested in their children's educational achievements, and they used both praise and reward moderately in regulating the behavior of their children. Ratings of autonomy support were also moderately high in this sample.

Table 2 reports the correlations among all the measures. It can be seen that being a girl was positively associated with higher kindergarten adjustment ratings, with academic competences in third grade, and with maternal use of praise. As expected, IQ was

Table 1
Means and Standard Deviations of Studied Variables

	Mean	*SD*
Age 5		
SES	4.49	2.39
Soc. Adj. K	5.15	1.36
Acad. Adj. K	4.44	1.54
Invest. Perf.	5.18	2.06
Rewards	4.75	2.57
Praise	4.70	1.76
Autonomy Support	3.57	0.80
Age 8		
IQ	107.10	9.57
Acad. Adj.	6.29	1.74
Social Adj.	2.84	0.29
Math.	93.66	9.08
Reading	97.06	12.47

Note. $N = 113$ to 132. SES = socio-economic status; Soc. Adj. K = social adjustment in kindergarten; Acad. Adj. K = academic adjustment in kindergarten; Invest. Perf. = investment in child's performance; IQ = intelligence quotient; Social Adj. = social adjustment in third grade; Acad. Adj. = academic adjustment in third grade.

associated with all of the academic measures in the study. While SES was positively related to autonomy support, it was (surprisingly) negatively associated with maternal investment in school performance. In kindergarten, teachers' ratings of social and academic adjustment measures were positively related to each other, and both were linked with later reading performance. Social adjustment was also positively related to classroom behaviors in grade 3. Regarding maternal motivation strategies, autonomy support and investment in performance were negatively related to each other. Mothers' use of rewards was negatively associated with social adjustment in kindergarten. Autonomy support was related positively to academic and social adjustment in third grade, while stressing the importance to perform was linked with better academic adjustment in grade 3 but worse social adjustment that year. Finally, in third grade, academic adjustment was significantly positively related to the other school adjustment measures. Math and reading achievement were highly

Table 2
Correlations Among Studied Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Female	—												
2. SES	−.08	—											
3. IQ	.23**	.06	—										
4. Social Adj. K	.23***	.02	.14	—									
5. Acad. Adj. K	.21***	.05	.18*	−.03	—								
6. Invest. Perf.	−.02	−.15**	.07	.02	−.05	—							
7. Rewards	−.00	−.03	.08	−.10*	−.05	.10	—						
8. Praise	.10*	−.02	.03	.03	.07	−.05	.06	—					
9. Autonomy Supp.	−.05	.31***	.06	.09	−.09	−.18*	−.11	.15	—				
10. Acad. Adj. gr. 3	.27**	.07	.41***	.20*	.15	.18*	.07	.08	.21*	—			
11. Social Adj. gr. 3	.17	.10	.14	.17	.06	−.30**	.04	−.01	.29**	.25**	—		
12. Math Perf.	.19*	−.12	.32***	.14	.08	.28**	.06	.04	−.06	.53***	−.23*	—	
13. Reading Perf.	.22*	.11	.52***	.18*	.19*	.25**	−.06	.05	.16	.54***	.02	.67***	—

Note. *Correlation significant at $p < .05$. **Correlation significant at $p < .01$. ***Correlation significant at $p < .001$. SES = socio-economic status; Social Adj. K = social adjustment in kindergarten; Acad. Adj. K = academic adjustment in kindergarten; Invest. Perf. = investment in child's performance; IQ = intelligence quotient; Social Adj. gr. 3 = social adjustment in third grade; Acad. Adj. gr. 3 = academic adjustment in third grade.

positively related, and social adjustment was (surprisingly) significantly negatively related to math achievement.[2]

Central Analyses

To examine the relation between preschool maternal autonomy support and child adjustment in third grade, four separate hierarchical linear regression analyses were conducted with social adjustment, academic adjustment, reading achievement, and math achievement as the dependent variables. Participants' gender, SES, IQ, and their kindergarten adjustment measures were entered together as a first set of predictors. The four maternal ratings were entered as a second set (investment in performance, use of rewards, use of praise, and autonomy support). The four gender × parenting interaction terms were entered as a third set of predictors. Because none of the interactions with gender approached significance for any dependent variable ($ps > .10$), we report the multiple Rs and omnibus significance tests from after the entry of the second set of variables.

Table 3 presents the standardized regression coefficients for all four dependent variables. First, for social adjustment, the regression yielded a significant multiple R of .47, $F(8,106) = 3.41$, $p = .002$. Maternal investment in the child's educational performance was significantly negatively related to social adjustment whereas maternal autonomy support was significantly positively related to this outcome. No other effects approached significance.

Second, for academic adjustment, the analyses yielded a significant multiple R of .53, $F(8,118) = 5.48$, $p < .001$. It can be seen that gender was significantly positively related to academic adjustment, reflecting that girls were rated more highly by teachers on this dimension than boys. Children with a higher IQ were also rated more positively on this rating. Regarding maternal variables at age 5, investment in child's educational performance and autonomy support were both significantly positively related to children's academic adjustment at age 8. No other effects approached significance ($ps > .10$).

2. It was surprising that the age 5 and age 8 school-adjustment measures were not more highly correlated. This may relate to the greater structure and demands that are present in grade 3 relative to kindergarten. It was also surprising that parental autonomy support was unrelated to adjustment in kindergarten; it seems that it is only later in school that this parental variable begins to show its relationship with adjustment.

Table 3
Standardized Regression Coefficients of Third Grade Adjustment by IQ and Age 5 Variables

	Adjustment		Achievement	
	Social	Academic	Reading	Math
Step 1				
Gender (female)	.14	.21*	.13	.13
SES	.04	− .01	.06	− .10
IQ	.10	.34***	.45***	.29***
Acad. Adj. K	n/a	.06	.09	− .02
Soc. Adj. K	.13	n/a	n/a	n/a
Step 2				
Invest. Perf.	− .27**	.18*	.27**	.25**
Rewards	.08	.00	− .13	− .02
Praise	− .07	− .02	− .03	− .01
Autonomy Support	.24*	.23**	.17*	− .02

Note. *Beta significant at $p < .05$. **Beta significant at $p < .01$. ***Beta significant at $p < .001$. SES = socio-economic status; IQ = intelligence quotient; Soc. Adj. K = social adjustment in kindergarten; Acad. Adj. K = academic adjustment in kindergarten; Invest. Perf. = investment in child's performance.

For reading achievement, the regression yielded a significant multiple R of .62, $F(8,119) = 8.68$, $p < .001$. It can be seen in Table 3 that IQ was positively related to children's reading performance. Maternal investment in the child's educational performance and maternal autonomy support were both significantly positively related to children's reading achievement at age 8. No other effects approached significance ($ps > .10$).

Finally, for math achievement, the regression yielded a significant multiple R of .45, $F(8,119) = 3.49$, $p = .001$. It can be seen on Table 3 that IQ and maternal investment in the child's educational performance were significantly positively related to children's math achievement in third grade. No other effects approached significance ($ps > .10$).[3]

3. Maternal affection and strictness were available in the Sears et al. (1957) data set. When these parenting style variables were included in the linear regression analyses, the main effects remained significant.

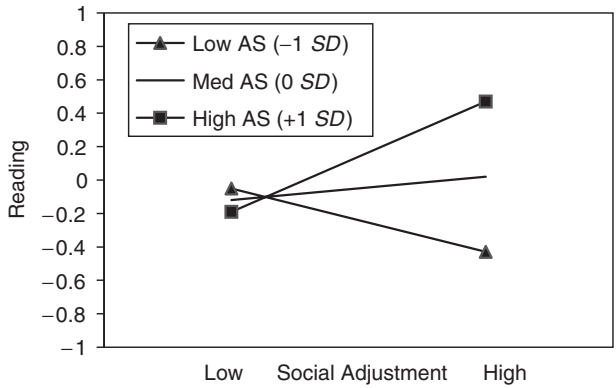

Figure 1. Reading performance as predicted from the social adjustment of children receiving low, medium, and high maternal autonomy support.

Supplemental Analyses

In order to examine whether autonomy support relates to consistency across the social and academic adjustment at age 8, moderator multiple regressions were performed. In three separate regression analyses, each of the academic measures was regressed on social adjustment, maternal autonomy support, and the interaction of social adjustment and autonomy support, which was calculated as a product term. All three regressions revealed significant interaction effects between autonomy support and social adjustment: $\beta = .32$, $p < .001$ for academic adjustment, $\beta = .28$, $p < .01$ for reading achievement, and $\beta = .21$, $p < .05$ for math achievement. Figure 1 depicts how maternal autonomy support moderates the relation of social adjustment to reading performance (Aiken and West, 1991). For children whose mothers are high in autonomy support, social adjustment tends to be positively related to academic measures. In contrast, adjustment levels in the social and academic domains tend to be incongruent for children whose mothers show low autonomy support.

Finally, a series of logistic regression analyses were conducted to test whether maternal autonomy support is associated with higher global adjustment, that is, simultaneously showing high adjustment in both the social and the academic domains. First, all adjustment measures were recoded as high versus low, following a median split. Next, categories of high social/high academic (adjustment, reading, math) adjustment were created. Group membership was regressed on the same child and mother factors used in our previous linear

Table 4
Odds of Being High on Social and Academic Measures, by IQ and Age 5 Measures

	High in Social Adj. and Acad. Adj.	High in Social Adj. and in Read Perf.	High in Social Adj. and in Math Perf.
Gender	0.5	0.5	0.6
SES	1.0	0.9	1.1
IQ	1.1	1.1**	1.0
Soc. Adj. K	1.6*	1.5*	1.2
Acad. Adj. K	1.3	1.5**	1.2
Reward	1.0	1.0	1.0
Praise	1.3	1.0	1.0
Invest. Perf.	1.2	1.0	1.0
Autonomy	3.1**	3.0***	1.6

Note. Data are given as odds ratio. *Beta significant at $p < .05$. **Beta significant at $p < .01$. ***Beta significant at $p < .001$.

regressions. The logistic regressions' results can be seen in Table 4 and consist of odds ratio. Results reveal that among these factors (entered together in the same set of predictors), only social adjustment in kindergarten and maternal autonomy support are characteristics that were statistically significant in distinguishing membership in the group of children high in both social adjustment and in academic adjustment. In distinguishing membership in the group of children high in social adjustment and in reading performance, maternal autonomy support was also a statistically significant factor, along with IQ and kindergarten measures of social and academic adjustment. Finally, no child or maternal characteristic could distinguish membership in the group of children high in both social adjustment and in math performance. Autonomy support was found to increase the odds of children being high in both social and academic adjustment, as well as high in both social adjustment and in reading achievement.

DISCUSSION

The goal of the present study was to examine the over-time relations of maternal autonomy support and other motivational strategies to

children's social and academic adjustment. The most important finding was that maternal autonomy support measured in kindergarten was positively associated with social adjustment, academic adjustment, and reading achievement in third grade. These results are in line with Grolnick and Ryan (1989) and also extend that work by their longitudinal nature. Regarding achievement, it is intriguing that autonomy support was related to better reading, while it was unrelated to math achievement. In the Grolnick and Ryan (1989) study, autonomy support was also related to academic achievement, but no differential performance effect was examined since math and reading were aggregated in achievement indexes. The positive finding for reading in the present study may be due to the fact that parents tend to be more involved in children's acquisition of reading than math skills. For example, parents buy books for children as early as age 2 and read to them at home. It is possible that there is greater generalizability of autonomy effects to reading achievement because there has been direct parental involvement in this domain. Similar differential effects on performance were found in other studies. For example, Grolnick and colleagues (2002) found positive effects of maternal autonomy support on poems but not on a more structured map task.

A related but different hypothesis was that autonomy support would also be associated with more consistency across the two developmental domains. As predicted, results suggested that when mothers were autonomy supportive with their preschoolers, children later showed more congruence between their academic and social adjustment. For these children, showing good classroom behaviors or getting high grades was associated with being socially competent. In contrast, low levels of autonomy support seemed to forestall equal development across the social and academic areas. These results are consistent with self-determination theory's proposition that support of autonomy facilitates healthy and integrated functioning (Deci and Ryan, 1985, 1991, 2000). Recent laboratory studies (Deci et al., 1994; Joussemet et al., 2004) found that autonomy-supportive contexts promote consistency among various aspects of behavior.

Studies typically report that social and academic adjustments tend to go together. Wentzel (1991, 1993, 1999) investigated the nature of this relation and found that it was mediated by socially responsible (1991) and academically oriented behavior (1993). Wentzel (1999) outlines possible underlying mechanisms: (a) having social goals can

foster learning through positive academic exchanges; (b) self-regulatory skills can represent a common precursor to social and academic functioning; and (c) supportive relationships may foster the internalization of adults' valued goals. In the present study, the strength of the relation between social and academic adjustment depended on the level of maternal autonomy support. Perhaps this parental dimension affects social-academic consistency by influencing self-regulation and internalization processes (Deci & Ryan, 2000).

Previous researchers have noted that equal development across the social and academic domains is a particularly strong sign of healthy child adaptation (e.g., Barber, 1996), but another important school outcome is children's global adjustment (having equal but low adjustment in both areas is certainly a problem). As predicted, logistic regressions revealed that maternal autonomy support was associated with higher odds of children being "globally well-adjusted."

A complex set of results emerged for maternal investment in school performance. While it was positively associated with children's academic adjustment and with achievement in third grade, it was negatively associated with their social adjustment. Communicating the importance to do well seems to have a beneficial effect on children's academic behaviors in class, as well as on their actual performance in math and reading. However, emphasizing the value of performance might also have a cost since it is associated with significantly poorer social adjustment. This detrimental social effect was unforeseen. Perhaps mothers who stressed the importance of doing well in school placed a strong emphasis on performance goals, which would be less compatible with social goals and the spontaneity involved in making friends. Unfortunately, the meaning of this one-item variable is uncertain as it may reflect two dimensions (valuing school and pressuring child). Therefore, we can only speculate about why it relates differentially to academic and social adjustment.

The use of reward or praise was not found to relate to any of the child-adjustment measures. The regression analyses suggest that the mothers' use of tangible or verbal rewards with their preschoolers was unrelated to their children's adjustment or achievement in third grade. This absence of long-term association partially supports SDT (Deci and Ryan, 1985, 1991, 2000), which states that rewards don't promote long-term internalization and adjustment (Deci, Koestner, & Ryan, 1999). In fact, rewards can be experienced as controlling and even have detrimental effects, depending on how salient and

expected they are and the type of contingency that is used (Deci et al, 1999). No negative effects of rewards were found in the present study, but such specific information about the type of rewards used was not available. Moreover, Deci and his colleagues' meta-analysis (1999) reveals that while rewards have a robust and consistent negative effect on intrinsic activities, the effect on extrinsic motivation (such as in the present study) was negative but nonsignificant.

It is important to acknowledge limitations of our investigation. First, our maternal variables apply only to the first 5 years of life, but the meaning and effects of parenting practices may change with children's age (Darling & Steinberg, 1993). Second, the data were collected in a very different sociohistorical context, and the nature of the sample (homogenous population of middle-class American families) poses a generalization problem. Not only is the traditional family structure no longer the norm but also conformity and compliance in children were more highly valued by these parents and teachers (e.g., items of the teacher-rated academic scale were mostly about obedience and a receptive learner role). It is thus open to question whether similar patterns of results would be found within a more recent and diversified sample of families and for school adjustment measures that would include skills such as leadership and critical thinking. However, the study Grolnick and Ryan conducted in 1989 used a contemporary and heterogeneous sample of families and suggested similar positive results for autonomy support.

Finally, it is important to keep in mind that a longitudinal design does not demonstrate causal relations. As Harrington et al. (1987) remarked, "It is almost always possible to suggest that the correlations between child-rearing practices and subsequently observed characteristics are entirely spurious and due completely to the effects of unmeasured third variables such as genetically transmitted behavioral dispositions or socio-cultural factors that influence both the child rearing practices and children's later behavior" (p. 855). Although we controlled for some possible third variables, such as SES, kindergarten adjustment, and IQ, there are others that could possibly have been involved. Likewise, even though the central analyses controlled for children's kindergarten functioning and IQ, it is not possible to disentangle fully the bidirectional nature of the relation between children's adjustment and mothers' autonomy support.

The present investigation explored autonomy support as an important alternative to controlling parenting practices. This longitudinal study showed that maternal autonomy support was associated with social and academic adjustment in the classroom as well as actual achievement. Moreover, consistently high functioning across both the social and academic developmental domains was also associated with maternal autonomy support. Since it promotes healthy and integrated adjustment in children, autonomy support merits attention in research that explores the role of family factors in children's educational adaptation.

REFERENCES

Abbott, H. C. (1960). *A study of the relationship between child-rearing practices and school achievement*. Diss: Harvard Graduate School of Education.

Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Newbury Park, CA: Sage Publications.

Barber, B. K. (1996). Parental psychological control: Revisiting a neglected construct. *Child Development*, **67**, 3296–3319.

Barber, B. K. (2002). *Intrusive parenting: How psychological control affects children and adolescents*. Washington, DC: American Psychological Association.

Cowen, E. L., Hightower, A. D., Pedro-Carroll, J. L., Work, W. C., Wyman, P. A., & Haffey, W. G. (1996). *School-based prevention for children at risk: The primary mental health project*. Washington: American Psychological Association.

Darling, N., & Steinberg, L. (1993). Parenting style as context: An integrative model. *Psychological Bulletin*, **113**, 487–496.

Deci, E. L., Driver, R. E., Hotchkiss, L., Robbins, R. J., & Wilson, I. M. (1993). The relations of mothers' controlling vocalizations to children's intrinsic motivation. *Journal of Experimental Child Psychology*, **55**, 151–162.

Deci, E. L., Eghrari, H., Patrick, B. C., & Leone, D. R. (1994). Facilitating internalization: The self-determination theory perspective. *Journal of Personality*, **62**, 118–142.

Deci, E. L., Koestner, R., & Ryan, R. M. (1999). A meta-analytic review of experiments examining the effects of extrinsic rewards on intrinsic motivation. *Psychological Bulletin*, **125**, 627–668.

Deci, E. L., Nezlek, J., & Sheinman, L. (1981). Characteristics of the rewarder and intrinsic motivation of the rewardee. *Journal of Personality & Social Psychology*, **40**, 1–10.

Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. New York: Plenium Press.

Deci, E. L., & Ryan, R. M. (1991). A motivational approach to self: Integration in personality. In R. Dienstbier (Ed.), *Nebraska Symposium on Motivation: Vol.*

38. Perspectives on motivation (pp. 237–288). Lincoln: University of Nebraska Press.

Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, **11** (4), 227–268.

Eisenberger, R., & Cameron, J. (1996). Detrimental effects of reward: Reality or myth? *American Psychologist*, **51**, 1153–1166.

Georgiou, S. N. (1996). Parental involvement: Definition and outcomes. *Social Psychology of Education*, **1** (3), 189–209.

Grolnick, W. S., Frodi, A., & Bridges, L. J. (1984). Maternal control style and the mastery motivation of one-year-olds. *Infant Mental Health Journal*, **5**, 72–82.

Grolnick, W. S., Gurland, S. T., DeCourcey, W., & Jacob, K. (2002). Antecedents and consequences of mothers' autonomy support: An experimental investigation. *Developmental Psychology*, **38** (1), 143–155.

Grolnick, W. S., & Ryan, R. M. (1989). Parent styles associated with children's self-regulation and competence in school. *Journal of Educational Psychology*, **81** (2), 143–154.

Grolnick, W. S., Ryan, R. M., & Deci, E. L. (1991). The inner resources for school achievement: Motivational mediators of children's perceptions of their parents. *Journal of Educational Psychology*, **83** (4), 508–517.

Harrington, D. M., Block, J. H., & Block, J. (1987). Testing aspects of Carl Roger's theory of creative environments: Child-rearing antecedents of creative potential in young adolescents. *Journal of Personality and Social Psychology*, **52**, 851–856.

Joussemet, M., Koestner, R., Lekes, N., & Houlfort, N. (2004). Introducing uninteresting tasks to children: A comparison of the effects of rewards and autonomy support. *Journal of Personality*, **72** (1), 139–166.

Koestner, R., Ryan, R. M., Bernieri, F., & Holt, K. (1984). Setting limits on children's behavior: The differential effects of controlling versus informational styles on intrinsic motivation and creativity. *Journal of Personality*, **52**, 233–248.

Levine, M., & Perkins, D. P. (1997). *Principles of community psychology*. New York: Oxford.

Marchant, G. J., Paulson, S. E., & Rothlisberg, B. A. (2001). Relations of middle school students' perceptions of family and school contexts with academic achievement. *Psychology in the Schools*, **38** (6), 505–519.

Ryan, R. M. (1995). Psychological needs and the facilitation of integrative processes. *Journal of Personality*, **63** (3), 397–427.

Ryan, R. M., & Connell, J. P. (1989). Perceived locus of causality and internalization: Examining reasons for acting in two domains. *Journal of Personality and Social Psychology*, **57**, 749–761.

Ryan, R. M., & Grolnick, W. S. (1986). Origins and pawns in the classroom: Self-report and projective assessments of individual differences in children's perceptions. *Journal of Personality and Social Psychology*, **50**, 550–558.

Sears, R. R., Maccoby, E. C., & Levin, H. (1957). *Patterns of child rearing*. Evanston, IL: Row, Peterson.

Steinberg, L. (1990). Autonomy, conflict, and harmony in the family relationship. In S. S. Feldman & G. R. Elliot (Eds.), *At the threshold: The developing adolescent* (pp. 255–276). Cambridge, MA: Harvard University Press.

Steinberg, L., Elmen, J. D., & Mounts, N. S. (1989). Authoritative parenting, psychosocial maturity, and academic success among adolescents. *Child Development*, **60**, 1424–1436.

Steinberg, L., Lamborn, S. D., Dornbusch, S. M., & Darling, N. (1992). Impact of parenting practices on adolescent achievement: Authoritative parenting, school involvement, and encouragement to succeed. *Child Development*, **61**, 508–523.

Vallerand, R. J. (1997). Toward a hierarchical model of intrinsic and extrinsic motivation. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 29, pp. 271–360). New York: Academic Press.

Wentzel, K. R. (1991). Relations between social competence and academic achievement in early adolescence. *Child Development*, **62**, 1066–1078.

Wentzel, K. R. (1993). Does being good make the grade? Social behavior and academic competence in middle school. *Journal of Educational Psychology*, **85** (2), 357–364.

Wentzel, K. R. (1999). Social-motivational processes and interpersonal relationships: Implications for understanding motivation in school. *Journal of Educational Psychology*, **91** (1), 76–97.

Wentzel, K. R. (2001). The contributions of social goal setting to children's school adjustment. In A. Wigfield & J. Eccles (Eds.), *Development of Achievement Motivation* (pp. 222–241). New York: Academic Press.