



How home gets to school: Parental control strategies predict children's school readiness

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ABSTRACT

At-risk families' control style (autonomy support and coercive control) was examined in relation to children's school readiness; children's social skills and mastery motivation were hypothesized mediating variables. In two different, low-income samples from diverse ethnic backgrounds, one preschool sample recruited from Head Start ($N = 199$) and a school transition sample composed of children entering elementary school ($N = 344$), parental control styles were related to children's academic readiness modestly but significantly in the preschool sample and weakly in the school transition sample. Children's social skills and mastery motivation skills (persistence and goal orientation) were significantly related to the academic measures of school readiness, and fully mediated the association between parents' use of coercive behavioral control and academic readiness. Such mediation could not be tested for parental support of children's autonomy. The results indicate that a developmental cascade exists between parental control strategies and academic indices of school readiness, emphasizing the importance of family context models of school readiness. Furthermore, strong correlations between the domains of school readiness were found in both samples, reinforcing calls for a multidimensional approach to supporting school readiness in early childhood education programs.

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1. Parenting and children's school readiness

When children first leave their families to enter school, they and their parents face important changes in expectations and demands. Their successful negotiation of this transition is remarkably predictive of future school success: children's school outcomes are highly stable after the first 3 years of school (Alexander & Entwisle, 1988; Cowen et al., 1996), as are the dynamics of the parent–school relationship (Rimm-Kaufman & Pianta, 2000). For these reasons, the first few years of formal education are viewed as a sensitive period (Perry & Weinstein, 1998; Vecchiotti, 2003). The critical role that quality early childhood programs can play in facilitating children's successful transition is no longer debated (e.g., Pianta, Cox, & Snow, 2007). However, conceptual models need to be tested in order to better define the integrated skills that comprise quality programs and to identify the child-level mechanisms by which parenting behaviors contribute to academic achievement.

Children's school readiness is a key determinant of their successful transition to school (Pianta et al., 2007; Vernon-Feagans & Blair, 2006), which is why President Obama's Early Childhood

Initiative supports the need to prepare children age 0–5 to succeed later in school (<http://www.ed.gov/parents/earlychild/ready/resources.html>). The National Educational Goals Panel (1995) identified five domains of children's school readiness: (1) physical well-being and motor development, (2) social and emotional development, (3) approaches to learning, (4) language development, and (5) cognition and general knowledge. There is consensus that children's competences across these domains are interrelated and interact to support children's academic achievement and school success (Hirsch-Pasek, Kochanoff, Newcombe, & de Villiers, 2005; NAEYC, 1996; Rimm-Kaufman & Pianta, 2000). Additionally, family context is acknowledged as an important influence (Early, Pianta, Taylor, & Cox, 2001; Lunkenheimer et al., 2008; National Governor's Association, 2005; Rimm-Kaufman & Pianta, 2000).

Unfortunately, public policy does not reflect these insights. The implementation of standards-based accountability in education reform has placed disproportionate emphasis on the academic domains of readiness; i.e., language development, cognition (e.g., math and science), and general knowledge. The No Child Left Behind Act (NCLB) exemplifies this focus on standardized test performance in the domains of cognition and language (NCLB, 2001), to the neglect of other developmental domains.

President Obama's Early Childhood Initiative demonstrates a commitment to both academic and social–emotional domains of readiness, and acknowledges the importance of the family context. Effective implementation of such policies would be abetted

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by empirical evidence related to how family processes affect children's school readiness. Although extant research has identified child-level and family-level variables that predict adjustment to school and school success (e.g., *Child Trends*, 2000), it is uncertain how these variables interact across levels and which are key mediating mechanisms. Studies that investigate school readiness using both child and family indicators with tests of mediational chains, as in the present studies, are important building blocks of ecologically valid, whole-child approaches in early childhood programs (Hirsch-Pasek et al., 2005; McWayne & Cheung, 2009). It is important to identify how family-level variables such as parenting behaviors affect school adjustment and achievement through child-level school readiness indicators. As national support for universal preschool grows, increasing the opportunities to close achievement gaps, it is critically important that empirical evidence of mediational links among child and family readiness domains are presented (McWayne & Cheung).

The purpose of these studies is to examine whether children's skills (social skills and mastery motivation) in the social-emotional and approaches to learning domains of readiness mediate the relation between parenting practices and children's academic skills. In these studies, we focus on parental control strategies (Darling & Steinberg, 1993) that influence children's academic success in the early years of elementary school. We are interested specifically in parental control that supports autonomy (Mattanah, 2005), as well as excessive or coercive behavioral control (Barber, 2002; Coie & Dodge, 1998; Nelson & Crick, 2002), and how these control styles contribute to children's success in the academic domain. In addition, children's social skills and mastery motivation, representing the social-emotional domain and the approaches to learning domain of school readiness, respectively, are examined as possible child-level mediators of this relation (Bridges, 2003; Fantuzzo & McWayne, 2002). In doing so, we hope to reinforce the interconnectedness of the different domains of school readiness that is documented in the extant literature (e.g., *Child Trends*, 2000; Rimm-Kaufman & Pianta, 2000). Furthermore, we hope to demonstrate the importance of family context to school readiness, and explore the possible mechanisms that explain how parental control styles contribute to children's readiness and academic achievement to ensure that no child is left behind.

1.1. *Autonomy supportive parental control, social skills, and academic success*

Parental control strategies are consistently associated with children's adjustment to school (Brooks-Gunn & Markman, 2005; Cowan, Cowan, Ablow, Johnson, & Measelle, 2005; Frodi, Bridges, & Grolnick, 1985; Grolnick & Ryan, 1989). Maternal control that is supportive of children's autonomy in kindergarten, for instance, is significantly related to children's school adjustment and achievement in first grade (Mattanah, 2005) and later in third grade (Joussemet, Koestner, Lokes, & Landry, 2005). This is supported by the NICHD ECCRN (2004) findings that parental support of autonomy was significantly associated with reading and math achievement in third grade after controlling for demographic variables.

The putative mechanisms by which parental control that supports autonomy translates into success in school are: children's development of social responsibility (Wentzel, 1991), positive social interactions with peers (Fantuzzo, Sekino, & Cohen, 2004), intrinsic motivation to learn (Deci & Ryan, 2000; Ryan & Powelson, 1991), self-regulatory behavior (Pelletier, Fortier, Vallerand, & Brière, 2002; Wentzel, 1999), and internalization of adult values (Deci & Ryan, 2000; Wentzel, 1999). Also, children's ability to work independently contributes to academic achievement in the middle

grades (Grolnick, Ryan, & Deci, 1991; NICHD ECCRN, 2004) as well as later in adolescence (Steinberg, Elmen, & Mounts, 1989).

Parental control that encourages autonomy promotes children's social competence. Children's autonomy is viewed as a critical component of social competence because it is the first step in negotiating one's independence in social context (Crockenberg & Litman, 1990). This view of autonomy is supported by Garcia Coll and colleagues' (1996) finding that preschoolers' autonomy was a key characteristic associated with social adaptive functioning. Autonomy support is also correlated with higher levels of children's self-reported autonomous regulation as well as ratings of competence, adjustment, and school achievement (Grolnick & Ryan, 1989; Mattanah, 2001, 2005; Pelletier et al., 2002; Ryan & Powelson, 1991; Van Aken & Riksen-Walraven, 1992). Longitudinal data from the NICHD Early Child Care Research Network (2004) replicated these results in that the children whose parents were supportive of their autonomy were the most socially competent and exhibited fewer problem behaviors. Furthermore, preschooler's autonomy predicts positive peer play interactions (Fantuzzo et al., 2004), which implies that children's autonomy causally precedes social skills.

1.2. *Excessive parental control strategies, social skills, and academic success*

Excessive parental control strategies are associated with elevated aggression in children (Nelson & Crick, 2002), and these early problem behaviors significantly hamper children's success in school (Raver, 2003; Raver & Knitzer, 2002). Social and behavioral problems at school entry are associated concurrently and longitudinally with poor academic and social outcomes, including increased risk of school failure (Raver), poor cognitive, language, and motor skills (Bor & Sanders, 2004; Craig-Unkefer & Kaiser, 2002; Fantuzzo & McWayne, 2002), and poor approaches to learning skills (e.g., mastery motivation, attention, and task engagement) (Coolahan, Fantuzzo, Mendez, & McDermott, 2000; Schwartz, McFadyen-Ketchum, Dodge, Pettit, & Bates, 1999).

Extensive research on problematic parental control strategies, such as coercion, excessive power assertion, and harsh punishment, documents how these control practices contribute to aggressive behavior and impaired social competence, as well as a higher incidence of externalizing behavior (e.g., Laible, Carlo, Torquati, & Ontai, 2004; Nelson & Crick, 2002). Longitudinally, harsh parenting when children are toddlers predicts reactive and proactive aggression at age six as well as into adolescence (Dodge, 1991; Vitaro, Barker, Boivin, Brendgen, & Tremblay, 2006). Highly aggressive children are doubly at risk in school because they have more academic difficulties (Arnold, 1997) and they are more isolated from peers, which in turn contributes to multiple negative child outcomes (see Lindsey, 2002). This developmental cascade spawned by coercive parenting is most often seen in preadolescent boys, but coercive parental control strategies have been found to be associated with aggression among preschool girls as well, even with family structure controlled (Eddy, Leve, & Fagot, 2001).

Coercive behavioral control also compromises children's school readiness by means of its effect on children's prosocial behavior and self-regulation (e.g., Eddy et al., 2001; Vitaro et al., 2006). A recent meta-analysis found that coercive parental control was consistently positively related to preschoolers' noncompliance, but not to inhibition and emotional regulation (Karreman, van Tuijl, van Aken, & Dekovik, 2006). These data suggest that children whose parents depend on coercion to control behavior are likely to be delayed in the development of self-regulation because, according to Kopp's (1982) model, compliance is a precursor to more advanced forms of self-regulation such as inhibition in the

absence of external monitors and emotion regulation. Notably, teachers view all of these types of self-regulation as essential to success in the early grades (Denham, 2006; McClelland, Acock, & Morrison, 2006). Indeed, self-regulation predicts emergent literacy as well as performance on achievement tests (McClelland et al., 2007).

1.3. Mastery motivation and school readiness

Deci and Ryan's work (2000) examining the motivation of intentional behavior placed it on a continuum between autonomy and control. Autonomously motivated behavior is associated with increased engagement, enjoyment, and interest in tasks as well as with increased levels of creativity and cognitive flexibility (Deci & Ryan). This organismic perspective, where the outcomes of intentional behavior only can be understood when the motivation for such behavior is taken into account, can be used to examine how parenting practices influence children's learning behaviors. If parents frequently use coercive control strategies, then their children are less likely to autonomously motivate intentional behaviors when the external authority figure is absent. Conversely, parents who support children's autonomy are more likely to have children who use autonomously motivated intentional behavior (Frodi et al., 1985; Grolnick & Ryan, 1989).

Parents who promote autonomy nurture their children's mastery motivation (for a review, see Bridges, 2003). This association has been observed in toddlers where the dependent variables were persistence and competence – components of mastery motivation (Frodi et al., 1985) – as well as in 3-year olds, who were less likely to avoid difficult tasks if they had had autonomy supportive mothers at age 2 (Kelley, Brownell, & Campbell, 2000). Several studies of first graders have shown that persistence scores (indicators of mastery motivation) on the Temperament Assessment Battery for children are significant predictors of reading and achievement scores (Martin, Drew, Gaddis, & Moseley, 1988; Martin & Holbrook, 1985; Schoen & Nagle, 1994). Similarly, higher levels of mastery motivation are strongly related to reading and math achievement for both first and third graders (Broussard & Garrison, 2004). Mastery motivation and self-regulation also correlate with reading achievement scores in children age 5 to 8 (Howse, Lange, Farran, & Boyles, 2003). It is therefore not surprising that mastery motivation is a key component of the approaches to learning dimension (McWayne, Fantuzzo, & McDermott, 2004), one of the five child competency dimensions contributing to school success.

The studies reviewed above support the hypothesis that parents' encouragement of autonomy is modestly related to children's school readiness in the social-emotional, approaches to learning, and academic domains. The studies presented in this paper investigated mediational chains among both child-level variables and contextual variables (i.e., parenting practices) that support development of school readiness, answering McWayne and Cheung's (2009) call for such research. The relation between autonomy and academic competencies is hypothesized to be mediated by children's social skills (i.e., cooperation, compliance) as well as their mastery motivation (e.g., Bridges, 2003). Furthermore, we test the postulate that coercive control strategies compromise children's social competence (i.e., aggression, noncompliance) and, thus, school readiness. These hypotheses were tested in two different samples in order to determine whether the results were replicable with: (a) families who differed in risk profile, (b) children who were in preschool vs. early elementary school, and (c) different measures of school readiness (Preschool Study) vs. success in the first years of elementary school (School Transition Study). From an applied developmental framework (Crnic & Lamberty, 1994), testing a model in samples that differ in whether children have yet

entered school provides insights into whether the same processes apply to readiness for school versus school achievement.

2. Preschool study

2.1. Method

2.1.1. Sample

Families ($N = 207$) were recruited from two rural counties in the Rocky Mountains that had a diverse ethnic population: 12% Hispanic, 54% Anglo, 30% Native American, and 4% other ethnic groups in this sample. They were recruited primarily from Head Start centers but some enrolled through other community agencies that serve low-income families. Recruitment was by means of flyers sent home with the children, presentations at family nights, referrals from teachers and community service providers, and word of mouth. Monetary incentives were provided for completion of surveys as well as completion of the intervention program. Only the baseline data were used. For this study, one parent ($n = 14$ fathers) and one preschool child from each family were selected for inclusion, which resulted in a final sample of 199 dyads with a child between 3.00 and 5.56 years old ($M = 4.11$ years); 50.5% of the children were female. The eight families who were excluded had a nonparent caregiver.

The following demographic information pertains to the 199 dyads used in the final sample. In terms of social class, the mothers' Duncan SEI, a measure of occupational prestige, was 26.12 ($SD = 14.56$) and the fathers' was 27.83 ($SD = 14.74$), which would be unskilled labor. The mothers had completed 12.74 years of education ($SD = 2.00$) and the fathers, 12.77 ($SD = 1.94$); 28% of the parents had dropped out of high school. The average annual family income was \$21,049 (*median* = \$17,000); 63% received some form of welfare. The mothers' average age was 30.18 ($SD = 7.18$) and the fathers' mean age was 33.31 ($SD = 7.68$). Fifteen percent of the parents were single, 59% were married or remarried, 15% were separated or divorced, and 11% were cohabiting. The families included 2.38 children.

2.1.2. Measures

Given the diversity of the target families, it was important to evaluate the cultural relevance of the assessment instruments, which was done following procedures described by Knight, Viridin, and Roosa (1994). For instance, the alpha coefficients did not vary with ethnicity by more than ± 0.06 . Readabilities were assessed, through computerized text analyses, at the sixth grade level or lower. All of the children's measures were individually administered, in English, at the Head Start center or in the children's home, and parents completed questionnaires in (see Table 1) small groups under the supervision of a trained data collector. All procedures for both studies were approved by the university's Institutional Review Board.

2.1.3. Developmental level

The Battelle Developmental Inventory Screening Test (BDI; Newborg, Stock, Wnek, Guidubaldi, & Svinicki, 1984) contains 96 items, two per age level (birth to age 8) for each of five domains: personal-social, adaptive, motor, communication, and cognitive. The normative sample was representative with regard to ethnicity and income level; no significant differences in BDI scores by minority status were observed. The BDI is brief (10–30 minutes), it takes into account emerging abilities as well as fully developed skills, and it meets P.L.99-457 guidelines for early screening and intervention (Meisels & Provenge, 1989). For both utilitarian and psychometric reasons, test reviewers have uniformly lauded the BDI (Bliss, 2007; Harrington, 1985). It has high *alpha* (.87 in the current sample), retest, and interrater reliabilities, distinguishes clinical from

Table 1
Constructs assessed and instruments used.

Construct	Preschool sample	School transition sample
	Instruments used	
<i>Social Domain: Social skills</i> - Cooperation - Assertion - Self-control - Aggression and externalizing behaviors (inverse)	- Social Skills Rating System	- Social Skills Rating System - Child Behavior Check List (CBC-L)
<i>Approaches to Learning Domain: Mastery Motivation skills</i> - Persistence - Goal orientation - Engagement	- 7 structured tasks - Behavior Rating Scale from revised Bayley Scales - Dimensions of Mastery Questionnaire	
<i>Academic Domain: Language and Cognitive skills</i> - Communication - Cognitive - Reading and math	- Battelle Developmental Inventory Screening Test	- Social Skills Rating System (academic performance subscale) - CBC-L learning difficulties subscale

nonclinical cases, correlates with other diagnostic tests such as the Bayley Scales and language skills and predicts grade school performance (Guidubaldi & Perry, 1984).

2.1.4. Social competence

Two subscales from the Social Skills Rating System (SSRS; Gresham, 1986) were used to assess preschoolers' social skills and problem behaviors. The 39-item social skills subscale ($\alpha = .85$ in the current sample) assesses cooperation, assertion, responsibility, and self-control. Example items include "Invites others to join in activities," and "Responds appropriately to teasing by peers." Seven items assess externalizing (e.g., fights, bullies, threatens or argues) behaviors ($\alpha = .78$). Each child behavior was rated, by both parent and teacher, in terms of its frequency and importance to the rater. The SSRS was normed on a representative national sample. Test-retest reliabilities are adequate for the preschool teacher and parent forms ($r > .84$). In terms of validity, scores on the SSRS are highly correlated with other measures of social behavior, such as the Child Behavior Checklist and self-concept; it has factorial, discriminant, and convergent validity; and it distinguishes between relevant groups, such as those referred to special education (Gresham & Elliott, 1990).

2.1.5. Mastery motivation

Seven structured tasks were used to assess mastery motivation (see Jennings, 1991; Jennings, Yarrow, & Martin, 1984; MacTurk, Morgan, & Jennings, 1995): (1) catching paper fish with a magnetized fish pole, to assess goal-directed persistence; (2) a curiosity box that had 9–12 occluded objects; (3) a jigsaw puzzle that pretesting revealed to be challenging for 5-year olds; (4) stacking cups; (5) Barrel of Monkeys, which required the child to link plastic monkeys together by their arms; (6) tower building with small blocks; and (7) bead stringing. The number of tasks successfully completed, within the 5 minutes allotted to each task, was coded. On tasks 6 and 7, children were asked whether they would like to do an easy, moderate, or hard task, in order to assess preference for challenge. On the remaining tasks, the following behaviors were coded: (a) the number of 15-second blocks of goal-directed behavior, which involved "touches" and "manipulates;" (b) the amount of off-task behavior; and (c) bids for help or attention. Interrater reliabilities in this study were high ($kappa = .84$) as were stabilities over a year ($r > .57$). With the exception of preference for challenge, the mastery task scores yielded a single bipolar dimension ($\alpha = .85$ in this study) labeled *goal oriented*: (a) goal-oriented behavior, successful completion of tasks, and examiner ratings of task orientation (see below) were intercorrelated .46 to .78; and (b) off-task behavior and prompts were negatively related to time on task

($r_s = -.71$ and $-.44$) and to ratings of task orientation ($r_s = -.62$ and $-.32$).

Once the Battelle and the mastery motivation tasks were completed, the test administrator completed the 28-item Behavior Rating Scale (BRS) from the revised Bayley Scales. The cluster of nine items related to orientation and engagement with tasks was used ($\alpha = .87$ in this study).

Parents also rated their children on four scales from the Dimensions of Mastery Questionnaire (DMQ; Morgan et al., 1993). Only the 6-item scale related to persistence in play with peers was included because of its relevance to school adjustment (Taylor & Machida, 1994). These items include engagement in imaginary play, turn taking with peers, and involvement in joint play with peers. The DMQ has adequate internal ($\alpha = .85$ in the current sample) and test-retest ($r = .61$; Jennings & Dietz, 2003) reliabilities, and has evidence for its validity (see Jennings & Dietz).

2.1.6. Child-rearing practices

Parents completed two measures of child-rearing attitudes and practices. The Parent-Child Relationship Inventory short form (PCRI; Gerard, 1994) includes one scale, Limit Setting (9 items; $\alpha = .80$ in the current sample), that assesses consistent control vs. coercion. This scale contains a mixture of items on problematic child behavior (e.g., "My child is out of control much of the time;" "My child really knows how to make me mad"), parent anger (e.g., "I often lose my temper with my child"), and control (e.g., "I wish I could set firmer limits with my child"). Higher scores represent more positive attributes such as consistent, democratic control. Also included was the PCRI Autonomy, with 10 items related to encouraging independence versus being permissive and indulgent ($\alpha = .72$ in the current sample). The PCRI is uncorrelated with social desirability, is sensitive to the effects of parent education, and correlates with other measures of child-rearing practices (Gerard).

Caregivers also were asked how often they use 12 child-rearing practices, reported from 1 (*Never*) to 4 (*Often*). Each strategy includes concrete examples to ensure uniform interpretation. Based on factor analysis, punitive practices such as the frequency of spanking and criticizing were combined into Harsh Punishment, with $\alpha = .81$ and retest $r = .61$ in the current sample. In terms of validity, feelings of parental competence and the amount of prior caregiving experience are negatively correlated with Harsh Punishment (MacPhee, Fritz, & Miller-Heyl, 1996), and it is sensitive to the effects of intervention.

Harsh Punishment and Limit Setting were correlated $r = -.52$, which is not surprising given that coercive parent-child dyads (Patterson, 2002) are exemplified by contingent use of aversive

Table 2
Correlations (and descriptive statistics) among developmental level and predictor variables in preschool sample.

	2.	3.	4.	5.	6.	M	SD
1. Autonomy	-.09	-.05	.37*	-.08	.09	2.62	.42
2. Coercion		-.45*	-.12	-.02	-.17*	2.25	.41
3. Social skills			.28*	.08	.37*	1.13	.24
4. Persistence				-.01	.25*	3.17	.57
5. Goal orient.					.31*	.78	.17
6. Develop. level						72.95	1.78

Note. $N = 179-199$.

* $p < .05$.

behavior by the child (e.g., tantrums, disobedience) and parent (e.g., anger, rejection, nattering), including punishment. That is, the item content of both scales tapped into parent-reported aversive behavior of both child and parent that is consistent with coercive family processes. Therefore, Limit Setting was reverse scored and the two measures were then centered and combined into a single measure of coercive practices ($\alpha = .79$).

2.2. Results

All variables in the analyses were normally distributed. Teacher reports were not provided for 12 children; the correlations in Table 2 are based on pairwise deletion whereas the regression results are based on listwise deletion. Bivariate correlations found the child's developmental level to be weakly but significantly correlated with coercive behavioral control (see Table 2), and more strongly to various child indices of school readiness: social skills, and mastery motivation indicators (persistence, and goal-oriented behavior). Notably, parents' encouragement of autonomy was significantly associated with children's persistence (but not social skills), yet parental coercive behavioral control was associated, inversely, with children's social skills (but not persistence), suggesting that different child-rearing practices are associated with readiness through distinct pathways. Children's mastery motivation and social skills were correlated significantly with development level, and children's social skills were significantly related to their mastery motivation, supporting the hypothesis that domains of school readiness are interconnected.

In the next set of analyses, mediation was tested following procedures described in Baron and Kenny (1986); child age served as a covariate. The first condition for mediation is that the independent and dependent variables are significantly related to each other. The second condition is that the putative mediators are associated with both the independent variable and the dependent variable. This condition was not satisfied for autonomy and so the regression analyses focused on coercion as the independent variable. Goal orientation was not correlated with coercive parental control, but it was entered in the regression model in order to determine if it made a contribution to children's developmental level independent of the other mediators. A hierarchical regression, with child age covaried in step 1, showed full mediation for coercive control, which no longer explained variance in Battelle scores after the child mediators were entered. Both social skills and persistence had sig-

nificant beta weights but goal orientation did not (see Table 3). The $f^2 = 9\%$ variance in developmental level explained by the block of mediators represents a small/moderate effect size (Cohen, 1988).

2.3. Discussion

Parental support and control strategies were significantly associated with indices of school readiness in the cognitive domain. This supports previous research that parental autonomy support is associated with academic achievement (Joussemet et al., 2005; Mattanah, 2005) and extends the findings to a more ethnically diverse population. Specifically, the sample includes Native Americans (30%) who are grossly underrepresented in the extant literature. The mechanisms of social skills (Pelletier et al., 2002) and mastery motivation (Ryan & Powelson, 1991) that mediate the relation between autonomy support and academic achievement could not be tested because the conditions of mediation were violated. The limited importance of autonomy in the current study is discussed further in the general discussion.

Parental coercive control proved to be of particular importance in this study. Parents' use of coercive behavioral control strategies was inversely but significantly related to indices of school readiness in both the social and cognitive domain. These findings replicate previous studies that have shown strong negative associations between punitive parenting practices and children's self-regulation and prosocial behavior (e.g., Eddy et al., 2001; Karreman et al., 2006; Vitaro et al., 2006). The inverse relation between coercive control and children's cognitive development is of particular importance because most studies of power assertion have examined its effects on socio-emotional behavior rather than cognitive outcomes. Both findings affirm the importance of parenting as a key element of an ecological model of school readiness (Rimm-Kaufman & Pianta, 2000). As hypothesized, social skills and mastery motivation did fully mediate the association between coercive parental control and children's developmental level. This mediation highlights the integral roles of parenting and nonacademic facets of school readiness (e.g., social-emotional development; approaches to learning) in preparing children for a successful school transition (Fantuzzo et al., 2007; Rimm-Kaufman & Pianta).

Indices of school readiness in both the social domain (social skills) and approaches to learning domain (mastery motivation skills) were significantly related to readiness in the cognitive domain. This finding supports the hypothesis that among preschool children, school readiness is dependent upon multiple, interrelated skill domains, lending credence to defining school readiness by multiple domains (National Education Goals Panel, 1995). One practice implication of such results is that the goals of early childhood education need to reflect emphasis on all domains of school readiness, a point to which we return in the general discussion.

The results of this study are based on a low-income sample of children who are about to transition to school; information was not

Table 3
Hierarchical regression to test for child mediators of parental coercion's relation to children's developmental level.

Step and predictor	β	R^2_{Δ}
1. Child age	.65*	.424*
2. Social skills	.15*	.074*
Goal orientation	.07	
Persistence	.19*	
3. Coercion	-.08	.005
adj. R^2 (5,181)		.488*

Note. * $p < .05$.

Table 4
Correlations (and descriptive statistics) among teacher-rated academic skills and predictor variables in school transition sample.

	2.	3.	4.	5.	6.	7.	8.	M	SD
1. Autonomy	-.10	.04	-.10	-.24*	.08	.05	.15*	2.70	.41
2. Coercion		-.33*	.65*	.49*	.00	-.15*	.09	1.74	.39
3. Social skills			-.40*	-.32*	.08	.12	.13	1.33	.26
4. Aggression				.65*	-.24*	-.26*	-.10	.48	.34
5. Internalizing					-.08	-.12	-.16*	.39	.32
6. Self-control						.59*	.52*	1.45	.46
7. Cooperation							.62*	1.73	.49
8. Academic skills								3.18	.84

Note. $N = 232$.

* $p < .05$.

available as to their actual school performance. In the next study, we attempted to replicate these findings with a larger and more diverse sample who have entered school, and for whom teacher-rated academic skills are the dependent variable.

3. School transition study

3.1. Method

3.1.1. Sample

Families ($N = 344$) of children in grades K-2 were recruited from the Four Corners region of the Rocky Mountains, which included several Native American reservations as well as a rural agricultural area. As in the previous study, this was an ethnically diverse sample: 9% Hispanic, 36% Anglo, and 56% Native American; multiple ethnicities could be endorsed. They were recruited as in the preschool sample through elementary schools, early childhood programs, community agencies that serve low-income families, and tribal agencies. Unlike the preschool sample, however, income was not a criterion for selection into the study. The mothers had completed 12.52 years of education ($SD = 2.59$) and the fathers, 12.20 ($SD = 2.78$) with a range from 6 years to Ph.D. Compared to the preschool sample, fewer received welfare benefits (28%); information on annual income and occupation was not provided.

The mothers' average age was 35.63 years ($SD = 9.37$) and the fathers' mean age was 36.67 ($SD = 8.65$); 18% were single or divorced, 62% were married or remarried, and the remainder were cohabiting. The families included 3.15 children, and the target children were on average 6.56 years old.

3.1.2. Measures

As with the preschool sample, all measures were evaluated for cross-cultural equivalence. Parents completed questionnaires in small groups, in English, under the supervision of trained data collectors. Both parents and the children's teachers ($N = 80$ teachers at 26 different schools) completed ratings of child behavior on the Social Skills Rating System in order to reduce reporter bias. Three of the measures used in this sample were identical to those used in the first study: the SSRS, the Parent-Child Relationship Inventory, and Harsh Punishment ($\alpha = .94$, $.80$, and $.71$ respectively for parents in this sample). For this study, parents also completed a 10-item measure of coercion and parent-child conflict from the Behavior Checklist for Infants and Children ($\alpha = .76$ -. $.82$, MacPhee, 1986; $.79$ in this sample); teachers rated children's social and academic skills on the SSRS.

3.1.3. Academic competence

One scale of the teacher-report Social Skills Rating System measured academic competence, with eight items that assessed the teacher's perceptions of a child's academic performance and intellectual functioning, reading and math performance, and academic motivation. For example, the teacher would be asked: "Compared

with other children in my classroom, the overall academic performance of this child is . . .," rated from 1 (lowest 10%) to 5 (highest 10%). This scale has adequate reliability ($\alpha = .90$ in this sample), and is correlated with measures of academic achievement. In addition, seven items on the teacher form of the Child Behavior Checklist assessed the child's resistance to school-related tasks, poor school work, and learning difficulties ($\alpha = .91$). Conceptually, the SSRS academic competence score and the CBCL learning difficulties scale tap into a bipolar construct of early academic success (Child Trends, 2000), and also were correlated $r = -.78$, so the CBCL scale was reverse scored and composited with the SSRS scale for all but the structural equation modeling analyses ($\alpha = .90$).

3.1.4. Aggression

Parents completed the Aggression Scale of the Child Behavior Checklist (Achenbach & Edelbrock, 1983), which has 22 items, rated from 0 (not true) to 2 (often true), that assess defiance, disobedience, fighting, and teasing. They also completed 11 items related to internalizing behaviors. The CBCL has excellent psychometric properties, with alpha reliabilities exceeding $.90$ ($.91$ and $.80$ for Aggression and Internalizing, respectively, in this sample), and much evidence for its construct validity (Achenbach, 1999). Both CBCL scales were significantly skewed. Using the square root of each did not alter the results (e.g., correlations were within ± 04), so findings with the nontransformed scores are reported.

3.2. Results

Teacher-reported academic skills were available for 232 children and SSRS ratings for 249. The correlations in Table 4 as well as the test of the mediational model are based on the 232 children with complete data. Bivariate correlations were computed to determine how parenting practices were related to the child school readiness competencies, and these to teacher-rated academic skills. Academic skills were weakly correlated with autonomy granting but autonomy granting was unrelated to the parent- or teacher-rated mediating variables, with the exception of internalizing behaviors (see Table 4). Rather, parents' use of coercive control strategies was associated with academic skills, not directly ($r = -.02$), but via its association with children's aggression, which was related to teachers' ratings of self-control and cooperation. The latter two variables were related to academic achievement. Children's social skills were weakly related to children's academic skills (see Table 4). Child age was not significantly related to any of the mediating or dependent variables ($r < .06$) and so was not used as a covariate in the school transition sample analyses.

As in the preschool sample, a test of mediation for autonomy granting was not warranted because it was uncorrelated with the mediators. In addition, given that coercive control was not directly and significantly related to academic skills, a traditional approach to testing for mediation would be inappropriate. However, a media-

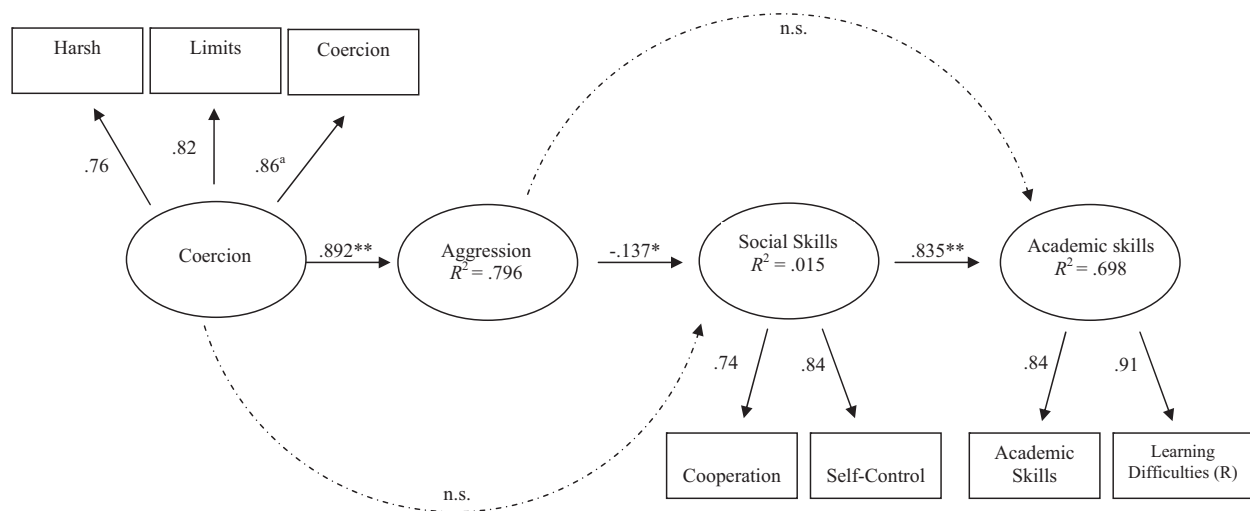


Fig. 1. Mediation chain between parent coercion and child readiness variables. *Fixed factor loading. * $p < .05$; ** $p < .01$.

tional chain appeared to apply, involving two intervening variables, which can be tested with structural equation modeling (McCartney, Burchinal, & Bub, 2006). Specifically, a mediational chain would be supported if a model involving a sequence of two (or more) mediators provides a better fit than models involving either mediator alone. Four nested models were tested using EQS version 6.1. Model fit was assessed through chi-square as well as three fit indices: the comparative fit index (CFI), the root mean square error of approximation (RMSEA), and the standardized root mean square residual (SRMR). For CFI, a value greater than or equal to .90 indicates adequate fit, and for SRMR, a value of .08 or less indicates a good model (Hu & Bentler, 1999). An RMSEA value of .08 or less indicates adequate fit (Little, Bovaird, & Card, 2007), although this cutoff is subject to debate with some recommending a more stringent RMSEA cutoff of .06 (e.g., Hu & Bentler, 1999) whereas more recent Monte Carlo simulations indicate that a single cutoff for valid models is not appropriate given that RMSEA values vary with sample size, degrees of freedom, and model specifications (Chen, Curran, Bollen, Kirby, & Paxton, 2008). Standardized factor loadings and path coefficients are reported.

In the baseline model, teacher-rated social skills and parent-rated aggression were hypothesized to contribute independently to teacher-rated academic skills. Parental support and control strategies were not included as putative precursors in this model in order to assess, in the next model, whether child-rearing practices – as opposed to temperament (e.g., Stright, Gallagher, & Kelley, 2008) – account for variations in children's behavior. The SSRS Cooperation and Self-Control scales served as indicators of social skills, and the Academic Skills scale of the SSRS and Learning Difficulties scale from the CBCL (reversed) were the indicators for the academic skills latent construct. A parcel approach was used for aggression. In this approach, items from the same scale are aggregated into multiple parcels (e.g., miniscales) and then these parcels are used as indicators of the latent variable. This approach is commonly employed in order to obtain more normally and continuously distributed variables, to decrease the number of parameters in the structural equation model (thereby creating a more optimal variable-to-sample-size ratio), and to obtain more stable parameter estimates (Hau & Marsh, 2004; Little, Cunningham, Shahar, & Widaman, 2002). We achieved this by creating three parcels of 7–8 items each. Assignment of items to parcels was carried out using the item-to-construct balance technique suggested by Little and colleagues (2002): items were assigned in alternating order to the three parcels based on their difficulty and discrimination (i.e., loading on Aggression). The hypothesized measurement

model was tested with maximum likelihood estimation, the most frequently used and recommended estimation method for SEM analyses (McDonald & Ho, 2002). Model fit was good, $\chi^2 = 8.26$, $p = .24$, CFI = .987, RMSEA = .024. All factor loadings were significant (see Fig. 1).

The baseline structural model had a poor fit for which 52% of the variance in teacher-rated academic skills was accounted for by the two predictors, CFI = .885; RMSEA = .126; SRMR = .158. Given that the two putative mediators did not provide a good fit when modeled as independent predictors, largely because the path between aggression and academic skills was nonsignificant, we did not test a model that added child-rearing practices as the independent variable.

In the next model, a mediational chain was tested in which social skills mediated the relation between aggression and academic skills, and in which aggression mediated the association between parental coercive control and social skills. This model provided a good fit, $\chi^2(17) = 48.84$, $p < .001$, CFI = .968, RMSEA = .051, SRMR = .07, that was a significant improvement ($\Delta\chi^2(5) = 31.43$, $p < .0001$) compared to the baseline model. Each direct path in the model was significant but none of the indirect paths were, supporting a mediational chain in which coercive parent control strategies relate to children's academic skills only through the intervening variables of children's social behaviors (see Fig. 1).

3.3. General discussion

Parental control strategies had nonsignificant to weak associations with cognitive measures of school readiness. However, this does not indicate that parents play a limited role in preparing their children for a successful transition to school because autonomy granting and especially use of coercive behavioral control were quite strongly related to children's social skills, which in turn were related to cognitive development and teacher-rated academic skills. These findings suggest that parenting practices that support social development at home and during preschool experiences may lead to better social and academic skills once children enter school. The analyses of mediation in both studies highlight the key roles played by cooperation, persistence, and especially aggression as mechanisms by which socialization practices in the home are "transferred" to success in the first years of formal education (Eddy et al., 2001; Laible et al., 2004; McClelland et al., 2007; Vitaro et al., 2006). These findings support the extant literature (e.g., Fantuzzo & McWayne, 2002; NGA, 2005) that demonstrates the importance of an ecological framework to guide empirical research on children's school readiness (Rimm-Kaufman & Pianta, 2000), particularly with

regard to family-level variables. Specifically, the findings of the present studies identify the possible child-level mechanisms by which parenting control styles might contribute to school readiness and academic achievement. Furthermore, they again highlight that mediational links among multiple domains exist for a transitioning school-age population as well as for preschool children (e.g., Bierman, Nix, Greenberg, Blair, & Domitrovich, 2008).

The significant associations found between social skills and cognitive competencies in both studies affirm the evidence from previous work that these domains are interrelated when children are transitioning to school (e.g., Henricsson & Rydell, 2006). In addition, mastery motivation was significantly associated with children's developmental level, thus supporting the link between the domains of approaches to learning and cognitive competencies. These findings, coupled with previous research, emphasize that early childhood education curricula should facilitate development in all domains of school readiness. Furthermore, they lend credence to Raver and Zigler's (2004) caution that isolated cognitive competencies in early childhood may not alone predict future school success, and supports their call for continued emphasis on the social-emotional and approaches to learning domains of school readiness.

Several inconsistent findings in the studies present a conundrum. For example, autonomy was significantly related to mastery motivation, as has been found in previous research (Bridges, 2003; Frodi et al., 1985; Kelley et al., 2000). Yet, in contrast to other studies (Pelletier et al., 2002; Wentzel, 1999), it was not related to social skills in either sample. Also contrary to previous studies (e.g., Joussemet et al., 2005; Mattanah, 2005), parental control that supported autonomy played a limited role in terms of academic readiness in the cognitive domain. Furthermore, autonomy supportive parental control was uncorrelated with coercive control strategies, whereas they were expected to be inversely related (e.g., Frodi et al., 1985). One explanation for these inconsistencies is that the measure of autonomy supportive strategies used in the present studies does not reflect the same construct that has been used in other research. The content of the items labeled as parental autonomy support may be more reflective of indulgent and permissive parenting. For instance, two items from the autonomy scale are, *Children should be given most of the things that they want and, If my child really wants something, I generally end up buying it*. Children's successful acquisition of autonomy is likely to have important implications for children's behavioral self-control and self-motivated engagement in learning. The importance of independent behavioral control and intrinsic motivation to children's academic success (Fantuzzo et al., 2007; Ryan & Powelson, 1991) supports the notion that parental control that supports autonomy and its development is a significant construct that needs to be further explored. If indeed children's autonomy and parental support of it are important constructs, greater attention must be paid to how each construct is operationalized in future research.

In both studies, parental coercive control was significantly inversely related to indices of school readiness in the social-emotional domain. This supports previous research that coercive behavioral control strategies predict lower levels of prosocial behavior and less effective self-regulation (Eddy et al., 2001; Karreman et al., 2006; Vitaro et al., 2006). This reinforces the critical role parenting plays in children's school readiness, as has been found in some earlier studies (e.g., Lunkenheimer et al., 2008), and the need for policy makers to use an ecological perspective in early childhood education programs that accords family life a central role (Rimm-Kaufman & Pianta, 2000). Contrary to our hypothesis, coercion was not directly associated with academic skills in the school transition study. This was surprising because social and cognitive indices of school readiness were strongly, significantly

associated and coercion and social indices were also significantly correlated. This incongruence suggests that a developmental cascade exists between punitive parenting practices and cognitive indices of school readiness that includes children's social competence.

It should be noted that the present studies, like previous studies, are correlational and therefore do not account for evocative effects. As Brooks-Gunn and Markman (2005) suggested, family social address factors such as education and economic status, as well as child characteristics and genetic similarities between parent and child, are possible confounds in the causal link between parenting and child outcomes. It is possible that child-level variables such as temperament may predict parents' control strategies and thus the child may be contributing to the relations found through confounding variables not explored in the current study. An additional limitation is that cross-sectional data do not provide as strong a test of mediation as do longitudinal data, in part because of potential spurious associations with other variables as well as the inability to control for baseline measures (see Cole & Maxwell, 2003). Although child-rearing practices conceptually precede children's success in school, neither data set in these studies permits causal inferences.

These studies have two important implications for early childhood education. The first is that an ecological perspective that includes parenting, particularly coercion, as an influential contributor to children's development and school success should be a core focus of early childhood education curricula. Future initiatives in early childhood education should reflect the important contributions that the family context adds to children's readiness. Specifically, cost-benefit analysis of early childhood curricula that include parent education boosters should be investigated using experimental designs. In turn, teacher preparatory programs should inform teachers about strategies for communication and collaboration with parents. Second, children's school readiness is a multidimensional construct and should not be truncated by shifting to an exclusive curricular focus on academic competencies. Overall, the findings support the importance of an ecological model of school readiness that is multidimensional. Specifically, they demonstrate the important role that parenting control style plays in children's development of readiness skills and academic achievement. These studies provide further evidence of the mediational links across developmental domains. This is especially salient given that NCLB has narrowed the focus of early childhood education curricula to cognitive competence, to the neglect of preparing the whole child for school entry.

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