

Parental Provision of Academic Structure and the Transition to Middle School

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This study examined parents' provision of academic structure, and whether they implement it in an autonomy supportive or controlling manner, in relation to children's competence-related beliefs, motivation, and academic behavior over the transition to middle school. Interviews with 160 sixth-grade children were coded on parental structure and autonomy support. Children reported on their competence-related beliefs, motivation, and engagement in sixth and seventh grades. Regression analyses showed that higher structure predicted seventh-grade perceived competence, intrinsic motivation, engagement, and English grades, controlling for these same outcomes at sixth grade. Autonomy support predicted perceived competence, autonomous motivation, and English grades, controlling for prior outcomes. Structural equation models indicated that relations between structure and engagement and between autonomy support and grades were mediated by perceived competence.

The transition to middle school is considered a period of vulnerability for adolescents (Petersen, Kennedy, & Sullivan, 1991), due in part to a series of changes associated with the transition, including a new and larger school, a move from one classroom and teacher to multiple classrooms and teachers, and higher expectations from teachers (Eccles, Midgley, & Adler, 1984). Further, the transition occurs at a time when adolescents are also experiencing numerous changes in relations to peers and parents, as well as biological changes that can be stressful on their own.

Researchers studying how children negotiate the academic transition to middle school have often focused on children's beliefs about themselves as students and their motivation to persist in their studies. Theorists reason that students must adjust to the new organization and expectations characterizing middle school and often reevaluate themselves as students and learners (Friedel, Cortina, Turner, & Midgley, 2010). In accordance, prior research has examined changes in students' competence-related beliefs across the transition, including their perceptions of competence (beliefs about their competence in school) and perceptions of control (beliefs that they can affect success and failure

outcomes). While some studies have shown declines in competence-related beliefs across the middle school transition (e.g., Anderman & Midgley, 1997; Eccles et al., 1993; Roeser & Eccles, 1998), others have found increases (e.g., Barber & Olsen, 2004; Proctor & Choi, 1994), and still others have found no changes (e.g., Friedel et al., 2010; Hirsch & Rapkin, 1987). With regard to motivation, intrinsic motivation has been found to decrease over the school years (e.g., Gottfried, Fleming, & Gottfried, 2001), and some researchers have noted particular declines at school transitions (Wigfield & Eccles, 2000), while others have not (e.g., Ratelle, Guay, Larose, & Senecal, 2004). Given that not all students show declines in academic competence-related beliefs and motivation, research on transitions has become less focused on whether there are declines and more on what specific variables may be affected, who experiences declines, and what factors prevent academic deterioration.

This study focuses on parental provision of academic structure, a key factor that may be protective for students at the transition to middle school. Given the potential threat of this transition to children's beliefs and motivation, parents' provision of structure in the form of clear expectations, rules, and consistency may help students maintain their competence-related beliefs and motivation over the transition to middle school, which in turn may prevent declines in school outcomes. Thus this study

This work was supported by a grant from the William T. Grant Foundation to Wendy Grolnick and Esteban Cardemil. The authors would like to thank the staff, children, and parents of the Worcester School District for their participation in this project.

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builds on work showing the importance of a supportive home environment for the transition to middle school (e.g., Bronstein et al., 1996; Grolnick, Kurowski, Dunlap, & Hevey, 2000; Lord, Eccles, & McCarthy, 1994; Schneider, Tomada, Normand, Tonci, & de Domini, 2008) by examining parental structure in relation to children's competence-related beliefs, motivation, engagement, and grades at the transition. In addition, beyond structure per se, we examined whether the way in which structure is implemented—supportive versus controlling of children's autonomy—makes a difference for children's transition to middle school. Among the questions we asked were the following: Do parental structure and the way in which it is implemented serve as protective factors for children's competence-related beliefs, motivation, and performance as they make the transition to middle school? Do structure and the way in which it is implemented affect children's engagement and performance by protecting against declines in competence-related beliefs and motivation?

Self-Determination Approach

We conceptualize our project using self-determination theory (SDT; Deci & Ryan, 1985, 2000), because this perspective specifies both what children need to be engaged and successful, and the social contexts that satisfy these needs. Thus, it provides a perspective to understand *why* certain contexts will be protective as children move to a new environment. In particular, SDT posits that individuals have three psychological needs; those for autonomy, relatedness, and competence (Deci & Ryan, 2000). When these needs are satisfied, individuals will show persistence and engagement in activities. These needs are connected to three dimensions of the environment, namely autonomy support versus control, involvement, and structure.

With regard to children, environments that support children's autonomy by acknowledging their perspectives, providing choice, and supporting their initiatives should facilitate children's experiences of themselves as autonomous (i.e., volitional or choiceful). By contrast, when environments control children, by pressuring them and providing little room for choice or initiative, children should feel coerced, controlled, and less autonomous. In addition, when environments are warm and involved, providing both tangible and intangible resources, children's need for relatedness will be satisfied. Finally, when environments support children's competence, by providing clear and con-

sistent guidelines and expectations, or structure, children's need for competence should be satisfied (Grolnick & Ryan, 1989; Skinner, Johnson, & Snyder, 2005). In the academic domain, SDT theorizes that children who experience environments high in autonomy support, structure, and involvement will have higher engagement and better academic performance. Although considerable empirical research has supported this proposition, the majority of SDT research has focused on the dimensions of autonomy support and involvement. This study is thus one of the first to specifically focus on structure and its corresponding need, competence.

From an SDT perspective, competence concerns the extent to which children believe that there are connections between their actions and desired outcomes, or perceived control (e.g., Skinner, Wellborn, & Connell, 1990), and whether children believe they are competent to affect outcomes, or perceived competence (Harter, 1982). Several studies have linked perceived control and perceived competence to children's academic behavior and performance. For example, children who are more confident in their abilities show more persistence during academic tasks, exhibit better performance, have higher educational aspirations (Eccles et al., 1984; Miserandino, 1996), and show more curiosity (Miserandino, 1996). Higher perceived control has been associated with both academic persistence and performance (Grolnick, Ryan, & Deci, 1991; Skinner et al., 1990). In this study, we focused on perceived control and perceived competence as key academic beliefs that may be vulnerable to the new organization and expectations of the middle school environment and that might be protected by parental provision of structure.

Structure

From an SDT perspective, structure is defined as the organization of the environment to facilitate competence. In particular, structure addresses the extent to which there are clear and consistent rules and expectations, and whether there are specified consequences for actions. Such a setup of the environment would make clear to children how their actions are connected to outcomes, enhancing their perceived control and competence (Grolnick & Ryan, 1989; Skinner & Belmont, 1993). There is some empirical support for the importance of classroom structure, although not specifically in relation to competence beliefs. Jang, Reeve, and Deci (2010) examined structure as the "amount and clarity of information that teachers provide to students about

expectations and ways of effectively achieving desired outcomes" (p. 589). They found that observer ratings of teachers' provision of structure were correlated with children's classroom engagement. Similarly, Sierens, Vansteenkiste, Goossens, Soenens, and Dochy (2009) found associations between adolescents' reports of teacher structure and their self-regulated learning.

Although there is limited literature examining parental structure from an SDT perspective, there is complementary research that has examined parenting dimensions relevant to the SDT concept of structure. Such research has examined parental attempts to regulate children's behavior and has included such concepts as behavioral control (e.g., Barber, 1996), firm control (Schaefer, 1965), and family management (Patterson & Dishion, 1985). Both behavioral control (Barber, Stolz, & Olsen, 2005) and family management (Amato & Fowler, 2002) have been linked to lower levels of problem behavior in children across a variety of ages and cultures.

Beyond these more general parenting dimensions, researchers have also studied parental strategies used to create a predictable and consistent environment. These studies have primarily examined parental strategies in relation to unsupervised time and acceptable and unacceptable behaviors. Results have shown that parents' setting and enforcing rules and expectations (Dishion, Patterson, Stoolmiller, & Skinner, 1991; Wang, Dishion, Stormshak, & Willett, 2011), providing consistent discipline (e.g., Hill, Bush, & Roosa, 2003; Patterson & Stouthamer-Loeber, 1984), taking a role in decision-making (e.g., Dornbusch, Ritter, Mont-Reynaud, & Chen, 1990; Fletcher, Steinberg, & Williams-Wheeler, 2004), and giving rationales for rules and expectations (Grusec & Goodnow, 1994; Hoffman, 2001) are associated with lower aggressive and problem behavior.

In the area of academics per se, parents' educational expectations and aspirations for students' achievement have been associated with children's academic self-efficacy, engagement, and intrinsic motivation (e.g., Fan & Williams, 2010; McWayne, Hampton, Fantuzzo, Cohen, & Sekino, 2004). Hoover-Dempsey, Bassler, and Burow (1995) found that 58% of parents reported rules for homework, and Natriello and McDill (1986) showed that when parents had rules for time spent on homework, children spent more time doing homework. These studies support the ecological validity of examining parental academic structure.

Some research on structure (general home structure, not specifically academic) has been conducted

from an SDT perspective. Grolnick and Ryan (1989) interviewed parents and had raters code them on two aspects of structure, clear rules and expectations and parents' consistency in following through on these. Higher levels of structure were associated with elementary school children's greater perceived control in school. Skinner et al. (2005) showed that parental structure was associated with higher levels of perceived control, engagement in school, and self-worth. Neither of these studies, however, was conducted at the transition to middle school.

Building on this literature, Farkas and Grolnick (2010) interviewed 75 seventh- and eighth-grade students about homework and studying in their homes and, from these interviews, rated parents on six components of academic structure: clear rules and expectations, predictable consequences, information feedback, opportunities to meet expectations, provision of rationales, and authority. The authors were able to combine five of the components into a composite structure index that was related to children's perceived competence, perceived control, engagement, and grades above and beyond effects of parental involvement and autonomy support.

This article builds on this work by examining parental provision of structure at the transition to middle school, a time at which parental structure may have an especially important role given the many changes that occur at this time. In addition, there is reason to believe that the way in which structure is implemented (i.e., facilitating vs. undermining autonomy) may also be important for children's motivation and competence and is thus also examined.

Autonomy Support of Structure

Beyond its presence per se, the way in which structure is communicated and implemented may be important. Specifically, the extent to which parents implement structure in a controlling manner (i.e., using pressure and coercion) versus using an autonomy supportive manner (i.e., including children in setting up rules and expectations and allowing for input and choice) may affect children's experience of autonomy as well as their engagement and performance.

Satisfaction of the need for autonomy can be indexed by students' level of autonomous motivation, which can vary from highly externally motivated to more autonomously motivated (Ryan & Connell, 1989). Types of motivation can be indexed by asking children why they engage in various

school behaviors, such as doing homework and classwork. These types of motivation, from less to more autonomous, are as follows: external (because of environmental contingencies), introjected (because of self-related affects such as guilt), identified (because of self-endorsed value or importance), and intrinsic (for fun or enjoyment). The types of motivation can be weighted and combined to form an index of autonomous motivation referred to as the Relative Autonomy Index (RAI). Finding ways to increase autonomous motivation is critical given the extensive research linking autonomous motivation to higher school performance, more adaptive coping with school setbacks (e.g., Ryan & Connell, 1989), and lower dropout (Vallerand, Fortier, & Guay, 1997).

The importance of both teachers' and parents' autonomy support for children's motivation has been demonstrated in a myriad of studies (e.g., Grolnick & Ryan, 1989; Reeve, Jang, Carrell, Jeon, & Barch, 2004; Soenens & Vansteenkiste, 2005). These studies, in contrast to this one, examine the overall (general) autonomy supportive style of parents. However, in this work, we look specifically at the extent to which parents implement structure in an autonomy supportive versus controlling manner. Thus, we expanded the Farkas and Grolnick (2010) interview to include how structure is implemented, on a continuum of autonomy support to control. Consistent with a definition of autonomy support as including children in decisions (e.g., Dornbusch et al., 1990), allowing open communication and criticism (e.g., Assor, Kaplan, & Roth, 2002), and providing empathy (e.g., Koestner, Ryan, Bernieri, & Holt, 1984) and choice (e.g., Moller, Deci, & Ryan, 2006), we delineated four components of autonomy supportive provision of structure (hereafter referred to as autonomy support): joint parent-child decision-making about rules and expectations, open exchange about rules and expectations, choice within rules and expectations, and parental empathy for the child's perspective. We expected that when parents implemented structure in an autonomy supportive manner, it would help satisfy children's need for autonomy, especially given that middle school classrooms have been found to be more controlling (Anderman & Maehr, 1994) and performance goal-oriented (Anderman & Midgley, 1997) than elementary classrooms.

Hypotheses

Based on SDT, we hypothesized that structure would be positively associated with children's

perceptions of competence and control and negatively associated with children's maladaptive control beliefs across the transition to middle school. We also predicted that autonomy support would be positively associated with autonomous motivation for school across the transition to middle school. However, given that others have found cross-need relations (e.g., autonomy support vs. control has been associated with perceived competence and perceived control; e.g., Grolnick et al., 1991; Skinner et al., 2005), suggesting that to feel competent children may need some ownership of their actions (Grolnick & Ryan, 1989), we also examined cross-need relations, for example, whether autonomy support was associated with perceived competence and control and whether structure was associated with autonomous motivation. We also expected that both structure and autonomy support would be positively associated with school behavior and performance across the transition. We included engagement in learning as an index of school behavior, conceptualized in SDT as the "outward manifestation of motivation, namely energized, directed, and sustained action" (Skinner, Kindermann, Connell, & Wellborn, 2009; p. 225). Engagement is highly related to school achievement and completion (Appleton, Christenson, & Furlong, 2008). We also included children's grades as an outcome in this study.

Finally, consistent with the SDT model that self-system processes (children's beliefs and motivation) mediate the relations between contexts and domain-specific outcomes (Connell & Wellborn, 1991), we predicted that perceived control and competence would mediate relations between parental structure and academic behavior over the transition to middle school. In addition, we predicted that autonomous motivation would mediate relations between autonomy support and academic behavior over the transition to middle school.

There is mixed evidence that boys and girls experience the transition differently, with some showing greater decreases in competence-related beliefs for girls (Eccles et al., 1993) and others showing a greater connection to schools for girls relative to boys (Akos & Galassi, 2004). Children from lower parental education and/or minority status backgrounds have a more difficult time transitioning to middle school (e.g., Burchinal, Roberts, Zeisel, & Rowley, 2008; Gutman & Midgley, 2000). Although there is no evidence that structure has differential effects for children with different demographic characteristics, these factors were included as exploratory variables.

METHOD

Participants

In Year 1, participants were 160 sixth-grade students (72 boys, 88 girls; mean age 11 years, 5 months ($SD = .61$)) recruited from an urban school district in a medium-sized city. The sample was ethnically and socioeconomically diverse, 43% Hispanic, 38% European American, 6% African American, 2% Asian, and 9% multiethnic. Fifty percent of the children lived in intact two-parent families, 24% with single parents, 20% had parents who were separated, divorced or widowed, and 6% had parents who lived with an unmarried partner. Seventeen percent of mothers did not complete high school, 24% completed high school or a GED, 33% completed some vocational training or college, 18% completed college, and 8% reported schooling beyond college. For fathers, 20% did not complete high school, 30% completed high school or a GED, 37% completed some vocational training or college, 16% completed college, and 6% reported schooling beyond college.

The 160 families who participated in sixth grade were again contacted when the students were in seventh grade (all transitioned to a separate middle school), 1 year (± 1 month) from the time they participated the year before. Eighty-seven percent of the families ($N = 136$) were reached and agreed to participate again. The follow-up sample thus included 136 students (62 boys, 74 girls; 41% European American, 42% Hispanic, 6% African American, 1% Asian, 7% multiethnic, and 3% other ethnicity). The students included in the longitudinal sample were compared to those who did not participate in Year 2 ($N = 24$). The two groups did not differ in terms of child gender, $\chi^2 = .27$, $p = .61$, ethnicity, $\chi^2 = 3.50$, $p = .32$, or maternal education, $t(1,159) = 1.81$, $p = .08$). However, the longitudinal group included a somewhat higher percentage of intact two-parent families (41%) and a somewhat lower percentage of divorced and separated families (8.7%) than the group that participated only at Year 1 (21% and 21% respectively, $\chi^2 = 7.59$, $p < .02$). T-tests were conducted to test for differences in the two groups on all sixth-grade variables. Of the 13 variables, there was only one significant difference; children who participated at both times were somewhat lower in external motivation ($M = 2.89$, $SD = .73$) relative to those who participated only in sixth grade ($M = 3.12$, $SD = .62$), $t(1,159) = -2.37$, $p < .02$, Cohen's $d = .34$).

Procedure

Students were told about the project in their sixth-grade classrooms and provided written information to give to their parents describing the project and asking them to indicate whether they would be interested in participating in the project. Sixty-one percent of families returned the letter, 66% of these responding affirmatively. Interested families were contacted and scheduled to participate either in their homes or in the university laboratory, according to parents' preferences. In seventh grade, families were again contacted and scheduled to participate either at their homes or at the university laboratory. Families signed consent forms and received \$60 at each visit to thank them for their participation.

Measures

Parental structure. In sixth grade, children participated in an interview assessing structure provided in the home (see Grolnick et al. (2014) for more information). The interview was conducted in a room separate from the parents so that parents were not able to hear questions or responses. The interview assessed parental provision of structure in the areas of homework and studying, unsupervised time, and responsibilities. In this article, we focus on the section on homework and studying.

The interview began with a general question about homework and studying ("Please tell me about your home with regard to homework and studying"). Children were then asked a series of questions designed to assess different aspects of structure and autonomy support. For structure, they were asked whether their parents had rules and expectations in their home concerning homework and studying, how consistently parents adhered to these rules/expectations, what happened when they did not follow the rules/expectations, and whether and what their parents told them about why these rules/expectations were in place. For autonomy support, children were asked how the rules/expectations were decided, whether they still talked about the rules/expectations with their parents, what sorts of choices they had about how to follow the rules, and what happened when they had a disagreement with their parents about the rules/expectations.

From the interview, two raters coded parents on the four components of structure and four components of autonomy support using 7-point scales. (Scales can be obtained from the first

author.) The four components of structure were as follows: 1) clear and consistent rules and expectations, 2) predictability of consequences, 3) provision of rationales, and 4) parental authority. The endpoints of these four ratings were as follows: Rules and expectations in the home are clear and consistent (= 7) versus there are no clear and consistent rules or expectations (= 1); response to rule-related behavior is known by the child and consistently applied (= 7) versus there are no consistent consequences for rule-related behavior (= 1); consistent communication of why rules and expectations are important for long-term well-being and competence (= 7) versus no stated long-term rationales (= 1); parents maintain leadership role (e.g., have decision-making power, authority to impose consequences) in the home (= 7) versus parents do not have leadership role in the home (= 1), respectively.

The four autonomy support scales were 1) joint establishment of rules/expectations, 2) open exchange, 3) empathy, and 4) provision of choice. Endpoints of these four ratings were as follows: Parents came up with rules together with child (e.g., invited/considered child input) (= 7) versus parent dictated rules and child was not permitted to voice his/her opinion (= 1); frequent and open discussion about rules (= 7) versus rules are not open for discussion (= 1); parents communicate that they understand the child's point of view even if they do not agree (= 7) versus parents ignore or ridicule child's perspective (= 1); options and alternatives about how to follow rules are provided (= 7) versus child must follow rules in exactly the manner parents specify (= 1), respectively.

Interrater reliabilities (intraclass correlations) for the four structure and four autonomy support components were mostly .7–.8, but ranged from .66 (jointly established) to .84 (rationale). Given that the components were hypothesized to be aspects of one of two specified factors (structure and autonomy support), the eight components were submitted to a confirmatory factor analysis using Amos version 19 (Arbuckle, 2010). The hypothesized two-factor model fit the data well, $\chi^2 = 38.2$, $p < .01$, comparative fit index (CFI) = .97, root mean square root of approximation (RMSEA) = .07. Paths for the four structure ratings on the structure factor ranged from .44 to 1.0 and for the four hypothesized autonomy support ratings on the autonomy support factor from .49 to .82. On the basis of these findings, structure and autonomy support composites were created by averaging the respective components.

Questionnaire Measures

Children's perceptions of control. Students' perceptions of control over their academic success and failure outcomes were assessed with the Student Perceptions of Control Questionnaire—Academic Subscale (Skinner et al., 1990). Students indicate how true each statement is on a scale from 1 (*not true at all*) to 4 (*very true*). Six items measured students' perceptions of overall control (e.g., I can get good grades in school, α sixth grade = .63, α seventh grade = .74) and two subscales measured maladaptive control; luck (e.g., to do well in school I have to be lucky), and unknown (when I do well in school, I usually do not know why). Items were averaged to form summary scores (possible range 1–4). As found in previous studies, the luck and unknown subscales were highly correlated ($r = .68$, $p < .001$) and therefore were combined to form a maladaptive control scale (sixth grade $\alpha = .86$, seventh grade $\alpha = .85$).

Children's perceptions of competence. Children reported on their perceptions of academic competence on the Self-Perception Profile—Academic Subscale (Harter, 1982). Each item presents two types of children, one representing a high (e.g., some kids do very well at their classwork) and the other a low (e.g., some kids do not do so well at their classwork) level of competence. Children choose which statement is most like them and then whether it is *sort of true* (= 2 or 3) or *really true* (= 1 or 4) for them. Items were averaged to form a summary score (possible range, 1–4). Cronbach's alphas were .81 at sixth grade and .78 at seventh grade.

Children's autonomous self-regulation. The degree of autonomy in children's school motivation was assessed using the Self-Regulation Questionnaire (Ryan & Connell, 1989). Items present school behaviors (doing homework, doing classwork, answering hard questions in class, and trying to do well) and for each reasons why children might engage in them. Four subscales vary in their levels of autonomy from low to high: external (e.g., because I would get in trouble if I did not; α sixth grade = .81; seventh grade = .76), introjected (e.g., because I would feel ashamed if I did not; α sixth grade = .90; seventh grade = .87), identified (e.g., because doing school work is important to me; α sixth grade = .90; seventh grade = .78), and intrinsic (e.g., because I enjoy doing my school work well; α sixth grade = .86, seventh grade = .90). Children rate how true each item is from 1 (*not true at all*) to 4 (*very true*).

Items are averaged to form four summary scores, each with possible ranges from 1 to 4. Subscales were also weighted (External $\times -2$, Introjected $\times -1$, Identified $\times 1$, and Intrinsic $\times 2$) to form the Relative Autonomy Index (RAI) which represents the degree of autonomy in children's motivation (possible range of -12 to 12). Validity and reliability of this index has been established in several studies (e.g., Grolnick & Ryan, 1987; Vallerand et al., 1997).

Student engagement. The ten items from the Academic Engagement Scale (Wellborn, 1991) were used to assess children's engagement in school (e.g., I try hard to do well; I participate in class discussions). Children indicate how true each item is on a scale from 1 (*not at all true*) to 4 (*very true*). Summary scores are averages of the items and have a possible range of 1–4. Alphas were .77 for sixth grade and .85 for seventh grade.

Grades

End-of-year English and math grades were obtained from schools at both sixth and seventh grade.

RESULTS

Effects of the Transition on Motivation and Academic Outcome Indices

Means and standard deviations for all variables at sixth and seventh grade are presented in Table 1. To determine whether maternal education should be examined in further analyses, correlations between education and all outcome variables were examined. Maternal education was positively correlated with perceived control, perceived competence, engagement, and grades and negatively correlated with maladaptive control perceptions and external motivation.

To examine whether there were differences in motivation and academic behavior by demographics (child gender and ethnicity (European American vs. minority)), whether outcomes changed over the transition, and whether changes differed by demographics, repeated-measures ANCOVAs were conducted with one within-subjects factor (time) and two between-subjects factors, child gender and child ethnicity, as well as maternal education as the covariate (see Table 2).

Notably, both intrinsic motivation and engagement decreased significantly from sixth grade to seventh grade, while identified motivation increased from sixth to seventh grade. There were

TABLE 1
Means, Standard Deviations, and Within-Time Correlations for Study Variables

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	Time 1		Time 2	
															M	(SD)	M	(SD)
1. Mother's education	—	.18*	.11	.27***	-.30***	.32***	-.20*	-.05	-.09	-.02	.09	.27***	.27***	.28***	3.42	(1.57)	3.42	(1.57)
2. Structure	—	—	.03	.15	-.17*	-.02	-.09	-.12	-.10	-.09	.02	.19*	-.02	.01	4.42	(.82)	4.42	(.82)
3. Autonomy support	—	—	—	.17*	-.22**	.19*	-.03	.11	.08	.01	.02	.23**	.27***	.30***	3.20	(.95)	3.20	(.95)
4. Perceived control	—	—	—	—	-.71***	.42***	-.05	-.05	.10	.05	.13	.37***	.32***	.31***	3.67	(.40)	3.67	(.40)
5. Maladaptive control	—	—	—	-.58***	—	-.44***	.18*	.12	.02	.01	-.16*	-.38***	-.29***	-.27***	1.62	(.57)	1.54	(.52)
6. Perceived competence	—	—	—	.46***	-.37***	—	-.12	.06	.12	.20**	.24**	.51***	.36***	.40***	3.14	(.74)	3.11	(.67)
7. External motivation	—	—	—	.03	.14	.04	—	.40***	.56***	.10	-.58***	-.15	-.18*	-.15	3.01	(.73)	3.08	(.57)
8. Introjected motivation	—	—	—	.06	.03	.14	.21*	—	.42***	.33***	-.31***	.06	.02	.06	2.77	(.88)	2.81	(.78)
9. Identified motivation	—	—	—	.39***	-.28**	.39**	.11	.32***	—	.42***	.10	.17*	.02	-.01	3.31	(.32)	3.49	(.49)
10. Intrinsic motivation	—	—	—	.21*	-.14	.42**	-.13	.35***	.57***	—	.63***	.27***	.14	.14	2.74	(.71)	2.51	(.74)
11. RAI	—	—	—	.19*	-.24**	.30***	-.66***	-.15 ⁺	.44***	.75***	—	.34***	.23**	.18*	.00	(2.05)	-.46	(2.20)
12. Engagement	—	—	—	.46***	-.41***	.59**	-.05	.30***	.55***	.52***	.39***	—	.40***	.32***	3.33	(.44)	3.21	(.51)
13. English grades	—	—	—	.22*	-.31***	.36**	-.11	.10	.12	.22*	.20*	.32***	—	.77**	8.29	(2.64)	7.86	(2.99)
14. Math grades	—	—	—	.31***	-.24**	.41**	-.02	.06	.15	.19*	.15 ⁺	.33***	.68***	—	7.85	(2.86)	7.78	(2.95)

Note. All variables except RAI (relative autonomy index) and grades are scaled from 1 to 4. RAI can vary from -12 to 12 . Grades are coded on a scale from 1 (= F) to 13 (= A+). Correlations above the diagonal are for Time 1 (sixth grade) variables, below the diagonal for Time 2 (seventh grade) variables. * $p < .05$; ** $p < .01$; *** $p < .001$.

TABLE 2
Repeated-Measures ANCOVAs for Motivation and Academic Behavior by Time, Gender, Ethnicity, and Maternal Education

Variable ^a	Mean (SD) ^d		F-Value			
	Sixth Grade	Seventh Grade	Time	Gender	Ethnicity	Maternal Education
Perceived control	3.67 (0.40)	3.67 (0.44)	0.61	1.10	0.90	8.68**
Maladaptive control	1.62 (0.57)	1.54 (0.52)	1.07	0.24	2.12	5.33*
Perceived competence	3.14 (0.74)	3.11 (0.67)	1.35	0.69	5.36**	3.15
External motivation	3.01 (0.73)	3.08 (0.57)	0.90	1.67	0.34	7.08**
Introjected motivation	2.77 (0.88)	2.81 (0.78)	1.45	1.63	0.92	1.27
Identified motivation	3.31 (0.82)	3.49 (0.49)	8.15**	0.01	0.07	0.29
Intrinsic motivation	2.74 (0.71)	2.51 (0.74)	3.23*	1.66	0.28	0.05
RAI ^b	0.00 (2.05)	-0.46 (2.20)	3.01	0.48	0.23	1.02
Engagement	3.33 (0.44)	3.21 (0.51)	3.82*	0.06	6.94**	6.71**
English grades ^c	8.29 (2.64)	7.86 (2.99)	0.57	6.72**	12.58**	3.47
Math grades ^c	7.85 (2.86)	7.78 (2.95)	0.50	2.62	11.44**	1.72

Note. Time by demographics interactions were included but are not depicted in the table as no results were significant.

* $p < .05$; ** $p < .01$.

^aAll variables except RAI (relative autonomy index) and grades are scaled from 1 to 4.

^bRAI can vary from -12 to 12.

^cGrades are coded on a scale from 1 (= F) to 13 (= A+).

^dMeans and standard deviations are in their original metric (not covariate adjusted).

no mean changes from sixth to seventh grade for perceived control, perceived competence, or grades. At sixth grade, girls had higher grades in English than boys ($F = 12.34$, $p < .001$, $M_{\text{girls}} = 9.10$, $SD = 2.18$, $M_{\text{boys}} = 7.47$, $SD = 2.89$). Children from minority backgrounds reported lower perceived competence and academic engagement and had lower grades than European American children. There were no significant interactions between time and demographics for any outcome.

There was moderate stability in the motivational indices ranging from $r = .27$ (intrinsic motivation) to $r = .61$ (maladaptive control), p -values $< .01$, with the exception of external and identified motivation which evidenced lower stabilities ($r = .15$ and $r = .05$, respectively) (See Table 3). Grades also showed significant stability (English, $r = .54$, $p < .001$, Math, $r = .57$, $p < .001$).

Descriptive Results for Parent Provision of Structure

The mean composite rating for structure was 4.43 ($SD = .82$) and that for autonomy support 3.20 ($SD = .95$), indicating that structure was somewhat higher and autonomy support somewhat lower than the midpoint of the 7-point scale. Parents provided more autonomy support ($F = 10.56$, $p < .01$) to girls ($M = 3.43$, $SD = .97$) than boys ($M = 2.92$, $SD = .85$) (Cohen's $d = .56$). Maternal education was significantly correlated with structure ($r = .18$, $p < .05$), although not with autonomy support ($r = .11$, ns).

There were no effects of family configuration or ethnicity on structure or autonomy support. The structure composite was not significantly correlated with the autonomy support composite ($r = .03$, ns).

Relations Between Parental Structure and Outcomes at Sixth and Seventh Grade

Before examining structure in relation to child variables across the transition, correlations were conducted between structure at sixth grade and child variables at sixth and seventh grades (see Tables 1 and 3). Higher structure at sixth grade was associated with less maladaptive control, and more engagement at sixth grade and with higher perceived competence, introjected motivation, and engagement at seventh grade. Higher autonomy support at sixth grade was associated with higher perceived control, perceived competence, engagement and grades, and lower maladaptive control beliefs at sixth grade. In addition, autonomy support at sixth grade was positively associated with perceived competence, introjected motivation, the RAI, engagement, and grades and negatively associated with external motivation at seventh grade.

Relations Between Parent Structure and Outcomes Across the Transition to Middle School

We conducted hierarchical multiple regression analyses to examine independent contributions of structure and autonomy support to students'

TABLE 3
Cross-Time Correlations Among Study Variables

Time 1 Variables	Time 2 Variables										
	Perceived Control	Maladaptive Control	Perceived Competence	External Motivation	Introjected Motivation	Identified Motivation	Intrinsic Motivation	RAI	Engagement	English Grades	Math Grades
Mother's education	.28***	-.23**	.14	-.12	.15	.08	.01	.04	.25**	.19*	.27**
Structure	.09	-.08	.16*	.09	.17*	.06	.15	.01	.20*	-.11	-.05
Autonomy support	.06	-.14	.21**	-.25**	.17*	.04	.13	.17*	.18*	.33***	.25***
Perceived control	.41***	-.43***	.29***	-.12	.04	.30**	.17*	.23**	.27***	.29***	.30***
Maladaptive control	-.36***	.61***	-.30***	.12	.04	-.21*	-.09	-.19*	-.29***	-.33***	-.25***
Perceived competence	.23**	-.21*	.45***	-.03	.18*	.26**	.25**	.17*	.29***	.50***	.43***
External motivation	-.23**	.15	-.05	.15	-.03	-.14	-.03	-.11	-.09	.10	-.02
Introjected motivation	-.15	.13	-.02	.03	.46***	.05	.09	-.11	-.00	.13	.06
Identified motivation	-.14	.00	-.00	-.04	-.00	.05	.01	.04	-.03	.14	.05
Intrinsic motivation	.12	-.17*	.08	-.10	.14	.22**	.28**	.24**	.21*	.25**	.15
RAI	.25**	-.28**	.10	-.20*	-.08	.26**	.18*	.31**	.20*	.10	.11
Engagement	.26***	-.30***	.47***	.02	.24**	.47***	.35***	.24**	.51***	.23**	.19*
English grades	.26***	-.30***	.19*	-.01	.17	.06	.13	.04	.34***	.54***	.53***
Math grades	.27***	-.28***	.24**	-.05	.11	.09	.13	.09	.33***	.54***	.57***

Note. RAI = relative autonomy index.
* $p < .05$; ** $p < .01$; *** $p < .001$.

competence-related beliefs, motivation, and academic behavior across the transition to middle school (see Table 4). In Step 1, we entered the students' prior belief, motivation, or academic outcome (sixth grade). At Step 2, we added students' gender, ethnicity, and maternal education. Finally, at Step 3, we added parental structure and autonomy support. We included interactions between parenting variables and both child gender and ethnicity, but as none were significant, they were excluded from the analyses.

Because there were hypotheses regarding structure and autonomy support for 11 outcomes, we used the Bonferroni correction to reduce the possibility of Type 1 error. Using a .05 significance level, the overall F for each full equation (Step 3) should be significant at .05/11 or .005 to be interpretable. Using this criterion, nine of the 11 regression equations (all but external ($p < .02$) and identified (p, ns) motivation met the criteria (p 's .005 to .0001).

For perceived control, sixth-grade perceived control predicted seventh-grade perceived control, but neither structure nor autonomy support added unique variance. Similarly, for maladaptive control perceptions, only sixth-grade maladaptive control perceptions were predictive. However, for seventh-grade perceived competence, both structure and autonomy support at sixth grade were positively predictive above and beyond the effects of sixth-grade perceived competence.

For introjected motivation, there was also a significant positive effect of structure above and beyond previous levels of introjected motivation. Similarly, for seventh-grade intrinsic motivation, the effect of structure was significant above and beyond the effect of sixth-grade motivation, with higher structure associated with higher intrinsic motivation across the transition. For seventh-grade RAI, autonomy support was predictive beyond the effect of sixth-grade RAI, with greater autonomy support associated with higher autonomous motivation.

For academic behavior, structure at sixth grade predicted seventh-grade engagement, beyond the effect of previous levels of engagement. Finally, for seventh-grade English grades, both structure and autonomy support at sixth grade were associated with higher grades over the transition. There were no effects of structure or autonomy support on math grades.

Mediational Models

To examine whether competence-related and motivational variables might mediate relations between

TABLE 4
 Regressions of Seventh-Grade Motivation and Academic Behavior Indices on Sixth-Grade Indices, Demographics, and Parenting^a

Predictor	Competence Motivation						Autonomous Motivation						Academic Behavior									
	Perceived Control		Maladaptive Control		Perceived Competence		External Motivation		Introjected Motivation		Identified Motivation		Intrinsic Motivation		RAI		Engagement		English Grades		Math Grades	
	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2	β
Step 1 Prior motivation/ behavior	.16*	.41***	.36*	.61***	.20*	.45***	.02	.15 ⁺	.21*	.46***	.00	.05	.07*	.28**	.10*	.31***	.27*	.51***	.30*	.54***	.37*	.57***
Step 2 Prior motivation/ behavior	.04	.37***	.01	.51***	.02	.34***	.01	.15	.07**	.48***	.04	.12	.02	.27**	.05	.31***	.08**	.49***	.06*	.51***	.02	.58***
Maternal education		.06*		-.02		.05		-.03		.08		.02		-.02		-.08		.01		.29 ⁺		.21
Sex		-.06		-.03		-.13		.00		.18		.06		-.05		-.30		-.06		.23		-.23
Ethnicity		-.02		.00		-.12		-.04		.01		-.09		-.11		.23		-.22**		.01		.15
Step 3 Prior motivation/ behavior	.00	.36***	.00	.50***	.08**	.34***	.07**	.12	.06	.48***	.01	.12	.06*	.28**	.06*	.31***	.03	.48***	.07**	.50***	.01	.55***
Maternal education		.06*		-.02		-.03		-.02		.05		.02		-.04		-.10		.00		.33*		.23
Sex		-.06		-.02		-.15		.10		.18		-.07		-.08		-.55		-.07		-.14		-.33
Ethnicity		-.02		.00		-.10		-.02		.04		-.08		-.09		-.26		-.21**		.01		-.19
Structure		-.00		-.03		.14*		.10		.21**		.05		.17*		-.02		.14*		.56*		-.11
Autonomy support		.01		-.02		.16*		-.16**		.06		.01		.11		.45*		.05		.51*		.13
Total R ²	.20		.37		.30		.10	.34		.05	.04	.14	.19	.31	.45		.40					

Note. N = 136. RAI = relative autonomy index.
^aValues are standardized regression coefficients.
 *p < .05; **p < .01; ***p < .001.

parental structure and autonomy support and children's academic outcomes, structural equation modeling (SEM) using Amos version 19 (Arbuckle, 2010) was used. Generalized least squares (GLS) method was used given that when sample sizes are below 500, GLS has been found to perform slightly better than maximum likelihood (Hu, Bentler, & Kano, 1992; Sugawara & MacCallum, 1993). Mediation tests require that the predictor variable be significantly associated with the potential mediator as well as with the criterion variable, and the mediator must be related to the criterion variable (Baron & Kenny, 1986). Therefore, it was possible to test two models: 1) structure and autonomy support to English grades through perceived competence and motivation, and 2) structure to engagement through perceived competence. As the RAI combines the types of motivation, for parsimony, only the RAI was used.

For English grades, we first estimated an indirect effects model in which structure and autonomy support at sixth grade were related to seventh-grade grades (controlling for sixth-grade grades) through perceived competence and RAI. Gender, ethnicity, and mother education were included as control variables by allowing paths for each variable to each of the model constructs and sixth-grade outcome. The model showed a good fit to the data, chi-square ($df, 9$) = 26.0, $p < .01$, goodness-of-fit index (GFI) = .97, RMSEA = .07. Next, to determine whether the mediational paths improved the fit, we added a direct path from structure to grades. The resulting model, chi-square ($df, 8$) = 22.2, $p < .02$, GFI = .97, RMSEA = .07, provided a better fit to the data, chi-square difference ($df, 1$) = 3.80, $p < .05$, indicating that there was a

significant path from structure to English grades. Including the direct path rendered the path from structure to perceived competence nonsignificant, and the indirect effect from structure to English grades was not significant. Next, a direct path from autonomy support to grades was added. The resulting model, chi-square ($df, 8$) = 23.0, $p < .02$, did not provide a better fit than the indirect model, chi-square difference ($df, 1$) = 3.0, $p = .10$, suggesting full mediation. The indirect effect from autonomy support to grades was significant ($p < .01$). Figure 1 presents the final model with significant paths included.

For engagement (see Figure 2), the indirect model provided an adequate fit to the data, chi-square ($df, 9$) = 17.2 $p < .05$, GFI = .97, RMSEA = .07. When a direct path from structure to engagement was added, the fit of the model was not improved, chi-square difference ($df, 1$) = 2.2, $p = .14$, and the path was not significant ($B = .06$). The indirect effect of structure to engagement was significant ($p < .05$).

In sum, the mediational analyses indicated a direct effect of structure on children's English grades as well as a mediated effect of autonomy support through children's perceived competence. For engagement, the results indicated a mediated effect of structure through perceived competence.

DISCUSSION

This study focused on relations between parental academic structure and young adolescents' competence-related beliefs, motivation, and academic behavior over the transition to middle school. We found that parental structure, and the way it is implemented, predicted children's perceptions of

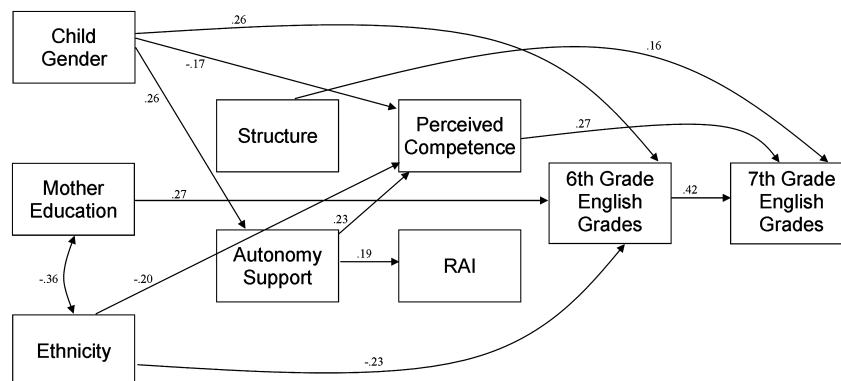


FIGURE 1 Mediation model of relations between structure and autonomy support and seventh-grade English grades (controlling for sixth-grade grades) through perceived competence and autonomous motivation (RAI = relative autonomy index). All values are standardized beta weights. Only significant paths ($p < .05$) are depicted. Model fit: chi-square ($df, 8$) = 22.2, $p < .02$, GFI = .97, RMSEA = .07.

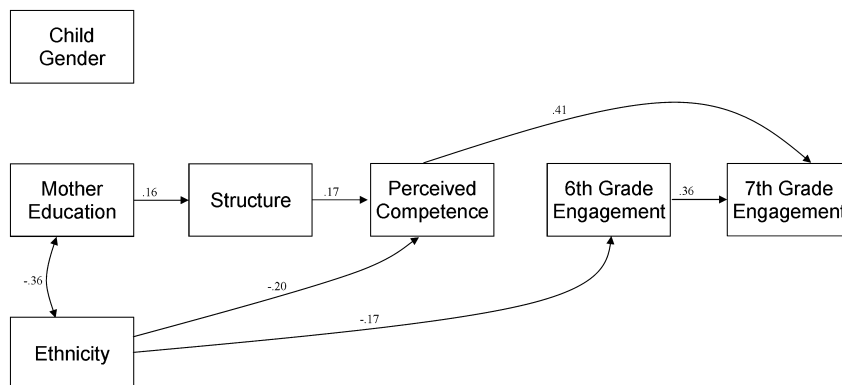


FIGURE 2 Mediation model of relations between structure and seventh-grade engagement (controlling for sixth-grade engagement) through perceived competence. All values are standardized beta weights. Only significant paths ($p < .05$) are depicted. Model fit: chi-square ($df, 9$) = 17.2, $p < .05$, GFI = .97, RMSEA = .07.

competence, autonomous motivation, and academic behavior, even controlling for prior levels of these variables. Further, there was some evidence for a pathway in which structure and autonomy support were associated with outcomes through children's perceived competence. These results, and those concerning the effects of the transition to middle school are discussed below.

There have been differing findings regarding effects of the middle school transition on competence-related beliefs and motivation. In this study, we found that some indices showed change and others did not. In particular, there were changes in motivation, with intrinsic motivation decreasing and identified motivation increasing. The decrease in intrinsic motivation is consistent with work showing an increase in extrinsic goals over the transition to middle school (e.g., Anderman & Midgley, 1997). The more controlling and performance goal-oriented context of middle school may undermine children's interest in and enjoyment of school. However, it is interesting that identified motivation increased. Thus, while children may enjoy school less, they appear to increasingly recognize the importance of school activities. The lack of changes for perceived competence and control is consistent with some recent work (e.g., Friedel et al., 2010).

Our primary analyses concerned the degree to which structure in the academic domain and the way in which it is implemented (autonomy supportive vs. controlling) predicted children's competence-related beliefs, motivation, and academic behavior. We found that structure at sixth grade positively predicted perceived competence, school engagement, and English grades over the transition to middle school. Thus, parents having in place

clear rules and expectations for homework and studying is associated with students feeling more competent, being more engaged, and performing better in English at the transition to middle school. This may occur in several ways. First, students may rely on these structures as they meet the challenging tasks of seventh grade. Second, they may be more resilient to the challenges to competence inherent in the transition to middle school and thus better able to maintain their confidence and engagement. Structure also positively predicted intrinsic motivation over the transition to middle school. This was somewhat unexpected as the SDT literature has generally linked intrinsic motivation with autonomy supportive environments. However, it is plausible that to maintain intrinsic motivation, children would need to have a back drop of structure upon which they can rely. Finally, structure also positively predicted introjected motivation. While this finding was unexpected, we speculate that parents whose homes are highly structured may have high expectations for their children that children may internalize in the form of self-oriented pressure to perform. Alternatively, children may see how much time and energy their parents are expending and feel some pressure to get their approval. More research on parenting and introjection is needed to further evaluate these possibilities.

There were also several effects of autonomy support. Consistent with predictions, autonomy support was associated positively with autonomous motivation (i.e., RAI). Perhaps, implementing structure in a way that allows children input makes for more ownership of learning and even of the rules and expectations themselves. Autonomy support thus sets the stage for the autonomous

motivation needed for the middle school environment. Autonomy support also positively predicted perceived competence and English grades. Thus, involving children in setting up rules and expectations and supporting their choices appears to help children maintain feelings of competence and grades, while controlling imposition of structure may undermine not only autonomous motivation but children's confidence in their abilities, which then becomes crucial for successful academic performance (Pomerantz & Eaton, 2000).

While there were several within and cross-time correlations between autonomy support and motivational outcomes, these may be just as likely child-to-parent as parent-to-child effects. For example, parents of children who are more autonomously motivated or competent may allow them more autonomy because they do their work on their own. The fact that autonomy support predicts competence-related beliefs and autonomous motivation, controlling for previous levels of these constructs, provides more support for the importance of this parent resource.

We suggested that structure and autonomy support might be associated with academic outcomes by helping to build the resources children need to manage the transition. Given that neither structure nor autonomy support predicted math grades, we examined this hypothesis for engagement and English grades. In the path model for English grades, structure had a direct effect while autonomy support had an indirect effect through perceived competence. We suggest that structure may provide concrete strategies and resources that children use to be successful. On the other hand, autonomy support may help children to feel ownership of their work, facilitating their sense that they can be successful. Interestingly, for engagement, the effect of structure was mediated. As engagement is a more active student outcome, it is possible that it is more linked to more internalized beliefs than a more concrete outcome like grades.

While autonomy support predicted greater autonomous motivation, the RAI was not linked to engagement or English grades in the mediational models. As others have suggested (e.g., Ryan & Connell, 1989), children can achieve for many reasons, and thus there are often weaker relations between autonomy and achievement outcomes than for other achievement-related beliefs. We reason that while perceived competence is a crucial resource for school performance, autonomous motivation might be more connected to other outcomes such as choices of classes and decisions about stay-

ing in school (Vallerand et al., 1997). Thus, autonomous motivation may be important but for future outcomes when children have more choices about their educational trajectories.

While there were significant results for English grades, neither structure nor autonomy support was associated with math grades in the regressions. There is some evidence that the home environment is more connected to reading relative to math achievement. For example, Bryk and Raudenbush (1988) found that aspects of the home environment predicted changes in reading, but not math achievement. Sui-Chu and Willms (1996) showed that parents' involvement at school was associated with reading but not math achievement, and Fan and Williams (2010) found positive effects of parental advising for reading, but not math achievement. Perhaps, when parents provide structure, they focus more on English. Alternatively, it is possible that the effects of parental structure on math achievement are overridden by factors at school. More research is needed to understand this issue.

Interestingly, while there were several effects of structure and autonomy support on seventh-grade outcomes (controlling for sixth-grade outcomes), other effects were apparent in the within- and cross-time analyses. For example, while there were no effects for perceived control in the regressions, there were within-time correlations between structure and autonomy support and children's perceptions of maladaptive control. These results suggest that these resources may be important for ongoing levels of perceived control. Further, both within and across time, there were significant correlations of autonomy support with most outcomes, including math grades, which were not apparent in the regressions. Again, some resources may be most connected to ongoing levels of support from parents, which themselves may be consistent.

In conclusion, the results of this study support the important role of parental structure and its autonomy supportive implementation at the transition to middle school. The interview method allowed for an analysis of specific strategies that parents might use to create a structured environment (e.g., use of clear and consistent guidelines, rationales, and predictable consequences). Further, it identifies ways that parents might implement these strategies in a motivationally facilitative manner (e.g., involving them in creating the rules/expectations, allowing ongoing discussion about them, providing empathy about having to adhere to them). The use of student interviews also avoids

the problem of social desirability in parents reporting on their own behavior. However, one limitation of interviewing the student rather than the parent was that many of the outcome variables were student-reported, making reporter bias a potential problem. However, because students' experience of structure and autonomy support (vs. parents' intention to provide these resources) is most proximal to their beliefs and motivation, the pros of interviewing students outweighed the cons. Further, although utilizing the same reporter, the interview and rating procedure involved a different method than the self-report questionnaires.

There were several other limitations. First, although we were able to retain a high percentage of our sample (87%), the sample that participated at seventh grade was somewhat more likely to be from two-parent homes and less likely to be externally motivated than the full sample. This may impact the generalizability of the results to the least motivated and most stressed families. Second, the measure of structure may not include all possible components. Future studies might include other structure components such as use of feedback and other autonomy support components such as encouraging children to develop their own learning strategies. Third, the reliability of the perceived control measure was somewhat low at sixth grade. Fourth, some of the relations between structure and outcomes were in the low range. Clearly, there are many factors that impact children's beliefs and motivation, and structure should be examined along with other parenting and teaching variables in further studies. Fifth, although we did not expect that higher order groupings such as classrooms and schools (all in the same district) would influence measured variables, we did not include such grouping in our analyses. Given that such groupings can affect the standard error or variance of estimates used to establish significance, it is possible that our findings slightly over or underestimate effects (Bliese, 2000). Finally, although the fit of our models was adequate and met both the criteria of sample size of 100–200 and a sample size to variable ratio of at least 10:1 (Thompson, 2000), the sample was on the small side for conducting SEM and should be replicated with a larger sample.

The results emphasize the important role of parental structure and its autonomy supportive implementation in the transition to middle school. Thus, parents may be able to help their children transition by providing clear rules and expectations, predictable consequences, and clear rationales. Our results show that these guidelines will be most successful if implemented in a way that

supports children's autonomy by including them in developing the guidelines, providing choice in relation to them, and providing empathy and opportunities for discussion around these guidelines, which may not always be eagerly embraced. As these strategies may not be intuitive to parents, implementing them may be difficult without the assistance of schools. Given that structure was associated with parent education levels, which may be associated with stress, lack of time, and less familiarity with the requirements of schooling (e.g., Gutman & Midgley, 2000), such assistance may be most crucial for more disadvantaged families. Information about implementing school-related structure in the home may be provided in various ways, for example, by holding workshops for parents, sending home pamphlets, and providing information at parent-teacher conferences. Future research could examine directly the challenges parents face when implementing structure and interventions aimed at increasing parental structure.

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