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Permalink

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Journal

Journal of educational psychology, 107(1)

ISSN

0022-0663

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Publication Date

2015-02-01

DOI

10.1037/a0037458

Peer reviewed

Value Development Underlies the Benefits of Parents' Involvement in Children's Learning: A Longitudinal Investigation in the United States and China

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This research examined whether the benefits of parents' involvement in children's learning are due in part to value development among children. Four times over the 7th and 8th grades, 825 American and Chinese children (M age = 12.73 years) reported on their parents' involvement in their learning and their perceptions of the value their parents place on school achievement as well as the value they themselves place on it. Children's academic functioning was assessed via children's reports and school records. Value development partially explained the effects of parents' involvement on children's academic functioning in the United States and China. For example, the more children reported their parents as involved, the more they perceived them as placing value on achievement 6 months later; such perceptions in turn predicted the subsequent value children placed on achievement, which foreshadowed enhanced grades.

Keywords: achievement, engagement, parent involvement, socialization, value transmission

A wealth of research supports the idea that parents' involvement in children's learning enhances children's academic functioning (for reviews, see Grolnick, Friendly, & Bellas, 2009; Pomerantz, Kim, & Cheung, 2012): Children whose parents are involved on the school (e.g., attending parent-teacher conferences) and home (e.g., discussing school with children) fronts often exhibit enhanced engagement (e.g., use of self-regulated strategies), skills (e.g., phonological awareness), and achievement (e.g., grades). Notably, parents' involvement plays a role in children's academic functioning even when aspects of children's home environment such as parents' income and education are taken into account (e.g., Dearing, Kreider, Simpkins, Weiss, 2006; Jeynes, 2005, 2007). The effects of parents' involvement are also not accounted for by other dimensions of parenting such as supporting children's autonomy (e.g., C. S. Cheung & Pomerantz, 2011; Deslandes, Bouchard, & St.-Amant, 1998).

Research focusing on why parents' involvement in children's learning benefits children's academic functioning identifies the

development of children's actual and perceived competencies as important (e.g., Dearing et al., 2006; Senechal & LeFevre, 2002). However, it has also been argued that parents' involvement leads children to view doing well in school as valuable, which fosters children's engagement in school, enhancing their achievement (e.g., Epstein, 1988; Grolnick & Slowiaczek, 1994). Unfortunately, such a value development model has not been tested. The goal of the current research was to address this gap by evaluating whether the effect of parents' involvement on children's engagement and grades in school is due in part to the development of children's values in regard to school achievement. Drawing on prior theory and research on value transmission (i.e., children's adoption of parents' values; e.g., Grusec & Goodnow, 1994; Knafo & Schwartz, 2009) as well as parents' involvement in children's learning (e.g., Hill & Tyson, 2009), we hypothesized two pathways by which parents' involvement facilitates children valuing achievement in school.

The Perception-Acceptance Value Development Pathway

Grusec and Goodnow (1994) proposed a two-step process model by which parents transmit their values to children. First, children must be aware of parents' values such that they perceive them accurately. Second, children must accept parents' values as their own. Both steps are considered key in effective transmission of values from generation to generation (e.g., Barni, Ranieri, Scabini, & Rosnati, 2011; Knafo & Schwartz, 2009). Grusec and Goodnow focused on how the type of discipline parents use with children contributes to value transmission by shaping children's perceptions of parents' values. Several other dimensions of interactions between parents and children, such as parents' discussion of their values with children (e.g., Knafo & Schwartz, 2004;

This article was published Online First July 28, 2014.

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This research was supported by National Institute of Mental Health Grant R01 MH57505. We appreciate the constructive comments on an earlier version of this article provided by members of the Center for Parent Child Studies at University of Illinois, Urbana-Champaign.

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Okagaki & Bevis, 1999) and the quality of children's relationships with parents (Barni et al., 2011), have also received attention. As a commitment of resources (e.g., time, energy, and financial provisions) to children in the academic arena (Grolnick & Slowiaczek, 1994), parents' involvement in children's learning may be a key mechanism by which parents convey to children that they view school as important. When parents take the time and trouble to participate in school events, children may view parents as placing importance on learning. Parents' involvement on the home front may have similar consequences—for example, when parents ask children about what they are learning in school or provide children with learning resources (e.g., books), they may communicate that they see doing well in school as useful.

When children see parents as valuing achievement in school, they may come to value it themselves (e.g., Eccles et al., 1983; Grolnick, Ryan, & Deci, 1997). Grusec and Goodnow (1994) argued that once children are aware of the values parents hold their acceptance of such values as their own is facilitated in the context of a warm relationship with parents (see also Barni et al., 2011). The commitment of resources characteristic of parents' involvement may signal to children that parents care about them. Moreover, in the context of their involvement, parents may provide emotional support for children (e.g., by reacting to children's frustration with homework with soothing words), thereby creating a sense of trust in children that may facilitate their adoption of parents' values (e.g., C. S. Cheung & Pomerantz, 2012; Grolnick & Slowiaczek, 1994; Grusec, 2002). Parents' involvement in children's learning may be a particularly unique dimension of parenting in that it simultaneously communicates the value parents place on doing well in school (Step 1 of Grusec and Goodnow's model), while also leading children to take on this value as their own (Step 2 of Grusec and Goodnow's model). Thus, parents' involvement may enhance children's achievement via a *perception-acceptance pathway*: Parents' involvement leads children to perceive parents as valuing school achievement (path a in Figure 1), thereby heightening the value children themselves place on it (path b in Figure 1).

The Experience Value Development Pathway

The perception-acceptance pathway may be accompanied by what we label an experience pathway that directly fosters the value children place on achievement in school. Although parents' involvement in children's learning likely conveys the value parents' place on children's school endeavors, it may not always lead children to value school achievement via children's awareness of parents' values (Eccles et al., 1983). When parents become involved in children's learning, they may create experiences for children that directly heighten the value children place on school

achievement. For example, when parents discuss school with children, children may generate reasons for its utility, leading them to see doing well in school as valuable (Hill & Tyson, 2009). In a somewhat different vein, drawing from Bem's (1967, 1972) Self-Perception Theory, practices such as helping children to sustain their effort on their homework until it is finished may lead children to conclude that they value doing well in school given how much time they invest in it. In the *experience pathway*, parents' involvement creates experiences that lead children to place value on school achievement (path c in Figure 1), regardless of their perceptions of parents' values.

The Role of Values in Academic Functioning

Whether the value children place on achievement in school ensuing from parents' involvement develops via a perception-acceptance pathway or an experience pathway, prior theory and research (e.g., Eccles et al., 1983; Wang & Pomerantz, 2009) indicates it supports children's academic functioning (see path d in Figure 1). In their Expectancy-Value Theory, Eccles et al. (1983) made the case that when children value achievement in school, they become more engaged in school, which enhances their achievement. Indeed, the more children view doing well in school as important, the more engaged they are—for example, they use heightened self-regulated learning strategies, such as monitoring and planning their learning (e.g., Pintrich, 1999; Wang & Pomerantz, 2009). Notably, heightened value as well as engagement predicts improved achievement among children over time (e.g., Alexander, Entwisle, & Dauber, 1993; Kenney-Benson, Pomerantz, Ryan, & Patrick, 2006; Wang & Pomerantz, 2009).

Value Development Pathways in the United States and China

Over the last several years, there has been a call to extend the understanding of psychological processes beyond Western populations (e.g., Arnett, 2008; Henrich, Heine, Norenzayan, 2010a, 2010b). In the case of parents' involvement in children's learning, this may be of import when it comes to China because Chinese parents are involved differently in children's learning than are their American counterparts (for a review, see Pomerantz, Ng, Cheung, & Qu, in press). For one, Chinese (vs. American) parents are more involved compared to American parents (e.g., Chen & Stevenson, 1989; Ng, Pomerantz, & Lam, 2007). Consequently, both the perception-acceptance and experience value development pathways may be stronger in China than the United States as such heightened involvement may convey more clearly that parents value school achievement and create more experiences that di-

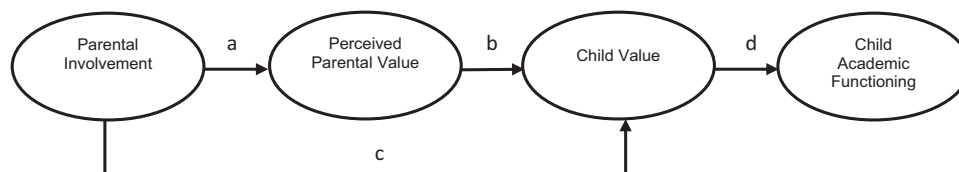


Figure 1. Hypothesized value development pathways underlying the effect of parental involvement on children's academic functioning. The perception-acceptance pathway is reflected in paths a, b, and d; the experience pathway is reflected in paths c and d.

rectly heighten the value children place on school achievement. Moreover, the amplified commitment of resources reflected in parents' involvement may enhance children's adoption of parents' values.

Chinese parents' involvement in children's learning, however, is more controlling than that of American parents with greater attention to children's mistakes (e.g., C. S. Cheung & Pomerantz, 2011; Ng et al., 2007). This along with the tendency for Chinese (vs. American) children to feel less close to parents during adolescence (e.g., Pomerantz, Qin, Wang, & Chen, 2009) may undermine value transmission. Although it is unclear if parents' involvement similarly fosters value development in China and United States, prior examination of the effects of parents' involvement on children's engagement and grades yields similar effects in the two countries (C. S. Cheung & Pomerantz, 2011).

Overview of the Current Research

To examine whether parents' involvement in children's learning enhances children's academic functioning by heightening the value children place on school achievement in the United States and China, the current research evaluated the hypothesis that two value-development pathways underlie the benefits of parents' involvement (see Figure 1). In the *perception-acceptance pathway* (paths a, b, and d), parents' involvement signals to children that parents value school achievement, leading children to value it, which in turn enhances children's achievement. In the *experience*

pathway (paths c and d), parents' involvement develops the value children place on school achievement not through the messages it conveys about parents' values, but rather directly through the experiences it creates. Comparisons between the United States and China for both pathways were made to evaluate their generalizability.

In testing the value transmission pathways, we focused on children in the middle school years because parents' involvement may offset the devaluing of school that often occurs among children during this phase of development (for a review, see Wigfield & Wagner, 2005). Children in the United States and China reported four times over the seventh and eighth grades on parents' involvement in their learning, their perceptions of the value parents place on school achievement, and the value they themselves place on it. Children's academic functioning was assessed with children's reports and school records. The four-wave design allowed for the examination of the sequence of effects posited in Figure 1. Because each construct was assessed at each wave, autoregressive effects could be taken into account (see Figure 2), which permitted identification of the direction of effects.

We investigated two dimensions of children's academic functioning that have important implications for children's lives. First, children's *engagement* in school is not only predictive of their achievement over time (e.g., M.-T. Wang & Fredricks, 2014; Q. Wang & Pomerantz, 2009) but also appears to protect children against internalizing and externalizing problems (e.g., M.-T. Wang

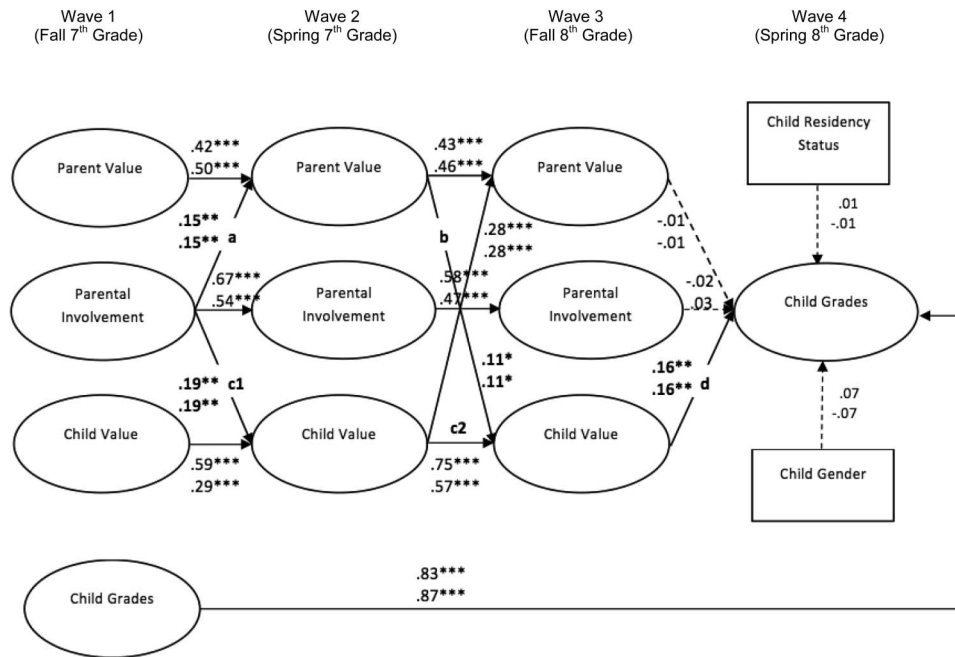


Figure 2. Value development pathways underlying the effect of parents' involvement on children's grades. For child gender, 1 = boys, 2 = girls; for child residency with parents, 1 = not residing with both parents, 2 = residing with both parents. Letters (i.e., a, b, c1, c2, and d) represent links comprising the two value development pathways denoted in Figure 1. For ease of presentation, within-wave covariances are not shown. Based on the chi-square difference tests, all paths comprising the indirect pathways were constrained to be equal between the United States and China. American standardized estimates are above; Chinese standardized estimates are below. Solid lines are significant ($p < .05$); dashed lines are not. * $p < .05$. ** $p < .01$. *** $p < .001$.

& Fredricks, 2014; M.-T. Wang & Peck, 2013). Children reported on two forms of their engagement—their use of self-regulated learning strategies and the time they spend on schoolwork outside of school. Second, children's *grades* in school are a significant reflection of their achievement (Duckworth & Seligman, 2005; Grolnick et al., 1997) with implications for subsequent opportunities (e.g., placement in enrichment activities) as well as success later in life (e.g., Geiser & Santelices, 2007). There is sizeable evidence documenting the importance of parents' involvement in children's learning for both children's engagement and grades (e.g., C. S. Cheung & Pomerantz, 2011; Grolnick & Slowiaczek, 1994).

With the exception of grades, children provided reports for all the constructs under study. This is of particular concern when it comes to parents' involvement in children's learning. Children's reports of such involvement are only modestly associated with teachers and parents' reports (e.g., Bakker, Denessen, & Bruslaeven, 2007; Hill et al., 2004; Reynolds, 1992). However, because children, teachers, and parents' reports of parents' involvement each predict unique variance in children's achievement, it has been argued that each captures unique aspects of parents' involvement (Reynolds, 1992). Children's reports reflect their *perceptions* of parents' involvement. This is significant because children must notice parents' involvement to draw conclusions about parents' values (C. S. Cheung & Pomerantz, 2012; Grolnick & Slowiaczek, 1994). However, each reporter may also bring a unique set of biases to their reports. In the current context, the value children view parents placing on school achievement or that they themselves place on it may bias their reports, such that effects reflect children's perceptions of parents' values or their own values rather than parents' involvement. To rule out this possibility, we tested alternative pathways—for example, the value children place on school achievement predicts their reports of parents' involvement over time.

Method

Participants

The University of Illinois U.S.-China Adolescence Study began when children entered a new school in seventh grade and concluded at the end of eighth grade in the United States and China (e.g., Pomerantz et al., 2009; Wang & Pomerantz, 2009). Participants were 374 American children (187 boys; M age = 12.78 years in the fall of seventh grade) and 451 Chinese children (240 boys; M age = 12.69 years in the fall of seventh grade). In each country, children attended public school in primarily working- or middle-class areas. The American children attended one of two public schools consisting of the seventh and eighth grades in the suburbs of Chicago. Chicago is a city with high population density (12,750 people per square mile at the time of the research) with a median yearly family gross income of \$61,182 at the time of the research; 30% of the population over the age of 25 possessed at least a college degree at the time of the research (U.S. Census Bureau, 2007). The median family income of the two selected suburbs was \$60,057 and \$72,947, with 21% and 26% of the population over the age of 25 possessing a college degree. Reflecting the ethnic composition of these areas, participants were predominantly European American (88%) with 9% Hispanic American, 2% African

American, and 1% Asian American. Seventy-nine percent of participating children reported living with two parents.

The Chinese children attended one of two public schools in the suburbs of Beijing; one school consisted of the seventh to ninth grades and the other of the seventh to 12th grades. According to the Beijing Municipal Bureau of Statistics (2005), Beijing is a densely populated city (13,386 people per square mile at the time of the research) with an annual discretionary income per capita of \$15,638 RMB at the time of the research; 13% of the population over the age of 6 had at least a college degree at the time of the research. In the two selected suburbs, 9% and 28% of the population over the age of 6 had a college degree. Over 95% of the residents in these areas were of the *Han* ethnicity (Beijing Municipal Bureau of Statistics, 2005), which is slightly above the 92% for the country as a whole (China Population and Development Research Center, 2001). Eighty-six percent of the participating children reported living with two parents. An opt-in consent procedure was used in which parents provided permission for children to participate. Sixty-four percent of parents in the United States and 59% of parents in China allowed their children to participate.

Procedure

Children completed a set of questionnaires during two 45-min sessions at four times approximately 6 months apart: fall of seventh grade (Wave 1), spring of seventh grade (Wave 2), fall of eighth grade (Wave 3), and spring of eighth grade (Wave 4). Instructions and items were read aloud to children in their native language in the classroom during regular class time by trained native research staff. Children received a small gift (e.g., a calculator) as a token of appreciation at the end of each session. The average attrition rate over the entire study was 4% (2% in the United States and 6% in China). More than 85% of the children had data at all four waves of the study for all of the analyses, with more than 98% having data at two or more waves for all of the analyses. At Wave 1, children with complete data differed from those without complete data only in that their grades were better, $t(818) = 2.01, p < .05$. The Institutional Review Boards of the University of Illinois and Beijing Normal University approved the procedures.

Measures

The measures were originally written in English. Standard translation and back-translation procedures (Brislin, 1980) were employed with repeated discussion among American and Chinese members of the research team to modify the wording of the items to ensure equivalence in meaning between the English and Chinese versions (Erkut, 2010). Equivalence was also established statistically. A series of confirmatory factor analyses (CFAs) was conducted in the context of two-group nested structural equation modeling (SEM) to examine the metric invariance of the measures between the United States and China over the four waves of the study; metric invariance is essential and sufficient in making valid comparisons of the associations (e.g., Little, 1997), as was done in the current research (see below).

In each set of CFAs, an unconstrained model was compared to a constrained (i.e., metric invariance) model. The unconstrained models consisted of the same latent construct repeatedly assessed

over the four waves yielding a total of four latent constructs. These constructs were allowed to correlate with one another; errors of the same indicators over time were also allowed to correlate when suggested by modification indexes from the CFAs conducted on the sample with no missing data (Keith, 2006; McDonald & Ho, 2002). The parameters in the unconstrained models were freely estimated without any between-country or across-time equality constraints. In the constrained models, the factor loadings of the same indicators were forced to be equal between the two countries and across the four waves. Monte Carlo studies indicate that a decrease from the unconstrained to the corresponding constrained model in the comparative fit index (CFI) of no more than .01, supplemented by an increase in the root-mean-square error of approximation (RMSEA) of no more than .015, is reflective of invariance (Chen, 2007). Although chi-square difference tests are considered appropriate for hypothesis testing purposes, the current consensus is that they are not appropriate for evaluating measurement invariance (e.g., Chen, 2007; G. W. Cheung & Rensvold, 2002; Little, 1997).

Prior analyses on these data, using two parcels of items (or two items in the case of time spent on homework outside of school) to represent each latent construct indicated that the measures of parents' involvement in children's learning, the value children place on school, and children's engagement have metric invariance between countries and over time (C. S. Cheung & Pomerantz, 2011; Wang & Pomerantz, 2009). The use of parcels allowed us to build parsimonious models based on solid and meaningful indicators, enhancing the likelihood of replication in future research (Little, Cunningham, Shahar, & Widaman, 2002; Little, Rhemtulla, Gibson, & Schoemann, 2013). Parsimony was of particular concern in the current research given the sizeable number of items comprising each scale and the complexity of the models, which can strain the number of free parameters that can be estimated (e.g., Kline, 1998), despite our sample size of 825. In such a case, the use of parcels is desirable (Little et al., 2013). Importantly, principal components analysis (PCA) on each set of items comprising each parcel indicated that each set formed a single factor; the parcels were also each internally reliable on their own ($\alpha = .73$ to $.88$).

Metric invariance of children's perceptions of the value parents place on school achievement has not been evaluated in prior analyses; thus, it was tested for the current research. The latent construct was represented by two parcels of items: Items about the importance of doing well were aggregated in one parcel, which PCA indicated formed a single factor ($\alpha = .80$ to $.93$; see item descriptions below), and items about the importance of not doing poorly were aggregated in another, which PCA indicated form a single factor as well ($\alpha = .84$ to $.92$). Both the unconstrained, $\chi^2(df = 9) = 26.10$, CFI = $.95$, Tucker-Lewis index (TLI) = $.92$, RMSEA = $.08$, and constrained, $\chi^2(df = 13) = 38.12$, CFI = $.95$, TLI = $.92$, RMSEA = $.07$, models fit the data adequately, with differences between the CFIs and RMSEAs of no more than $.01$.

Parental involvement in child learning. Parents' involvement in children's learning was assessed with 10 items (e.g., "My parents help me with my homework when I ask." "My parents try to get to know the teachers at my school." "My parents purchase extra workbooks or outside materials related to school for me.") adapted from prior research (Chao, 2000; Kerr & Stattin, 2000; Kohl, Lengua, McMahon, & The Conduct Problems Prevention

Research Group, 2000; Stattin & Kerr, 2000). In line with Grolnick and Slowiaczek's (1994) definition of parents' involvement, the items characterize a variety of practices (e.g., attendance of parent-teacher conferences, discussion of school with children, and assistance with homework) reflecting parents' commitment of resources to children in the academic arena. Children indicated the extent to which each of the statements was true (1 = *not at all true*, 5 = *very true*). The 10 items were combined, with higher numbers reflecting greater involvement as reported by children ($\alpha = .83$ to $.85$ in the United States and $.77$ to $.83$ in China).

Child perceptions of parental value. To assess children's perceptions of the value their parents place on school achievement, children indicated how important (1 = *not at all important*, 7 = *very important*) it is to parents that they do well (e.g., "How important is it to your parents that you do well in language arts?") and avoid doing poorly (e.g., "How important is it to your parents that you avoid doing poorly in math?") on four core subjects (language arts, math, science, and social studies in the United States; language arts, math, biology, and English in China) for which children received grades. The eight items were combined, with higher numbers reflecting perceptions of greater parental value ($\alpha = .93$ to $.96$ in the United States and $.87$ to $.91$ in China).

Child value. The value children themselves place on school achievement was assessed with a modified version of Pomerantz, Saxon, and Oishi's (2000) measure. Paralleling the measure of children's perceptions of the value parents place on school achievement, for each of the four core subjects, children indicated how important (1 = *not at all important*, 7 = *very important*) it was for them to do well (e.g., "How important is it to you to do well in math?") and avoid doing poorly (e.g., "How important is it to you to avoid doing poorly in language arts?"). The eight items were combined, with higher numbers reflecting greater value ($\alpha = .91$ to $.94$ in the United States and $.88$ to $.91$ in China).

Child engagement. Two forms of children's engagement in school were assessed. The 30-item Dowson and McInerney (2004) Goal Orientation and Learning Strategies Survey assessed children's use of *self-regulated learning strategies*. Three scales assess children's metacognitive strategies: Six items assess monitoring (e.g., "I check to see if I understand the things I am trying to learn"), six assess planning (e.g., "I try to plan out my schoolwork as best as I can"), and six assess regulating (e.g., "If I get confused about something at school, I go back and try to figure it out"). Two scales assess children's cognitive strategies: Six items assess rehearsal (e.g., "When I want to learn things for school, I practice repeating them to myself") and six assess elaboration (e.g., "I try to understand how the things I learn in school fit together with each other"). Children indicated the extent to which each of the 30 statements was true of them (1 = *not at all true*, 5 = *very true*). The metacognitive and cognitive strategies scales were combined, with higher numbers representing greater school engagement ($\alpha = .96$ to $.97$ in the United States and $.93$ to $.96$ in China).

The *time children spend on schoolwork outside of school* was assessed with a modified version of the scale used by Fuligni, Tseng, and Lam (1999). Children indicated how much time they spend on their schoolwork outside of school on a typical weekday and weekend (1 = *less than 1 hr*, 6 = *more than 5 hr*). Their responses for a typical weekday were weighted by five and combined with those of each day for a typical weekend weighted by two. Higher numbers reflect more time spent on schoolwork out-

side of school ($r_s = .48$ to $.64$ in the United States and $.41$ to $.52$ in China).

Child grades. Children's grades in the four core subjects were obtained from schools. Grades in the American schools were originally in letters and were converted to numbers. Because there were 13 steps in the ladder of grades used in the American schools, grades were converted to numbers with a range of 0 (i.e., a grade of F) to 12 (i.e., a grade of A+) with a 1-point increment between each step in the grades (e.g., B- = 7, B = 8, B+ = 9, A- = 10). Such conversion has been used in prior research (e.g., Coe, Pivarnik, Womack, Reeves, & Malina, 2006; Schwartz, Kelly, & Duong, 2013; Wood & Locke, 1987). Moreover, simulation research indicates that the treatment of discrete categories as continuous is unlikely to result in biased parameter estimates when the number of categories is more than six as is the case in the current research (Rhemtulla, Brosseau-Liard, & Savalei, 2012). In the Chinese schools, grades were originally numerical, ranging from 0 to 100 in one school and from 0 to 120 in the other. In both countries, grades were standardized within school to take into account differences in the grading systems of the schools. The four subjects were combined, with higher numbers reflecting better grades.

Results

Overall, the measures in the current research were approximately normally distributed. In both the United States and China across the four waves of assessment, the indexes for skewness and kurtosis were less than 1, with only one exception—the index for

skewness was 1.47 and the kurtosis index was 2.28 for the avoidant dimension of the value children place on school achievement at Wave 1 in the United States. Hence, across the six measures at each of the four waves there was no indication of serious violation of the normality assumption.

As shown in Table 1, in both the United States and China, parents' involvement in children's learning—as reported by children—was positively associated with children's perceptions of the value parents place on school achievement ($r_s = .25$ to $.43$, $p_s < .001$) as well as the value children themselves place on it ($r_s = .25$ to $.39$, $p_s < .001$) at each wave. Children's perceptions of the value parents place on school achievement were positively associated at each wave with the value children place on it ($r_s = .28$ to $.55$, $p_s < .001$). The value children place on school achievement was also associated with their engagement ($r_s = .30$ to $.58$ for self-regulated learning strategies and $.13$ to $.21$ for time spent on school schoolwork outside of school; $p_s < .05$) as well as grades ($r_s = .22$ to $.38$, $p_s < .001$) at each wave in the United States and China. Although such associations are suggestive of the viability of both the perception-acceptance and experience value development pathways, they do not provide insight into the direction of effects. Evaluation of the direction of effects requires analyses accounting for the autoregressive effects.

The central analyses took such effects into account. These analyses were conducted within a latent SEM framework using Mplus 7.0 (Muthén & Muthén, 1998–2012), which employs full information maximum likelihood (FIML) estimation in the presence of missing data; FIML provides more reliable standard errors

Table 1
Means and Correlations Among the Central Constructs

| Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|-----|-----|-----|-----|
| Parental involvement | | | | | | | | | | | | | | | | |
| 1. Wave 1 | — | .50 | .54 | .46 | .25 | .24 | .25 | .27 | .27 | .24 | .18 | .19 | .01 | .04 | .07 | .10 |
| 2. Wave 2 | .64 | — | .59 | .55 | .26 | .35 | .29 | .26 | .26 | .32 | .26 | .28 | .04 | .05 | .06 | .06 |
| 3. Wave 3 | .51 | .60 | — | .63 | .15 | .27 | .34 | .26 | .16 | .28 | .25 | .27 | .07 | .10 | .11 | .12 |
| 4. Wave 4 | .48 | .45 | .48 | — | .15 | .29 | .26 | .33 | .12 | .26 | .24 | .27 | .05 | .05 | .09 | .11 |
| Perceived parental value | | | | | | | | | | | | | | | | |
| 5. Wave 1 | .31 | .27 | .21 | .28 | — | .39 | .38 | .34 | .51 | .28 | .28 | .21 | .05 | .03 | .10 | .12 |
| 6. Wave 2 | .34 | .43 | .27 | .22 | .41 | — | .53 | .48 | .32 | .43 | .39 | .41 | .11 | .12 | .16 | .15 |
| 7. Wave 3 | .30 | .32 | .38 | .29 | .39 | .52 | — | .57 | .33 | .44 | .55 | .50 | .12 | .16 | .17 | .17 |
| 8. Wave 4 | .21 | .16 | .24 | .38 | .34 | .36 | .54 | — | .31 | .40 | .46 | .49 | .09 | .12 | .12 | .13 |
| Child value | | | | | | | | | | | | | | | | |
| 9. Wave 1 | .38 | .30 | .28 | .21 | .28 | .28 | .33 | .24 | — | .49 | .43 | .37 | .28 | .26 | .24 | .30 |
| 10. Wave 2 | .44 | .39 | .36 | .26 | .28 | .41 | .43 | .30 | .67 | — | .61 | .59 | .36 | .38 | .31 | .39 |
| 11. Wave 3 | .38 | .33 | .35 | .27 | .22 | .36 | .47 | .38 | .58 | .73 | — | .67 | .27 | .33 | .29 | .31 |
| 12. Wave 4 | .31 | .32 | .34 | .33 | .20 | .31 | .46 | .41 | .55 | .65 | .75 | — | .27 | .28 | .27 | .32 |
| Grades | | | | | | | | | | | | | | | | |
| 13. Wave 1 | .09 | .13 | .22 | .14 | -.03 | .01 | .12 | .13 | .28 | .20 | .20 | .31 | — | .91 | .82 | .88 |
| 14. Wave 2 | .12 | .15 | .22 | .16 | -.01 | .05 | .11 | .13 | .28 | .22 | .27 | .33 | .92 | — | .86 | .91 |
| 15. Wave 3 | .11 | .15 | .22 | .15 | .03 | .07 | .14 | .12 | .26 | .24 | .31 | .35 | .82 | .87 | — | .88 |
| 16. Wave 4 | .12 | .15 | .20 | .16 | .00 | .10 | .13 | .16 | .30 | .27 | .35 | .38 | .80 | .84 | .92 | — |
| Mean (U.S.) | 3.61 | 3.44 | 3.43 | 3.37 | 6.38 | 6.14 | 6.09 | 6.10 | 5.65 | 5.29 | 5.35 | 5.29 | | | | |
| SD (U.S.) | 0.71 | 0.80 | 0.76 | 0.76 | 0.79 | 1.07 | 1.05 | 1.11 | 1.10 | 1.18 | 1.25 | 1.29 | | | | |
| Mean (China) | 3.79 | 3.69 | 3.67 | 3.64 | 6.00 | 6.10 | 6.08 | 6.05 | 5.91 | 5.82 | 5.78 | 5.74 | | | | |
| SD (China) | 0.62 | 0.71 | 0.68 | 0.68 | 0.94 | 0.92 | 0.94 | 0.94 | 0.88 | 1.08 | 1.08 | 1.13 | | | | |

Note. Results are based on the observed, rather than latent, variables. Correlations for the American sample are presented in the lower triangle; those for the Chinese sample are presented in the upper triangle. Correlations with absolute values greater than .10 are significant ($p < .05$). Grades were standardized within schools with means equal to zero and standard deviations equal to one; the other dimensions of academic functioning were not included given space limitations, but information on them may be obtained by contacting the first author (see also the Results section).

to handling missing data under a wider range of conditions than does not only list- and pairwise deletion but also mean-imputation (Arbuckle, 1996; Wothke, 2000). To identify differences between the United States and China, two-group nested model comparisons were employed: The unconstrained models were compared to more parsimonious models with constraints of equal coefficients imposed between the two countries on the effects of interest; for each set of models, the constraints were imposed one by one and then simultaneously. A significant difference ($\Delta\chi^2$) between an unconstrained model and a more parsimonious constrained model indicates a country difference. The same two parcels or items used in the CFAs conducted to establish measurement invariance (see the Method section) were employed for the latent constructs in the model; for grades, the four subjects were each used as indicators of the latent construct. A separate set of models was conducted for each dimension of academic functioning.

Prior research using this data set already established the total effects of parents' involvement on children's engagement and grades over time. C. S. Cheung and Pomerantz (2012) conducted sets of two-group nested SEM analyses examining if parents' involvement is predictive of children's academic functioning over the four waves (see also C. S. Cheung & Pomerantz, 2011): The effect of parents' involvement at Wave 1 on children's academic functioning (i.e., engagement and grades) at Wave 4 was evaluated, taking into account residual variance by adjusting for children's earlier (Wave 1) academic functioning as well as allowing the variance of parents' involvement and children's academic functioning at Wave 1 to correlate. The unconstrained, $\chi^2s(df > 5) < 3.91$, CFIs $> .96$, TLIs $> .95$, RMSEAs $< .05$, and constrained, $\chi^2s(dfs = 4) = 1.67$, CFIs $> .96$, TLIs $> .96$, RMSEAs = .04, models fit the data well, with the effects similar in the United States and China, $\Delta\chi^2s(df = 1) < 1.5$. The more involved parents were in children's learning, the more children were engaged ($\gamma = .15$ for self-regulated learning strategies and .08 for time spent on schoolwork; $ts > 2.66$, $ps < .01$), and the better their grades ($\gamma = .07$; $t = 3.01$, $p < .01$) 2 years later over and above their earlier engagement and grades.

In the current report, we used two-group nested SEM analyses to identify the role of the two value development pathways (i.e., the perception-acceptance and experience pathways) in explaining the effects of parents' involvement on children's academic functioning. As shown in Figure 2, children's reports of parents' involvement at Wave 1 were specified to predict children's perceptions of the value parents place on school achievement (i.e., the

first step of the perception-acceptance pathway, path a in Figures 1 and 2) and the value children themselves place on school (i.e., the first step of the experience pathway, path c in Figure 1 and c1 in Figure 2) at Wave 2. For the perception-acceptance pathway, children's perceptions of parents' values at Wave 2 were specified to predict their own values at Wave 3 (path b in Figures 1 and 2), which in turn were specified to predict children's academic functioning at Wave 4 (path d in Figures 1 and 2). For the experience pathway, the value children place on school achievement at Wave 2 was specified to predict the maintenance of such value at Wave 3 (path c2 in Figure 2), which in turn was specified to predict their academic functioning at Wave 4 (path d in Figures 1 and 2).

The mediating roles of the two pathways were simultaneously evaluated to assess the unique effects of each. Residual variance for each of the downstream constructs was taken into account. Specifically, as shown in Figure 2, corresponding constructs assessed 6 months prior to each of the constructs specified in the pathways were included to take into account autoregressive effects. Concurrent associations between constructs were also taken into account by allowing the variances (Wave 1) or error variances (Wave 2, 3, and 4) of the constructs to correlate within each wave. Because children's residence in single-headed household as well as their gender are associated with children's achievement during middle school (e.g., Downey, 1994; Dwyer & Johnson, 1997; Entwisle, 1997), children's reports of whether they reside with both parents in the same household (1 = *not residing with both parents*, 2 = *residing with both parents*) and their gender (1 = *boys*, 2 = *girls*) were included as covariates by specifying them to predict children's grades at Wave 4.

The unconstrained models (i.e., individual models for self-regulated learning strategies, time spent on schoolwork outside of school, and grades) fit the data adequately, $\chi^2s(dfs > 319) = 1080$, CFIs $> .94$, TLIs $> .92$, RMSEAs $< .08$. Two-group nested model comparisons indicated that the links comprising both the perception-acceptance and experience pathways were similar in the United States and China, $\Delta\chi^2s(dfs = 1) < 2.2$, *ns*; thus, all such effects were constrained to be equal between the two countries in the final constrained models, $\chi^2s(dfs > 314) > 1069$, CFIs $> .96$, TLIs $> .94$, RMSEAs $< .07$. As shown in Table 2 and Figure 2, there was support for the perception-acceptance pathway. Children's reports of parents' involvement at Wave 1 predicted children's perceptions of the value parents place on school achievement at Wave 2 taking into account children's earlier (Wave 1) perceptions ($ts = 2.96$, $ps < .01$). In turn, the more

Table 2
Summary of Model Fit and Parameter Estimates for the Value Development Models

| Dimension of academic functioning | Model fit | | | Estimates | | | Delta coefficient | |
|-----------------------------------|-----------|-----|-------|-------------------------------------|-------------------------------------|-----------------------------------|-------------------------------|--------------------|
| | CFI | TLI | RMSEA | Path a (Involvement → Parent Value) | Path b (Parent Value → Child Value) | Path c (Child Value → Adjustment) | Perception-Acceptance Pathway | Experience Pathway |
| Grades | .95 | .94 | .07 | .15** | .11** | .16*** | 2.08* | 3.38** |
| SRL | .96 | .94 | .07 | .24*** | .17** | .19*** | 2.21* | 5.48*** |
| Time on schoolwork | .94 | .94 | .07 | .23*** | .19** | .10** | 1.81† | 4.55*** |

Note. CFI = comparative fit index; TLI = Tucker–Lewis index; RMSEA = root-mean-square error of approximation; SRL = self-regulated learning. Based on the chi-square difference tests, all paths comprising the indirect pathways were constrained to be equal between the United States and China. Estimates from the final constrained models are reported.
 † $p < .06$. * $p < .05$. ** $p < .01$. *** $p < .001$.

children perceived parents as valuing school achievement at Wave 2, the more they themselves valued it at Wave 3 taking into account the earlier (Wave 2) value children placed on school achievement ($ts = 2.02, ps < .05$). The value children placed on school achievement at Wave 3 predicted enhanced engagement ($ts > 3.10, ps < .01$) and grades ($ts = 4.92, ps < .001$) among children at Wave 4 over and above their earlier (Wave 1) engagement and grades. Notably, at Wave 3, neither parents' involvement nor children's perceptions of the value parents place on school achievement uniquely predicted children's engagement or grades ($ts < 1$). Thus, although the value children placed on school achievement predicted their subsequent perceptions of the value parents place on it (see Figure 2), this was not a viable pathway by which parents' involvement benefits children's academic functioning.

There was also support for the experience pathway (see Figure 2 and Table 2). Parents' involvement as reported by children at Wave 1 predicted the value children themselves placed on school achievement at Wave 2 taking into account children's earlier (Wave 1) value ($ts = 2.08, ps < .05$). The value children placed on school achievement was maintained over time—that is from Wave 2 to 3 ($ts = 6.28, ps < .01$), which, as reported above, predicted children's engagement and grades at Wave 4.

The total effects of parents' involvement (Wave 1) on children's academic functioning (Wave 4) were no longer evident in either country ($\gamma s < .03$) with the inclusion of the value development pathways, which resulted in a reduction of at least 65% of the total effect for each of the three dimensions of children's academic functioning. Mplus's delta method indicated that the two-step perception-acceptance pathway was significant in the United States and China in explaining the role of involvement in children's engagement as reflected in their self-regulated learning strategies ($zs > 2.21, ps < .05$) and grades ($zs > 2.08, ps < .05$). For engagement, as reflected in children's time spent on schoolwork outside of the school, the perception-acceptance pathway was marginal ($zs = 1.81, ps < .06$). The one-step experience pathway was evident across all three dimensions of children's academic functioning ($zs > 3.38, ps < .01$). These results are consistent with those yielded by analyses using bootstrap resampling techniques. For example, in the model focusing on grades as the final outcome, the estimate of the perception-acceptance pathway via perceptions of parental value and child value using 5,000 bootstrap resamples was .004 (95% CI = .001, .009), and that of the experience pathway was .017 (95% CI = .001, .042).

The model examined also allowed us to test the viability of alternative pathways—for example, the possibility that the value children place on school achievement leads them to report parents as more involved over time, which in turn leads children to view parents as more invested in their achievement, thereby enhancing children's academic functioning. To examine these alternative explanations, we evaluated the role of all possible pathways in the link between parents' involvement and children's academic functioning, including the value development pathways, simultaneously in the same model. The unconstrained, $\chi^2 s$ ($dfs > 360$) = 1203, CFIs $> .92$, TLIs $> .90$, RMSEA = .08, and constrained, $\chi^2 s$ ($dfs > 350$) = 1191, CFIs $> .92$, TLIs $> .90$, RMSEAs $< .08$, models fit the data adequately. When simultaneously evaluated in the model with the two value development pathways, none of the alternative pathways (out of six possible pathways) was evident

($zs < 1.10, ns$). However, the two value development pathways remained significant ($zs > 2.10, ps < .05$), reflecting their uniqueness. Although none of the alternative pathways were evident, one link comprising one of them was: In both countries, children's value at Wave 2 was predictive of their perceptions of parents' value at Wave 3, adjusting for children's earlier perceptions ($\gamma s = .25-.28, ts > 2.78, ps < .05$).

Discussion

The current research is the first empirical test of one of the most frequently proposed pathways—that is, value development—argued to underlie the benefits of parents' involvement in children's learning (e.g., Epstein, 1988; Grolnick & Slowiaczek, 1994). Consistent with the two-step value transmission model put forth by Grusec and Goodnow (1994), there was evidence for a *perception-acceptance pathway*: The more involved parents were—as reported by children—the more children perceived them as placing heightened value on school achievement; this, in turn, was predictive of children coming to value school achievement more over time. In line with ideas that parents' involvement may create experiences that foster value development among children (e.g., Hill & Tyson, 2009), there was also evidence that parents' involvement contributes directly to the value children place on school achievement (i.e., the *experience pathway*). Both pathways uniquely accounted for the beneficial effect of parents' involvement on children's later academic functioning (i.e., engagement and grades).

The effects of the two value development pathways were robust in that they remained even when alternative pathways were taken into account (e.g., the more children value school achievement, the more they see parents as valuing it, which heightens children's reports of parents' involvement, thereby enhancing their achievement); the value development pathways were also not due to children's gender or residence with both (vs. one) parent, which have been linked to children's achievement (e.g., Downey, 1994; Dwyer & Johnson, 1997; Entwisle, 1997). Although comparable to those of prior research using stringent statistical controls to identify indirect pathways over time (e.g., Davies, Woitach, Winter, & Cummings, 2008; NICHD Early Child Care Research Network, 2003), the effects of the value development pathway were modest—perhaps because value development has been underway for some time once children reach adolescence with only incremental change occurring at this time. Even modest effects, however, may be critical to offsetting the devaluing of school that often occurs among children over adolescence (for a review, see Wigfield & Wagner, 2005). Moreover, incremental change can be meaningful as it may accumulate over time (Pomerantz, Qin, Wang, & Chen, 2011). Moderation may also contribute to the modest effects. For example, drawing from Grusec and Goodnow (1994), when children have poor relationships with parents, parents' involvement in their learning may be less likely to lead them to take on parents' values as their own.

Increasingly research has focused on understanding the processes underlying the benefits of parents' involvement in children's learning for children's academic functioning (for a review, see Pomerantz et al., 2012). In this vein, children's actual and perceived competencies have been identified as important mechanisms (e.g., Dearing et al., 2006; Senechal & LeFevre, 2002).

Although it is possible that such mechanisms are distinct from the value development pathways identified in the current research, it is also possible that they work together. Value development may establish the foundation for growth in children's competencies: Once children come to see achievement in school as personally important, they may be more receptive to parents' instruction, which may develop their competencies, thereby allowing them to feel confident. Other mechanisms may also be a part of the value development pathways. For example, C. S. Cheung and Pomerantz (2012) found that the effect of parents' involvement on children's achievement was due in part to children adopting parent-oriented reasons (e.g., to meet parents' expectations) for school achievement; such motivation may be particularly likely to develop once children see parents as valuing school achievement, ultimately leading children to view achievement as personally important so that they may do well to satisfy parents who have committed substantial resources to their learning.

Despite differences in the quantity and quality of American and Chinese parents' involvement in children's learning (for reviews, see Chao & Tseng, 2002; Pomerantz, Ng, & Wang, 2008), the value development pathways were similarly evident in the United States and China. Although Chinese parents tend to accompany their involvement in children's learning with control more than do American parents (e.g., C. S. Cheung & Pomerantz, 2011), the more parents were involved, the more children viewed them as valuing school achievement and valued it themselves in both the United States and China. Moreover, children's perceptions of the value parents place on school achievement were similarly predictive over time of the value children themselves placed on it in the two countries. Thus, it appears that regardless of the quantity or quality, parents' involvement in children's learning may be a unique dimension of parenting in that it conveys parents' values while also having characteristics such as emotional support that may increase the accuracy of children's perceptions of such values as well as their acceptance of them.

The current research was guided by Grusec and Goodnow's (1994) two-step process model by which parents transmit their values to children. However, it diverged from the model in that the actual value parents place on school achievement was not directly assessed, but rather assumed to be reflected in parents' involvement in children's learning. Although parents' values likely drive their involvement, so do other forces—for example, children's invitations to be involved, parents' beliefs about their capacity to support children's learning, and whether parents see it as their role to be involved (for a review, see Hoover-Dempsey & Sandler, 1997). The current research did not examine the *accuracy* of value transmission, but rather what parents' involvement conveyed to children about the value parents' place on achievement in school. It is of note that the value parents place on children's school achievement may not be conveyed if parents are not involved. Hence, simply valuing school achievement may not reap the same benefits as being involved.

Limitations

Several limitations should be considered in interpreting the results. Perhaps most significantly, with the exception of grades, children served as the sole reporters. To rule out informant bias,

our model controlled for the concurrent associations between the child-reported constructs as well as the stability of each over time as both these links are likely to contain informant bias. Given such controls, the value development pathways are unlikely to contain informant bias. However, we went further in ruling out the possibility of other pathways that could result in bias due to children's reports—for example, we ensured that the effects were not simply due to children's values driving their reports of parents' values and involvement. Despite the merits of using multiple informants, it was crucial that children report on both their perceptions of the value parents place on school as well as the value they themselves place on school given that these constructs represent children's beliefs to which they likely have the best access. Yet, because children's reports of parents' involvement are only modestly associated with parents and teachers' reports (e.g., Bakker et al., 2007; Hill et al., 2004; Reynolds, 1992), it will be important for future research to examine the value development pathways using parents and teachers' reports.

The current research also did not distinguish between mothers and fathers' involvement, asking children instead to report on involvement as practiced by parents as a single entity. It is quite possible that mothers and fathers are differentially involved reflecting differences in their time and values. For example, Roest, Dubas, Gerris, and Engels (2009) reported only modest correspondence between Dutch mothers and fathers' values in terms of such things as the importance of pursuing happiness and working hard. Research in the United States indicates that mothers and fathers' involvement in children's learning does not necessarily overlap—for example, mothers are often more likely than fathers to attend school events and assist children with homework (Nord & West, 2001). Future research should examine if mothers and fathers' involvement differentially guides value development among children. Attention should also be given to the moderating role of the consistency between mothers and fathers in their values and involvement because when there is more agreement between parents in their values, children often have more accurate perceptions of parents' values (Knafo & Schwartz, 2004).

Given their homogeneity (e.g., the American sample was mainly of European descent and the Chinese sample was mainly of *Han* descent), the samples used in the current research do not represent the diversity of the United States and China. Thus, questions remain concerning within-culture variations in the role of value development in the effect of parents' involvement in children's learning. Within the United States, there is some evidence that how parents are involved varies demographically (e.g., Hill & Taylor, 2004; Snyder & Dillow, 2012). For example, the more educated parents are, the more they take part in events at children's school (Snyder & Dillow, 2012). It is possible that different types of involvement convey different messages about the value parents' place on school (e.g., those that children see as taking more time and energy indicate most that parents view school as important). Of additional concern, is that urban areas such as Beijing in China have been increasingly exposed to Western values in the past few decades. Thus, it is possible that the Chinese children in the current research interpret parents' involvement more similarly to American children than do Chinese children residing in rural areas.

Conclusions

Despite these limitations, the current research is of import in providing empirical support for a value development model of the effects of parents' involvement in children's learning: Such involvement appears to benefit children in part because it leads children to view school achievement as valuable, which heightens their engagement in school, ultimately enhancing their grades. Via a perception-acceptance pathway, when parents become involved in children's learning, children perceive parents as placing heightened value on achievement in school; such perceptions in turn foreshadow children viewing achievement in school as personally important. In an experience pathway, parents' involvement foreshadows children placing heightened value on school achievement presumably due to the experiences created by parents' involvement (e.g., discussion about school allows children to generate reasons for its utility), which in turn predicts enhanced academic functioning among children. These value development pathways were similarly evident in the United States and China where the quantity and quality of parents' involvement differ.

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Received March 14, 2013
 Revision received June 11, 2014
 Accepted June 17, 2014 ■

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