

## Relations Among Cultural Learning Beliefs, Self-Regulated Learning, and Academic Achievement for Low-Income Chinese American Adolescents

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This mixed-methods study of urban low-income, English-proficient Chinese American, second-generation 15-year-olds (conducted in 2004;  $N = 32$ ) examined the relation among the virtue model of learning communicated by parents and adolescents' learning beliefs, self-regulated learning (SRL) behaviors, and academic achievement. Analysis of in-depth individual interviews revealed that for these adolescents, perceptions of family educational socialization predicted students' endorsement of their culture's virtue-oriented learning beliefs and that adolescents' endorsement of these learning beliefs predicted their academic achievement. Importantly, adolescents' reported that use of SRL strategies mediated the relationship between their endorsement of virtue-oriented learning beliefs and their academic achievement. Findings are discussed in the context of further research linking cultural learning beliefs, SRL, and children's academic achievement.

There is no doubt that immigrant parents, who now account for 13% of the U.S. population, encounter multiple and unique stressors that affect their well-being and parenting strategies (Hand & Gresalfi, 2015). These include language and cultural barriers, acculturation discrepancy, and the loss of support networks of family and friends (Bang, 2015; Núñez et al., 2015; Suárez-Orozco & Suárez-Orozco, 1995). Naturally, these stressors are exacerbated in immigrant families living in poverty, placing children at much greater risk for school failure and drop out (Portes & Rumbaut, 2014). At the same time, however, much research has documented the strengths of immigrant parents and families, including higher educational aspirations for children (relative to American-born parents), greater family cohesion (lower divorce rates), and fewer health and behavioral problems among children (Garcia Coll & Marks, 2011; Mistry et al., 2016). In this article, we examine how cultural beliefs about learning may be an additional source

of strength by supporting children's development of self-regulated learning (SRL) strategies.

Indeed, many children from East Asian backgrounds defy negative achievement predictions associated with poverty and immigrant status. At the country level, decades of comparative international achievement data show that East Asian students (e.g., Singaporean, Taiwanese, Hong Kong Chinese, Japanese, Korean) are among the highest achievers in mathematics, science, and reading (Fernández-Alonso, Suárez-Álvarez, & Muñiz, 2015). When East Asian children immigrate to the West, they continue to achieve at high levels. For example, systematic assessments of academic achievement conducted by the National Center for Education Statistics (NCES) consistently show that Asian American students (a group that includes immigrant children) are the highest achieving ethnic group in the United States across all academic domains, including mathematics, reading, science, history, economics, and civics (Duckworth, Gendler, & Gross, 2014; NCES, 2013; Zimmerman, 2013).

Most interestingly, it appears that, relative to other immigrant students, East Asian students may be less affected by socioeconomic status (SES). A

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This research was supported by the William T. Grant Foundation (award #1529). We wish to acknowledge the contributions of Susan D. Holloway, Jullian (Joe) Elliot, and Neil Hufton to the design of this research project. We thank the students for their generous participation.

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DOI: 10.1111/cdev.12702

recent analysis of the achievement of immigrant children from Turkey, Russia, ex-Yugoslavia, and China showed that Chinese immigrant children were the highest achievers, irrespective of where they came from in their home countries, what country they had immigrated to, what language they spoke at home, and their families' social class (OECD, 2012). These key factors may not impact Chinese immigrant students' achievement to the same degree, and thus we argue that the explanation for high achievement most likely lies in a culturally unique model of learning that influences the ways in which Chinese parents socialize their children for schooling and which in turn influences how children approach academic learning. Indeed, previous work on parental socialization documents that parents use their culturally shaped concepts, emotions, and behaviors to guide children in thinking and feeling about learning in ways that are valued in their respective cultures (Li, Fung, Bakeman, Rae, & Wei, 2014).

Recent research on cultural differences in learning beliefs suggests a conceptual distinction between Western and East Asian (Confucian) beliefs about learning. The "mind" model of learning describes Western beliefs, where the primary concern is to understand the world (Li, 2012). The mind model of learning values children's analytical thinking, inquiry, and exploration because these processes lead to discovery and insight. Thus, parents who espouse this model of learning believe that children are naturally interested and curious, and that motivation for learning comes from enjoyment, fun, and the pursuit of intrinsic interests (Deci & Ryan, 2000). Communication, especially verbal self-expression, is celebrated (Kackar, Shumow, Schmidt, & Grzetic, 2011), as is challenging established knowledge at home and at school by asking questions (Li, 2012).

In contrast, the "virtue" model of learning describes a Confucian orientation that emphasizes social and moral self-cultivation (Li, 2012). Accordingly, the learner seeks through learning to become *ren*, that is, the most sincere, genuine, and humane person he or she can become (Tu, 1985). Self-cultivation occurs at five relational levels, starting at home for children to learn how to relate to parents and other elders and siblings. The key of this home learning is for children to understand that they are the beneficiaries of their family's nurturance and they shall in return become benefactors to their family as they grow older (Rosemont, 1992). Then, this learning extends to others in the community and eventually to the larger world. Achieving harmonious relations between hierarchical superiors

(leaders/authorities) and subordinated parents and children, siblings, spouses, and friends are regarded as important learning tasks for all children. These levels of learning do not just aim at abstract knowledge but, more importantly, require one to practice the learned moral and social principles in daily life. Of central importance are developing and exercising a set of virtues in learning such as perseverance, concentration, humility, endurance of hardship, and respect for teachers and knowledge are required of children (Li, 2012).

It is likely, then, that the virtue model of learning influences how children behave—specifically how they *regulate* their learning—and that this self-regulation supports their academic achievement. Indeed, there is much research that demonstrates the strong and direct connection between SRL and academic achievement. Behavioral (sometimes referred to as cognitive-behavioral) self-regulation is one aspect of this multidimensional construct that describes the overt behavior of students who self-initiate strategies to organize and plan their time, generating optimal conditions to meet their learning needs (Zimmerman & Kitsantas, 2014; Zimmerman & Schunk, 2011).

What remains unconnected is whether children's culturally informed and internalized learning beliefs (i.e., the virtue model of learning) translate into SRL, and if so to what extent? Thus, we pursued the following research question: *Is the relation between Chinese American adolescents' virtue-oriented learning beliefs and their academic achievement mediated by their SRL behaviors?*

This research question is especially significant to low-income Chinese American adolescents for three reasons. First, according to existing theory, as discussed earlier, these adolescents' academic achievement exceeds expectations. It is thus important to explain alternative patterns and pathways that seem to counter existing theories. Second, research on Asian American achievement has been conducted predominantly on middle-class students and families. It is a well-established fact that families with more resources are better positioned to support their children's learning (Lareau, 2000; Putnam, 2015). What remains unclear is whether culturally informed and internalized learning beliefs also positively affect SRL of children from disadvantaged SES backgrounds. Here, we underscore three further perspectives: By studying these disadvantaged families and children, we are afforded an opportunity to identify the group's ethnic strengths that originate from the home culture's values of their parents. Relatedly, we document how these values may be transmitted to children for their education, as part of their

adaptation to the host culture and in the face of their struggles with low SES. Finally, understanding this developmental influence and process is particularly instructive for education policy and research on parental socialization. Beyond the two reasons for our chosen sample, we also argue that pursuing the research question we posed allows us to address the need for emic-based, qualitative research that explores culturally based influences on SRL (King & McInerney, 2014).

Undoubtedly, it is a mistake to assume that all Asian American students are uniformly high achieving. Due to their high achievement as a group, Asian Americans have been regarded as a model minority, a label that has negatively affected them for two reasons (Li & Wang, 2008). First, this characterization ignores the great variation in academic achievement between different subgroups of Asian American students (Qin, Way, & Mukherjee, 2008). Even more important, and less studied, is the fact that there exists considerable within-group variation in academic achievement among Asian American immigrant students (Ellis & Simmons, 2014; Pressman, Owens, Evans, & Nemon, 2014). Second, this model minority myth pits Asian Americans against other minority groups. However, large inequity exists across society (Reich, 2015). It is the system that needs to address such widespread challenges rather than directing attention to any minority group to blame.

Furthermore, social-capital theory, with its emphasis on differential access to social and cultural resources, and the immigrant paradox theory, with its focus on the negative impact of increased acculturation across generations, do not adequately explain within-group differences in academic achievement, largely because they are fundamentally social theories (Lareau, 2000; Sheldon & Epstein, 2005). As such, they often do not consider the cultural values and orientations that influence the ways in which parents convey critical messages about learning and education, even among disadvantaged groups. Considering the cultural role of parental socialization could afford us an opportunity toward greater understanding of how cultural learning models, children's learning beliefs, self-regulated behaviors, and academic outcomes may be linked, particularly among disadvantaged families in an immigrant context.

Thus, we developed four hypotheses to test the above conjectured framework. First, we anticipated that parental socialization about virtue beliefs (as perceived by students) would predict their children's internalization of the same beliefs (Hypothesis 1)

based on previous research. Second, we hypothesized that internalized virtue beliefs would predict students' actual SRL strategies and behaviors (Hypothesis 2). Third, we expected that their SRL strategies and behaviors would predict their achievement (Hypothesis 3). Fourth, we hypothesized that the relation between perceived parental socialization to achievement would be mediated by SRL behaviors (Hypothesis 4). This would suggest that parents' education socialization efforts have a positive effect on children's academic achievement by influencing their beliefs about learning and, in turn, children's SRL.

## Method

### *Participants*

In all, 32 self-identified, Chinese American ninth-grade, English-proficient adolescents (half girls) from Harrison High School (a pseudonym) participated in our study. Their enrollment at Harrison High School indicated that they met the town's criteria for English language proficiency, as the second high school in the city is designated for English as a second-language learners. Participants were recruited at the school by distributing our institutional review board-approved flyers. Adolescents who met our criteria received parental permission to participate and signed an assent form themselves. All but five were born in the United States, and all parents were born in Guangdong, China, Hong Kong (two families), and Fiji (one family). The five non-U.S.-born adolescents had immigrated with their families during elementary school. Harrison High is located in a mid-sized suburban city of 88,000 inhabitants near Boston. At the time of data collection (2004), the city's Chinese population was 10.8%, the highest in the state (statewide population: 1.41%). At Harrison High School, 30% of the student body was Asian American. Approximately 13% of the school population was eligible for free/reduced price lunch, as were all the participating teens. All but three adolescents spoke Chinese to their parents at home.

According to adolescents' reports, most parents' (88%) education was at the high school level or lower, five mothers had some college education, but several had no schooling at all. Parents' education was unrelated to our dependent variables. Most fathers and some mothers were employed in largely low-paying jobs, including cook, waiter, administrative assistant, and custodian. A few owned small restaurants, which required particularly long hours. All but one adolescent received free or reduced price lunch.

With one exception, all adolescents lived in two-parent homes. Most reported living with other related adults such as grandparents, aunts, and uncles (average of 1.65 per family), as well as with siblings and cousins. More than two thirds of the teens had extended families nearby. Teens reported rather frequent interaction (daily and/or on weekends), when extended family members came to dinner and helped with household chores. Cousins regularly visited during weekday evenings and weekends.

#### *Procedure*

We conducted individual interviews with each adolescent on two occasions, separated by about 3 months, using a standardized open-ended format. The interviews were sequential and designed to collect two different sets of data—one focused on home lives and the other on adolescents' perceptions of learning. Together, these interviews provided a fuller picture of their educational socialization (see below). Each interview was about 40–50 min in length. The interviews, which were tape-recorded and transcribed verbatim for later coding, were conducted by the second author, as well as her trained research assistant. We collected student grade point average (GPA) as an indicator of academic achievement.

#### *Achievement Data*

We collected GPA from school records. The average GPA for these students was 3.27 with a range 2.09–4.23 (GPA over 4.0 reflects weighted GPA, in which grades in advanced classes, such as Honors or Advanced Placement, are accorded more weight in the calculation of GPA). A total of 21 (66%) adolescents attained GPAs above 3.0 and 11 students (34%) below it.

#### *Interviews*

We designed the first interview to gather information on adolescents' home lives, daily routines, and school-related experiences, including the courses in which they were enrolled and their homework management. Based on prior research on parental educational socialization (Li, Holloway, Bempechat, & Loh, 2008), we included questions that probed adolescents' perceptions of their parents' expectations and standards for school performance and academic and career attainment, rewards and reprimands related to academic achievement and achievement-related behaviors (such as completing homework), and parental

monitoring of schoolwork. Given previous research on extended kin involvement in educational socialization (Li et al., 2008), we inquired about schoolwork monitoring and academic assistance from members of the adolescents' extended families. We designed the second interview to tap adolescents' perceptions of learning, including their coursework, teachers, peers, and learning beliefs. Throughout the interviews, we asked teens to clarify any meanings that were ambiguous and provide illustrative examples and we probed emergent issues.

We adopted an iterative approach to coding the interviews. Our primary goal was to maintain the meaning and integrity of adolescents' comments. The three authors each began by reading one interview at a time, highlighting all statements relevant to the central topics of this article: virtue-oriented learning beliefs, family (parent/kin) educational messaging, and academic self-regulation. We recorded distinct ideas related to each of these broad topics, considering an idea distinct if it was not interchangeable with another (Li, 2006). Throughout this process we shared memos and in the process of refining codes, defined the content and boundaries of each one (Luyckx et al., 2011), and developed a codebook of definitions, examples, and counterexamples.

#### *Family Educational Socialization*

We created one code each for comments that reflected virtue-oriented beliefs and SRL activities. We also created seven subcodes for statements reflecting family educational socialization based on prior research (Li, 2012). We present detailed descriptions of each code and their components in Table 1 along with their respective descriptive statistics in Table 2.

We coded for virtue-oriented beliefs when students spoke, for example, about how they invested effort and tried hard to learn, persisted to completion even when they did not enjoy a particular task, or believed that effort could increase knowledge and intelligence, all aspects of the virtue model supported by previous research (Li, 2012). The following example illustrates virtue-oriented beliefs:

Well, if I come across a question that I really don't know and I really try hard on it, and like, say it's geometry, cause yeah, it's really hard. If I come across a question and I did it and I checked it by the book and it's correct, then I'll be really happy. Because I really spent like time on it, and I'll be like proud of myself.

Table 1  
 Three Sets of Content Code With Components, Definitions, and Direct Quotes

| Code   | Definition   | Direct quote  |
|--|--|---|
| Virtue beliefs   | Endorsing importance of effort, hard work, diligence, endurance of hardship, perseverance, concentration, humility, respect for teachers, dedication, passion for learning | <i>[I really enjoyed] Um, science fair and um, the history project. Yeah, even though it took a long time, but after I did it, it came out really good, and I was like, oh so proud of myself . . . And then yeah, even though it was like really hard, and you didn't get much sleep, but then you look back and go, wow this is my project.</i> |
| Self-regulation  | Self-imposed study behavior  | <i>[What do you normally do on a Sunday?] Homework probably. And then, yeah, if sometimes, if my friends want me to go out then I will, but if I have homework then I'll do it because I don't want to do it at night.</i>  |
| Home educational socialization                                     |  |   |
| Expectations/advise/queries about school                           | Parents and kin communicate educational expectations, offer advice, inquire about school   | <i>My dad is kind of like, he doesn't really know about school . . . just cause he never went to school. So he's saying to me, he's like, you should do all your homework, I want you to go to the best college . . .</i>   |
| Compare child to hard workers/high achievers                       | Parents name learning models in kinship/community for child to emulate   | <i>Yeah, sometimes they [parents] will [talk to me about] my cousins, cause my cousins all go to work. They just use them as an example to talk to me . . . Some of them are engineers and computer programming, and some work in government.</i>   |
| Provide tangible/intangible resources                              | Parents provide resource for learning  | <i>Now I have to go to school on Saturday. I: To do what? To learn about web design. I think it's school at MIT. I: How did you get to know that? R: My father bring me there and he signed me up and go there.</i>   |
| Acknowledge child's effort   | Parents acknowledge child's effort   | <i>I: If you did really well, how would they [parents] feel? R: Complimenting me. Oh, good job. And yeah. They wouldn't give me money or anything</i>   |
| Understand parental sacrifices by child                            | Child expresses awareness of parental sacrifices   | <i>Cause he's [father] always saying, I don't want you to be like me. He works like really hard, like really hard stuff, so uh, yeah.</i>   |
| Express negative emotions about child's low effort/low achievement | Parents react strongly to child's failure of effort and achievement  | <i>If it was like one or two [missed homeworks], they wouldn't have a problem with it. If they knew like I didn't do all the homework all together then they would freak out and be like, oh why didn't you do it?</i>  |
| Negative consequences for low achievement                          | Parents punish child for poor achievement  | <i>I: What do you think they would do? R: No more computer maybe.</i>   |

We further coded for academic self-regulation when adolescents spoke about their self-initiated plans and strategies for completing homework and studying for tests.

Finally, we developed seven subcodes for family educational messaging, including (a) advice/queries about school, (b) comparisons to hard workers/high achievers, (c) tangible/intangible resources provided by parents, (d) acknowledgement of adolescents' hard work, (e) adolescents' expressed understanding of parental sacrifices, (f) parents' negative emotions in the face of low effort/low achievement, and (g) negative consequences for low achievement.

We recorded distinct ideas related to each code each time they were uttered by the participants. Following Li (2006), we considered an idea distinct

if it was not interchangeable with another. For example, if a participant expressed identical ideas in the same statement or in the same detail elsewhere in the interview, this idea was coded only once. The mean frequencies of each code were analyzed statistically for group differences. Interrater reliability between coders (the authors), assessed through the independent coding of 20% of the interviews, ranged from 82% to 93%. As a further check on the reliability of our coding, and to protect against bias in our coding, a new coder (a graduate assistant) who was blind to the study's questions and hypotheses independently coded 20% of the interviews. Interrater agreement between this blind coder and our coding ranged from 80% to 94%, Cohen's  $\kappa = .89$ .

Table 2  
Descriptive Statistics (M, SD, and Range) for Each Code and Components

| Code   | M (SD)       | Range |
|--|--------------|-------|
| Virtue beliefs   | 10.66 (.87)  | 2–22  |
| Self-regulation  | 10.28 (.84)  | 3–22  |
| Home educational socialization                                     | 24.75 (1.56) | 11–43 |
| Expectations/advice/queries about school                           | 14.53 (.97)  | 6–27  |
| Compare child to hard workers/high achievers                       | 1.28 (.25)   | 0–7   |
| Provide tangible/intangible resources                              | 1.38 (.23)   | 0–6   |
| Acknowledge child's effort   | 1.44 (.19)   | 0–4   |
| Understand parental sacrifices by child                            | 1.56 (.36)   | 0–9   |
| Express negative emotions about child's low effort/low achievement | 2.97 (.39)   | 0–11  |
| Negative consequences for low achievement                          | 1.59 (.44)   | 0–10  |

## Results

### Plan of Analysis

We began by creating variables for the frequency of each code that emerged from the interviews and used these variables in our subsequent quantitative analyses, a method that has been successfully used in a variety of studies (e.g., Cheah, Li, Zhou, Yamamoto, & Leung, 2015; J. Li, 2006; Shaver, Schwartz, Kirson, & O'Connor, 1987). The frequency of occurrence of each code in a given interview does not denote a sheer token count but rather reflects the complexity of each code and its full extension. For example, if an adolescent articulated 10 examples that reflected the importance of diligence, hard work, humility, and respect for teachers, we assumed that this teen has a more articulated virtue belief than a peer who expressed one example.

We then examined the relation between family educational socialization and adolescents' virtue-oriented learning beliefs and between adolescents' virtue-oriented learning beliefs and their academic achievement. Finally, we tested the hypothesis that the relationship between adolescents' academic achievement and virtue-oriented learning beliefs would be mediated by adolescents' academic self-regulation.

### Family Educational Socialization and Children's Virtue-Oriented Learning Beliefs

We regressed adolescents' expression of virtue-oriented learning beliefs on their family educational socialization scores, controlling for gender. Gender

was not a statistically significant predictor,  $b = 1.90$ ,  $t(31) = 1.42$ ,  $p > .05$ . However, family educational socialization scores significantly predicted adolescents' expression of virtue-oriented learning beliefs,  $b = 0.44$ ,  $t(31) = 3.24$ ,  $p < .01$ , 95% CI [.16, .71],  $B = .45$ . That is, on average, adolescents who reported more family socialization around education expressed more virtue-oriented learning beliefs (Table 3).

### Children's Virtue-Oriented Learning Beliefs and Academic Achievement

We regressed academic achievement (GPA) on their virtue-oriented learning beliefs, controlling for gender. Gender was not a statistically significant predictor,  $b = -0.08$ ,  $t(30) = -0.44$ ,  $p > .05$ . However, virtue-oriented learning beliefs significantly predicted adolescents' academic achievement,  $b = 0.05$ ,  $t(30) = 2.57$ ,  $p < .05$ , 95% CI [.01, .09],  $B = .44$ . That is, on average, adolescents who reported more virtue-oriented learning beliefs about education obtained higher grades (Table 4).

### Mediation Analysis

We hypothesized that the relation between adolescents' academic achievement (GPA) and virtue-oriented beliefs would be mediated by adolescents' SRL. To test this model, a series of regression models was calculated following the procedure outlined by Baron and Kenny (1986). The hypothesized mediator (SRL) was regressed on the independent variable (virtue-oriented learning beliefs). Virtue-oriented learning belief scores significantly predicted children's SRL,  $b = 0.60$ ,  $t(31) = 4.27$ ,

Table 3  
Relations Between Educational Socialization and Children's Virtue-Oriented Learning Beliefs

| Outcome                        | Virtue-oriented learning beliefs |          |
|--------------------------------|----------------------------------|----------|
|                                | $n = 32$                         | $n = 32$ |
| Intercept                      | 2.76                             | 1.93     |
| Gender                         |                                  | 1.56     |
| Home educational socialization | .32***                           | .32***   |
| $R^2$                          | .33                              | .36      |
| Model sum of squares           | 246.20                           | 265.61   |
| Residual sum of squares        | 501.02                           | 481.61   |
| Model $df$                     | 1                                | 2        |
| Residual $df$                  | 30                               | 29       |
| $F$                            | 14.74***                         | 8.00**   |

\*\* $p < .01$ . \*\*\* $p < .001$ .

Table 4  
Relations Between Children's Virtue-Oriented Learning Beliefs and Academic Achievement

| Outcome                 | Grade point average |               |
|-------------------------|---------------------|---------------|
|                         | <i>n</i> = 32       | <i>n</i> = 32 |
| Intercept               | 2.73***             | 2.76***       |
| Gender                  |                     | -.08          |
| Virtue-oriented beliefs | .05*                | .05*          |
| <i>R</i> <sup>2</sup>   | .18                 | .19           |
| Model sum of squares    | 1.89                | 1.95          |
| Residual sum of squares | 8.59                | 8.53          |
| Model <i>df</i>         | 1                   | 2             |
| Residual <i>df</i>      | 30                  | 29            |
| <i>F</i>                | 6.62*               | 3.32*         |

\**p* < .05. \*\*\**p* < .001.

*p* < .001, 95% CI [.31, .88], *R*<sup>2</sup> = .38. On average, adolescents who expressed more virtue-oriented learning beliefs also reported more SRL behaviors. Secondly, the dependent variable (GPA) was regressed on the independent variable (virtue-oriented learning beliefs). Adolescents who expressed more virtue-oriented learning beliefs had higher GPAs, *b* = 0.05, *t*(31) = 2.57, *p* < .05, 95% CI [.01, .09], *R*<sup>2</sup> = .18. Thirdly, children's GPA was regressed on both virtue-oriented learning beliefs and SRL. With both independent variables in the model, virtue-oriented learning beliefs were no longer a significant predictor, *p* = .79, whereas SRL behaviors were, *b* = 0.075, *t*(30) = 3.38, *p* < .01, 95% CI [.03, .12]. A Sobel test was conducted to analyze the indirect effect of family educational socialization

on GPA via SRL. The test statistic of 2.65 was significant, *p* = .008. Thus, adolescents who expressed more virtue-oriented learning belief obtained higher grades to the extent that they developed SRL skills and behaved so. These relations are summarized in Figure 1. Table 5 provides the relevant regression tables.

## Discussion

Our analyses yielded four conclusions: (a) perceptions of family educational socialization efforts had a significant influence on the development of adolescents' virtue-oriented learning beliefs (Hypothesis 1), (b) adolescents' virtue-oriented learning beliefs were linked to their actual SRL behaviors (Hypothesis 2), (c) their SRL behaviors had a direct and positive impact on their academic achievement (Hypothesis 3), and (d) the relation between these adolescents' virtue-oriented learning beliefs and their academic achievement was mediated by their SRL behaviors (Hypothesis 4). We discuss these findings in turn.

The fact that perceptions of family educational socialization efforts was a strong predictor of adolescents' virtue-oriented learning beliefs echoes previous research showing that children come to internalize their parents' learning beliefs (Harkness, Super, & van Tijen, 2000; Rogoff, 2003) and that parents' learning beliefs and attitudes guide their children's developing beliefs about learning and predict their school achievement (Grolnick & Slowiaczek, 1994; Jeynes, 2010). For example,

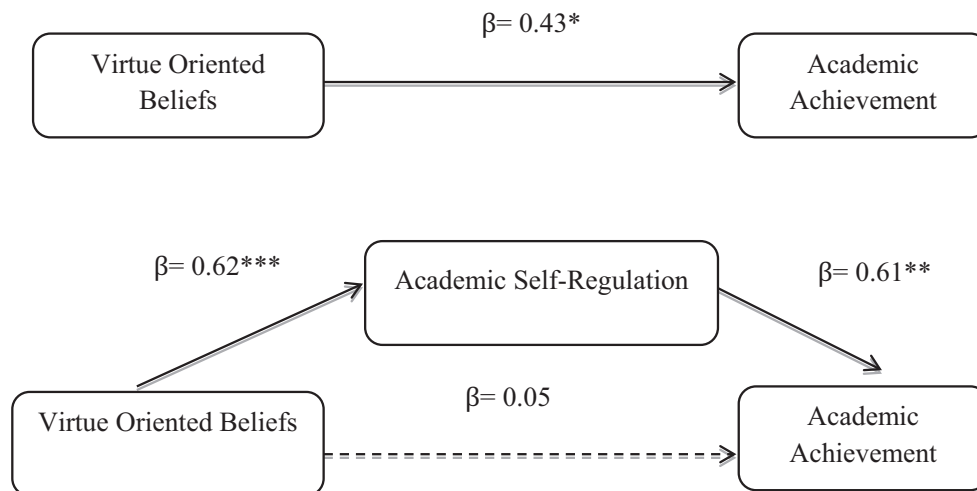


Figure 1. The indirect effect of children's virtue-oriented beliefs on academic achievement via academic self-regulation (\**p* < .05. \*\**p* < .01. \*\*\**p* < .001).  $\beta$  represent standardized coefficients.

Table 5  
*Regression Models Testing the Hypothesis That the Relation Between Children's Academic Achievement (Grade Point Average [GPA]) and Virtue-Oriented Beliefs Is Mediated by Children's Self-Regulated Learning*

| Outcome                  | GPA<br><i>n</i> = 32 | Academic<br>self-regulation<br><i>n</i> = 32 | GPA<br><i>n</i> = 32 |
|--------------------------|----------------------|--|----------------------|
| Intercept                | 2.73***              | 3.93***                                      | 2.43***              |
| Academic self-regulation |                      |  | .07**                |
| Virtue-oriented beliefs  | .05*                 | .60*   | .006                 |
| <i>R</i> <sup>2</sup>    | .18                  | .38  | .41                  |
| Model sum of squares     | 1.89                 | 265.13                                       | 4.32                 |
| Residual sum of squares  | 8.59                 | 435.34                                       | 6.16                 |
| Model <i>df</i>          | 1                    | 1  | 2                    |
| Residual <i>df</i>       | 30                   | 30   | 29                   |
| <i>F</i>                 | 6.62*                | 18.27***                                     | 10.18***             |

\**p* < .05. \*\**p* < .01. \*\*\**p* < .001.

parents' high academic expectations for their children are associated with children's positive self-perceptions of ability (Fredricks & Eccles, 2002). More recently, Jeynes' (2010) meta-analysis found that parents' educational expectations are more powerful in predicting children's achievement than parents' behavioral engagement with school (e.g., attending school meetings). Relatedly, McInerney (2008) proposed that parental provision of external tutors—a form of educational messaging—likely accounted for the fact that Asian Australian teenagers, who had little homework support from parents, attained significantly higher levels of success and held significantly more positive views about learning and education, relative to their Anglo, Aboriginal, and Lebanese Australian peers. Our results support these same conclusions. Adolescents in our study frequently reported that their parents did not engage with the school community, largely because of language, cultural barriers, and their need to work long hours to make ends meet, yet many adolescents excelled academically because they received frequent educational messages.

The strong and positive relation between adolescents' SRL behaviors and their academic achievement also confirms previous research on the importance of effortful planning, organization, and execution in school performance (Zimmerman & Schunk, 2011). Higher achievers described home routines that enhanced their school performance, which included active time management and persistence toward task completion. Tellingly, these teens did not need to be reminded by family

members to do their homework or study for tests; adolescents self-initiated and enacted plans to get their work done. In addition, they deliberately avoided behaviors that would have a negative impact on their well-being and achievement, such as leaving weekend homework undone until Sunday evening.

Our novel finding was that the relation between adolescents' virtue-oriented learning beliefs and their academic achievement was mediated by their SRL behaviors. This result provides a mechanism for the impact of cultural beliefs on children's academic achievement and suggests that the success of East Asian children may be attributable to their development of SRL behaviors. Indeed, a key source that contributes to the development of SRL is beliefs about learning and education communicated through families' educational messages (Gallimore & Tharp, 1990). Importantly, such family socialization is informed by the ethnotheories (Harkness et al., 2000) that parents hold dear. Because beliefs are an inherent property of culture, their source does not begin and end with parents but rather stems from their unique culturally based learning model. Thus, to the extent that families' educational messaging conveys their cultural values, in this case the virtue model, their children are likely to develop virtue-oriented learning beliefs, and these influence their self-regulated strategies and behaviors.

It is especially enlightening that the links from perceived parental educational messaging to adolescents own virtue beliefs to their SRL behaviors emanate not from advantaged SES families but from low-income Chinese immigrant families. This suggests that cultural beliefs about learning are a protective factor for low-SES East Asian adolescents insofar as they encourage adolescents' development of "virtuous" self-regulated behaviors. Thus, just as intervening on parents' beliefs about child development may influence their engagement in actions that support their children's language development (Rowe, 2008), so might intervening on parents' learning beliefs influence their engagement in behaviors that foster their children's beliefs about, and self-regulation of, learning. However, given the primacy of the virtue model of learning in this study, it will be very useful to explore culturally based learning models in other groups of immigrant parents and their adolescents. For example, our coding of adolescents SRL focused on the behavioral/cognitive behavioral dimension of SRL (Bembenutty, 2009). It may be that the motivational component of SRL is related to adolescents' mind



model of learning and, in turn, to their academic achievement.

Our research is limited by the fact that our data are correlational and were collected at a fixed point in time. We do not know how these teens' virtue beliefs evolved over time nor do we know how their SRL strategies and behaviors changed over their high school years. Thus, it would be important to conduct longitudinal research to document how virtue learning beliefs affect achievement over time and at what point in development parental educational socialization might be especially effective. For example, do parents' educational socialization practices at preschool age predict children's SRL behaviors in adolescence? We hypothesize that they will because parents appear to expect and demand that their children translate their virtue beliefs into SRL behaviors. Furthermore, previous research has found that children's learning beliefs develop early and strengthen with age: Research on the learning beliefs of Western and Chinese preschoolers demonstrated that as young as 4 years of age, children in these two cultures begin to articulate learning beliefs that reflect their cultural learning models (Li, 2004) and that, as they get older, their beliefs become more consistent and coherent with those of their cultures (Chen & Stevenson, 1995; Li, 2006). Future research might also explore whether there exist a virtuous cycle such that once SRL behaviors were developed and children were en route to higher achievement, parents were even more likely to support the development of virtue-oriented beliefs and behaviors.

As with all correlational analyses, an additional threat to our conclusion is the possibility of omitted variables bias in our estimates of the relations among our various predictors. However, this threat is somewhat mitigated given that our sample was relatively homogenous. The majority of adolescents came from families with mothers who did not obtain a college education (88%), and the majority of children were second-generation immigrants (83%).

An additional limitation is that our sample is specific to one city in the Northeastern United States. This makes it difficult to generalize our findings to the larger U.S. population of Chinese American adolescents. However, to our knowledge this study is the first to demonstrate a link between a particular cultural learning model, perceptions of parental educational socialization, SRL, and academic achievement.

In conclusion, we found that in a sample of low-income Chinese American adolescents, perceptions of family educational socialization beliefs and

practices predicted children's endorsement of their culture's virtue learning model and that adolescents' endorsement of these learning beliefs predicted their academic achievement in so far as their beliefs translated into their use of SRL strategies. We hope that these results will encourage further research in this area.

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### Supporting Information

Additional supporting information may be found in the online version of this article at the publisher's website:

**Table S1.** Percentage and Number (in Parentheses) of Adolescent Whose Mother, Father, or Family Had Achieved a Particular Level of Education

**Table S2.** Correlations Between Family Education and Our Outcome and Predictor Variables

**Table S3.** Relations Between Educational Socialization and Children's Virtue-Oriented Learning Beliefs

**Table S4.** Relations Between Children's Virtue-Oriented Learning Beliefs and Academic Achievement