

JESSICA F. HARDING, PAMELA A. MORRIS, AND DIANE HUGHES *New York University*

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# The Relationship Between Maternal Education and Children's Academic Outcomes: A Theoretical Framework

*The importance of maternal education for children's academic outcomes is widely recognized, and yet the multiple potential mechanisms that explain this relationship are underexplored. The authors integrate theories of human, cultural, and social capital with 2 developmental psychology theories—bioecological theory and developmental niche theory—to draw attention to how maternal education may influence children's academic outcomes through a range of parenting mechanisms, some of which have been largely neglected in research. This framework provides a more complete picture of how maternal education shapes proximal and distal influences on children's academic outcomes and the ways in which these mechanisms interact and reinforce one another across time and context. The implications of this framework for future family research are then discussed.*

Family socioeconomic status (SES)—generally measured by parents' education, income, or employment status or a combination thereof—is recognized across disciplines as contributing to

educational disparities (Coleman et al., 1966; Duncan & Murnane, 2011). Although they are highly interrelated, specific components of SES may influence child outcomes through particular mechanisms (Duncan & Magnuson, 2003, 2012). There are relatively rich literatures on the processes by which income and employment affect children, but there is a comparative lack of understanding of the complex processes by which parents' education influences children's outcomes to drive such disparities. Parental education may be a particularly important factor in contributing to children's academic outcomes, with research suggesting it has the strongest relationships with children's cognitive development (Reardon, 2011). In the United States, there is more than a 0.5-standard deviation difference in test scores between children whose parents have a college degree and children whose parents have a high school degree (Duncan et al., 2012). These differences have implications for children's longer term educational outcomes: High school graduates whose parents have at least a bachelor's degree are nearly twice as likely to enroll in college than high school graduates whose parents have less than a high school degree (Choy, 2001). Moreover, young adults whose parents have not attended college often enroll in less selective colleges than they are qualified for, and even when they do attend selective colleges, they graduate at lower rates (Bowen, Chingos, & McPherson,

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Department of Applied Psychology, New York University,  
246 Greene St., 619E, New York, NY 10003  
(jess.harding@nyu.edu).

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2009; Engle, 2007). Overall, research suggests that the intergenerational transmission of educational attainment is strong in many developed nations, including the United States (Duncan et al., 2012).

In this article we develop a theoretical framework to better understand the range of parenting practices by which maternal education influences children's academic outcomes. In light of the well-documented importance of parental education and the fact that mothers are still commonly the primary caregivers for children, scholars need to explicate the "black box" of the effects of maternal education. When mechanisms of maternal education are explored, typically only a single mediator (e.g., language use in the home) is examined. In addition, research has focused on mechanisms that occur within dyadic interactions between mothers and their children. In our view, a more complete understanding of the mechanisms through which maternal education influences children's academic outcomes requires a framework that explores how mothers operate at multiple levels of the bioecological environment to promote their children's educational development. For example, contextual factors, such as the educational attainment of mothers' social networks or the relationship between mothers and schools or neighborhoods, are potentially important mechanisms. In fact, the repetition of mechanisms across different settings likely contributes to making maternal education such a potent force in children's academic development.

We begin this article with a brief review of empirical evidence that suggests that maternal education has unique causal influences on children's academic outcomes. Next, we introduce developmental niche theory and discuss how integrating this with theories of human, cultural, and social capital and bioecological theory provides a useful and parsimonious lens through which to explore the effects of maternal education on children's academic outcomes. Each type of capital, its relationship to maternal education, and the distinct set of influences on children's academic outcomes related to this form of capital are then described in detail in order to show the multitude of ways that maternal education may have effects. We next describe other forms of capital that may enable many mechanisms to take place. Then we discuss different ways

that mechanisms may interrelate to improve children's outcomes. Finally, how this framework can be used to develop future family research is discussed. It is important to note that the goal is not to summarize these theories but to integrate and apply them to deepen understanding of the influence of maternal education on children's academic development.

#### THE IMPORTANCE OF MATERNAL EDUCATION FOR CHILDREN'S ACADEMIC OUTCOMES

Higher levels of maternal education are positively associated with many different academic outcomes for children throughout development. Prior to children's school entry, higher maternal education has been associated with more advanced spontaneous language production (Dollaghan et al., 1999) and standardized cognitive achievement tests (Magnuson, Sexton, Davis-Kean, & Huston, 2009). Throughout elementary, middle, and high school, meta-analytic findings demonstrate strong and consistent associations between maternal education and children's academic achievement, including students' grade-point averages and SAT scores (Sirin, 2005). Later in development, adolescents with mothers with higher levels of education are more likely to complete high school and enroll in college (Choi, Raley, Muller, & Riegle-Crumb, 2008). Although this research suggests there is a positive association between higher levels of maternal education and children's academic outcomes across childhood and adolescence, it does not necessarily imply that maternal education is the *cause* of children's outcomes. This is because maternal education is associated with a number of different characteristics—including income, family background, and genetics—that are also associated with child outcomes.

A number of methods have been used to address this issue of causality (see Holmlund, Lindahl, & Plug, 2011, for a review). Studies of the children of identical twin siblings who have different levels of education have attempted to separate genetic from environmental influences. Although these studies typically show larger effects for paternal than maternal education when they control for assortative mating (e.g., Haegeland, Kirkeboen, Raaum, & Salvanes, 2010), analyses of more recent cohorts, in which mothers have more access to education, found that mothers' schooling had a significant positive

causal effect on their children's schooling (Bingley, Christensen, & Jensen, 2009). Studies that explore the intergenerational transmission of education for adoptive versus biological children typically show positive associations between both parents' education and children's outcomes, although results are typically smaller for adopted children (Haegeland et al., 2010, but cf. Plug, 2004). In addition, research has found consistent causal effects of maternal education at the low end of the educational distribution. One set of research has isolated the effect of education by showing that increases in maternal education, once mothers already have children, are associated with improvements in children's cognitive scores (Harding, 2014; Magnuson, 2007; Magnuson et al., 2009). Stronger causal evidence is provided by an instrumental-variables analysis of an experimental study of approaches to welfare that found that mothers' completion of additional months of education had positive effects on the cognitive skills of their children (Gennetian, Magnuson, & Morris, 2008). In addition, studies of changes in compulsory schooling laws have found significant effects of mothers' education on children's educational attainment (Black, Devereux, & Salvanes, 2005; Chevalier, 2004) and reductions in children's grade repetition (Oreopoulos, Page, & Stevens, 2006). In sum, although there are some mixed results, overall the evidence suggests the importance of maternal education and demonstrates the need for work exploring the key mechanisms of the relationship between maternal education and children's academic outcomes (Holmlund et al., 2011).

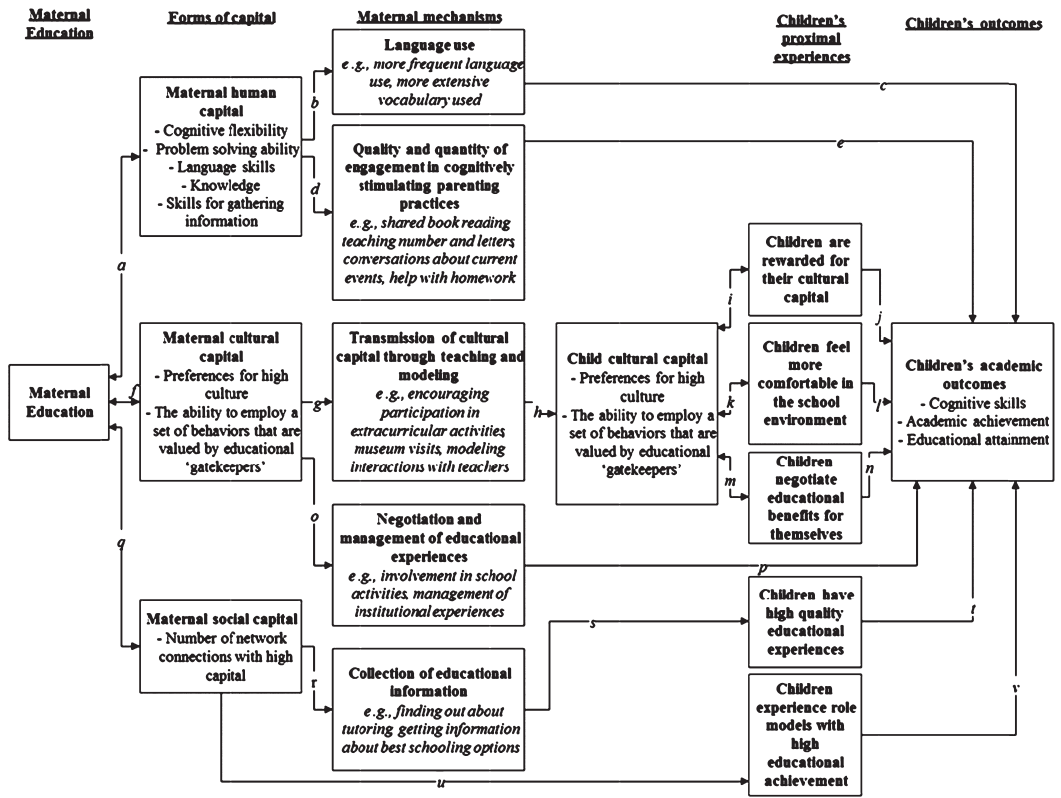
#### A FRAMEWORK FOR UNDERSTANDING THE INFLUENCE OF MATERNAL EDUCATION

The heuristic framework that guides our integration of theories of capital, bioecological theory, and developmental niche theory is shown in Figure 1. The initial construct of interest is maternal education. In this article we use the term *maternal education* broadly, to refer to a greater number of years spent in education. The outcome of interest is *children's academic functioning*, which is defined as including three interrelated, but separate outcomes: (a) cognitive skills, (b) academic achievement, and (c) educational attainment. *Cognitive skills* include abilities such as oral language and information-processing skills

that form the basis for learning (Duncan et al., 2007). Cognitive skills are also important for children at later ages, given that performance on standardized tests intended to measure cognitive ability are important for acceptance to college. *Academic achievement* refers to how well students do in school, as measured by their grades. Because grades are assigned by teachers they also capture a set of behavioral skills, such as how well students behave in school. The term *educational attainment* captures educational progress by measuring the highest level of schooling that an individual receives. All three outcomes measure children's academic outcomes, broadly defined, and are correlated with one another across development. We mention briefly where there are expected differences in the strength of the relationship of these outcomes with particular mediators in the model.

We propose that maternal education increases mothers' access to human, cultural, and social capital and that these forms of capital are then used by mothers in a variety of ways to promote their children's academic outcomes. Rather than focusing on the constellation of family conditions that are related to maternal education and have been studied more extensively, such as income (economic capital) and family structure (e.g., Brooks-Gunn & Duncan, 1997; McLanahan, 2004), we focus on understanding how maternal education shapes a set of proximal and distal parenting practices that are related to each form of capital. Parenting behaviors are the focus because such practices are unique pathways through which maternal education may influence children's academic outcomes, after accounting for the other components of SES. Moreover, parenting practices directly influence children on an everyday basis and are a well-established influence on children's academic development (Borkowski, Ramey, & Bristol-Power, 2001). As we shall describe, we explore parenting behaviors that are not limited to dyadic interactions between mothers and children but play out at different levels of the ecological environment, including the microsystem, the exosystem, and the mesosystem (Bronfenbrenner & Morris, 2006). To highlight the distinctiveness of the mechanisms associated with each form of capital, we discuss how these occur primarily at specific levels of the bioecological model, but we also note where

FIGURE 1. THEORETICAL MODEL OF MECHANISMS OF THE INFLUENCE OF MATERNAL EDUCATION ON CHILDREN'S ACADEMIC OUTCOMES.



these mechanisms occur at other levels. We discuss specific examples of mediators associated with each form of capital; however, this is not intended to be exhaustive. Instead, we hope these examples can direct attention to a wider range of mechanisms than has been explored to date.

Drawing on developmental niche theory highlights how children's academic development is enhanced by the systematic, repetitive, and diverse nature of the mechanisms used by mothers. Developmental niche theory maintains that environments "present a 'message' or create a continuing experience for the developing child far more potent than one would imagine from examining only a single element in this pattern" (Super & Harkness, 1999, p. 280). The concept that there are patterns and consistency in the messages and experiences to which children are exposed over time is termed *thematic elaboration* (e.g., mothers reading to their children

repeatedly from infancy through late childhood). The concept that different concurrent mechanisms from several parts of the environment reinforce one another to convey the same message during a single developmental period is termed *contemporary redundancy* (e.g., mothers, teachers, and librarians all reading aloud to children). Although the concept of the developmental niche is usually applied to understanding cultural differences in parenting, the key ideas are also useful in conceptualizing how the mechanisms associated with maternal education reinforce each other to influence children's academic outcomes (Pellegrini & Stanic, 1993).

The integration of developmental niche theory with theories of capital and the bioecological model draws together different disciplinary traditions to improve knowledge of the ways that maternal education benefits children's academic outcomes, with each theory emphasizing

attention to different aspects of this process. Theories of capital emerge out of economics and sociology and enable the articulation of how different forms of currency that exist within mothers themselves (human), within the congruency between mothers' attributes and those valued within the larger societal milieu (cultural), and within individuals to whom mothers have social ties (social) confer academic advantages to children. Bioecological theory is a central psychological theory and, in emphasizing the multiple nested structures in which children develop, is a critical tool for recognizing that the mechanisms linking maternal education and children's academic outcomes unfold at multiple levels and for drawing attention to a broader range of distinct but interrelated influences on children's academic outcomes. Finally, developmental niche theory emerges from psychological anthropology and adds to these approaches by illustrating how these diverse mechanisms reinforce each other. The integration of these theories draws attention to how maternal education shapes regularities across time and context to strongly influence children's development.

#### MATERNAL HUMAN CAPITAL

A human capital perspective argues that skills, knowledge, and capabilities that contribute to productivity are a form of capital that individuals can develop by investing in themselves (Schultz, 1961). As Coleman (1988) stated, "Human capital is created by changes in persons that bring about skills and capabilities that make them able to act in new ways" (p. S100). Nations may invest in the human capital of their citizens (World Economic Forum, 2013), but we focus on individual, rather than national, human capital. Completing education is the most formal means of developing skills and knowledge, so educational attainment is often equated with human capital. Although we draw on this research, educational attainment is better considered to be one factor, alongside health and on-the-job training, that contributes to the development of human capital and holds value in the labor market (Becker, 2002; Schultz, 1961).

Maternal human capital "provides the potential for a cognitive environment for the child that aids learning" (Coleman, 1988, p. S109) as mothers use their own cognitive skills in interactions to promote their children's development. Thus, in ecological terms, mechanisms that

involve human capital occur primarily in the microsystem of the bioecological model, defined as "a pattern of activities, social roles, and interpersonal relations experienced by the developing person in a given face-to-face setting" (Bronfenbrenner, 1994, p. 1645). Although human capital mechanisms most often occur within the home context in dyadic interactions between mothers and their children, these mechanisms also occur at other levels of the bioecological system such as when mothers use their human capital skills in interactions with other people.

#### *Maternal Education and Human Capital*

As depicted in the heuristic model illustrated in Figure 1, completion of additional education is a central way that individuals can develop their human capital (Path *a*). Through education, mothers develop a set of skills, including cognitive flexibility (e.g., learning to think about concepts simultaneously and in complex ways), problem-solving ability (e.g., hypothesis testing), language skills (e.g., vocabulary), and skills for gathering information and applying this information to novel situations (e.g., research skills; Mirowsky & Ross, 2003). Mothers with higher levels of education can then use these different skills to enhance their children's academic outcomes, for example, through (a) language use and (b) the quality and quantity of maternal engagement in cognitively stimulating parenting practices.

#### *Language Use*

Mothers with greater human capital have more advanced language skills and more extensive vocabularies, and they use these in daily interactions with their children (Path *b* in Figure 1). Hart and Risley's (1995) seminal study documented substantial discrepancies in the everyday language environments of children with parents with different SES: Children whose parents received public assistance (e.g., Aid to Families with Dependent Children) were exposed to less than one third of the words to which children from working-class and high-income families were exposed. These discrepancies also exist across groups defined by maternal education, with a review indicating that college-educated mothers talk more, ask more questions, and use fewer directives with their young children than do high-school-educated mothers

(Hoff, 2003). Although most research focuses on child–mother speech, mothers' language abilities are also utilized in interactions with people other than their child, and the more varied language used in these conversations may expose children to additional vocabulary (Hoff-Ginsberg, 1991). The notion of contemporary redundancy highlights that children of mothers with higher levels of education are exposed to higher level language in both direct and indirect interactions; this consistency of exposure to language is expected to strongly influence children's development.

Children exposed to more enriched language environments demonstrate more advanced language abilities, a crucial component of children's cognitive skills (Path *c* in Figure 1). For instance, the complexity of mothers' speech in naturalistic daily interactions has been significantly associated with children's early vocabulary development (Hoff, 2003) and complexity of speech at school entry (Huttenlocher, Vasilyeva, Cymerman, & Levine, 2002). Moreover, intervention research that trained low-income parents to use "elaborative reminiscing" (discussing past events with children) in daily conversations showed a significant positive effect on students' story comprehension (Reese, Leyva, Sparks, & Grolnick, 2010).

#### *Quantity and Quality of Engagement in Cognitively Stimulating Parenting Practices*

Mothers with greater human capital use more frequent and higher quality cognitively stimulating parenting practices, that is, practices intended to promote children's academic outcomes (Path *d* in Figure 1). Thematic elaboration draws attention to the ways in which these processes occur throughout development, meaning that children with more highly educated mothers experience a consistently stimulating environment. During infancy and preschool, mothers with more education read, tell stories, recite rhymes, sing songs, and do art with their children more frequently than their counterparts with less education (Raikes et al., 2006; Suizzo & Stapleton, 2007). Beyond these measures of particular behaviors, Magnuson and colleagues (Magnuson, 2007; Magnuson et al., 2009) have found that when young mothers returned to school there were significant increases in a composite measure of the quality

and quantity of stimulation and support available to a child in the home (Home Observation for Measurement of the Environment scores; Caldwell & Bradley, 2003). During middle childhood, highly educated mothers can use their own skills and knowledge (e.g., of world events) to contribute effectively to children's homework (Kohl, Lengua, & McMahon, 2000; Lareau, 1987).

Over and above more highly educated mothers' more frequent engagement in cognitively stimulating parenting practices, mothers may engage in higher quality interactions with their children because they are able to more appropriately tailor cognitively stimulating activities to their children's developmental level (Benasich & Brooks-Gunn, 1996; Kalil, Ryan, & Corey, 2012). For instance, as well as reading to their children more frequently, mothers with higher levels of human capital may choose a more developmentally appropriate book and ask more questions while reading it to their child. Torr (2004) described how college-educated mothers used book reading for more general exploration of external phenomena and human nature compared to their less educated counterparts. The greater quality and quantity of engagement in these activities illustrates contemporary redundancy. Moreover, the tailoring of these activities to children's development across time (Kalil et al., 2012) illustrates the concept of *thematic elaboration*, which suggests that the continuity and regularity in the use of these parenting practices over the course of children's development contributes to their effectiveness in enhancing children's academic outcomes.

A substantial amount of research demonstrates that cognitively stimulating parenting practices are a strong influence on children's academic outcomes (Path *e* in Figure 1). Children whose parents read to them and teach them numbers and letters more frequently have been shown to have higher literacy scores in early childhood (Senechal & LeFevre, 2002), and ratings on the Home Observation for Measurement of the Environment scale have been linked to numerous academic outcomes for children across development (Dubow & Ippolito, 1994). Finally, experimental evidence has illustrated that training parents to use richer book-reading techniques, such as asking more open-ended questions, significantly improves their children's

expressive language skills (Arnold, Lonigan, Whitehurst, & Epstein, 1994).

#### MATERNAL CULTURAL CAPITAL

In Bourdieu's (1986) articulation of cultural capital, schools and other societal institutions are not neutral; instead, they more closely reflect and privilege the experiences of the "dominant class" (see also Lamont & Lareau, 1988). More specifically, educational gatekeepers (e.g., teachers, administrators) recognize and value individuals who prefer high-culture activities (e.g., art and theater) and who exhibit particular linguistic structures and behavioral codes (Bourdieu, 1986; Lareau, 2011). Cultural capital encompasses a set of preferences and behaviors that, although not inherently better than others, are relevant for educational success because they are sanctioned in a particular society's educational settings (Lareau, 2011).

Cultural capital mechanisms are inherently transactional because the preferences and behaviors they encompass require recognition and validation by key gatekeeping individuals and institutions. The concept of cultural capital thus shifts our focus from mechanisms occurring primarily within the family microsystem to mechanisms that principally occur in the interaction between different microsystems, termed the *mesosystem* in the bioecological model. The interactions between schools and families are likely to be central foci for these cultural capital mechanisms, given that these are two of the primary microsystems children experience (Crosnoe, 2004), but cultural capital can also be used by families in interactions with neighborhood institutions, including cultural and formal activity groups. Cultural capital mechanisms are related to but distinct from the human capital mechanisms previously discussed. For instance, in addition to teaching language itself (a human capital mechanism), mothers teach children social conventions about how to use language in desired ways. When these conventions are congruent with those that are socially sanctioned, mothers' teaching and modeling of cultural capital can enhance children's capacity to navigate settings such as schools and community centers.

#### Maternal Education and Cultural Capital

Prior research has shown that relationships exist between cultural capital and social class, defined by education, occupation, and income collectively (Bourdieu, 1986; Lareau, 1987, 2011), and we contend that exposure to education, in particular, increases mothers' levels of cultural capital (Path *f* in Figure 1). Education increases the length and frequency of mothers' exposure to high-culture activities such as theater and art, reinforcing their knowledge about and preferences for such activities (Smith, 1995). In addition, mothers with more education have been exposed to the language codes and norms of educational settings over a longer period of time and gain greater familiarity with them (Crosnoe & Kalil, 2010). The children of mothers with greater cultural capital can then reap academic advantages, and in the following sections we discuss two examples of this: (a) through modeling and explicit teaching, mothers can transmit cultural capital to their children, and (b) mothers can use their own cultural capital to negotiate high-quality educational experiences for their children.

#### Transmission of Cultural Capital

Mothers with higher cultural capital can transmit this to their children through modeling and teaching cultural capital (Path *g* in Figure 1). In terms of transmitting preferences for high culture, higher parental education is associated with more frequent engagement of children in high-culture activities, such as museum visits and art classes (Lareau, 2011). Indeed, in a national sample of eighth-grade students, even when controlling for income and students' prior academic ability, 50% of students whose parents had less than a high school education versus 11% of students whose parents had graduated from college had never attended art, dance, music, or language classes and had not visited a museum outside of school (Wildhagen, 2009). The concept of thematic elaboration draws attention to the fact that the building of preferences for high culture is unlikely to occur through a single exposure in time; instead, visits to developmentally appropriate cultural institutions and enrollment in activities during different age periods is necessary. Moreover, contemporary redundancy exemplifies that cultural capital is built most effectively in a variety of settings, as evidenced by the extremely structured

nature of middle-class children's time (Lareau, 2011). With regard to transmitting valued behaviors, mothers with greater cultural capital have more understanding of school structures and are thus better equipped to model and teach socially valued ways of interacting with educational settings, such as speaking politely but assertively (Lareau, 2011). Mothers with higher cultural capital may explicitly teach their children to interact with teachers or administrators to get what they want. For example, a mother could instruct her child on how to approach a teacher to find out how to improve a bad grade. Again, thematic elaboration illustrates that for children to develop facility with the set of behaviors valued in educational settings, mothers' modeling and teaching of such behaviors must take place over different developmental periods, because the behaviors valued in early school settings are not the same as those valued in college.

A cultural capital perspective argues that through these parenting behaviors, children gain cultural capital (Path *h* in Figure 1) and that children with higher cultural capital have a number of proximal experiences in school (Paths *i*, *k*, and *m*) that ultimately positively influence their academic outcomes (Paths *j*, *l*, and *n*). The most well-researched explanation for how children's cultural capital influences their academic outcomes is that children are rewarded by educational gatekeepers who misinterpret children's knowledge of art and music as intelligence (Paths *i* and *j*). Indeed, participation in high-culture activities has been associated with teacher-reported academic outcomes for children and adolescents in a number of studies that have adjusted for other factors, including SES and ability (Dumais, 2006; Rosigno & Ainsworth-Darnell, 1999; Wildhagen, 2009). Moreover, cultural engagement is formally sanctioned as desired by educational institutions because participation in extracurricular activities is a factor in admission to selective universities (Stampnitzky, 2006). In addition to being rewarded for their cultural preferences, children may be rewarded for their ability to follow the implicit "rules of the game" of educational settings (Lamont & Lareau, 1988). Next, children with higher cultural capital probably feel more comfortable in school settings (Path *k*) because there is a closer fit between their home and school systems. Students may feel a natural fit or ease, receive more frequent validation, and

experience less strain in school, which could contribute to their decisions to attain higher education (Path *l*; Rosigno & Ainsworth-Darnell, 1999). Finally, children may use their cultural capital to negotiate educational benefits for themselves (Paths *m* and *n*). For example, they can use appropriate behaviors to approach an administrator to argue for why they should be allowed to enroll in a class that has prerequisites they have not completed. Contemporary redundancy draws attention to how similar processes occur in other settings, including after-school activities, where children with higher cultural capital may receive more opportunities, such as lead roles in plays or leadership positions on sports teams.

#### *Negotiation and Management of School Experiences*

Mothers also use their own cultural capital to directly negotiate benefits for their children (Path *o* in Figure 1) throughout children's education. Cultural capital facilitates the frequency and effectiveness of mothers' interactions with institutions. Because mothers with higher cultural capital experience a closer fit of their social norms and behaviors with schools, they may be more frequently involved in their children's schooling (e.g., talking with teachers, volunteering with school activities) and treated better by teachers when there (Lareau, 1987; Pomerantz, Moorman, & Litwack, 2007). Crosnoe and Kalil (2010) found that increases in immigrant mothers' education predicted increased school involvement, perhaps because exposure to the U.S. educational system increases mothers' confidence and ability to navigate the system for their children. As well as being involved more frequently with school, more highly educated mothers are more effective in gaining desired outcomes from institutions than other parents, providing "hidden advantages" for their children (Lareau & Cox, 2011; Lareau & Weininger, 2008). In elementary school, mothers know that being involved in school can give them greater access to teachers. In high school, mothers know what to do to get their children into honors programs. For example, Lareau and Cox (2011) described a middle-class mother whose son was accepted into an honors class after she suggested to the guidance counselor that he was capable of it and had the support to succeed. These examples illustrate thematic



elaboration because they show that mothers gain benefits for their children throughout the course of children's education. Moreover, although the focus here is on school settings, contemporary redundancy highlights how mothers can use their cultural capital to consistently structure different settings to provide their children opportunities.

Path *p* in Figure 1 illustrates our expectation that children will have more favorable cognitive and academic outcomes when their mothers are more highly involved at school and more skilled at managing their children's institutional experiences. Indeed, more frequent parent involvement in school activities and more successful management of institutions is related to better cognitive skills for children in early elementary school (Fan & Chen, 2001), higher academic achievement for adolescents (Hill & Tyson, 2009), and enhanced success in college (Lareau & Cox, 2011).

#### MATERNAL SOCIAL CAPITAL

Social relationships can act as a form of capital by providing access to rewards and benefits, including pertinent educational information or admission to educational institutions (Portes, 2000). There are numerous definitions of social capital that explain processes at the individual and societal levels (Portes, 2000; Putnam, 1995). We focus on individual social capital because we are interested in how variation in mothers' access to social capital influences their children. We draw primarily on Bourdieu's (1986) conception of social capital to explore how social capital differs according to individuals' network ties to others who have high levels of capital. As Portes (2000) described, "Bourdieu's definition makes clear that social capital is decomposable into two elements: first, the social relationship itself that allows individuals to claim access to resources possessed by their associates, and second, the amount and quality of those resources" (p. 3). In particular, we use a social network perspective to highlight the ways that mothers' network connections beyond the immediate family enable unique mechanisms of the relationship between maternal education and children's academic outcomes (Cochran & Brassard, 1979; Lin, 2000).

We acknowledge that this definition of maternal social capital neglects other important definitions of the concept, including Coleman's

(1988) conceptualization of family social capital, which captures "the bonds between parents and children useful in promoting child socialization, and as such includes the time and attention that parents spend in interactions with children and in monitoring their activities and promoting child well-being" (Parcel, Dufur, & Zito, 2010, p. 830). This definition of *family social capital* is set aside until the section titled OTHER RELEVANT FORMS OF CAPITAL because our focus is on maternal social capital—the social capital that is available to mothers—rather than social capital in the family, family social capital takes the child as the unit of analysis and explores social capital as it is available to children (e.g., how family structure can affect the time parents have to devote to children). More specifically, the focus in this framework is on how maternal education can increase maternal social capital in ways that are beneficial to children.

Social capital mechanisms are distinct from but linked with human and cultural capital mechanisms. Whereas a human capital perspective focuses on how mothers use their education in interactions with their children, social capital focuses on interactions that take place between mothers and people in their social networks or between people in mothers' social networks and children. The distinction between cultural and social capital mechanisms is subtle but critical: Social capital focuses on the existence of the social relationships themselves, whereas cultural capital focuses on mothers' abilities to use behaviors that aid in navigating these social and institutional relationships. More specifically, social capital encompasses, for example, knowing a school administrator or the organizer of neighborhood activities, and cultural capital includes knowing how to use these relationships to gain educational rewards. Thus, just as cultural capital theory shifts our gaze to mechanisms occurring mainly in the mesosystem of the bioecological model, certain social capital mechanisms require attention to processes occurring at the level of the exosystem; that is, links between settings that do not directly contain the developing person but that can still influence processes within the individual's immediate context. Even when children are not in direct contact with their mothers' networks, these networks can contribute to children's academic success through providing mothers with access to information that mothers

use to structure high-quality educational experiences. People in mothers' social networks may also influence children directly; as summarized eloquently by Stanton-Salazar (1997), "Children are seldom raised exclusively within the confines of their nuclear families; rather, they are raised embedded in social networks that extend out into various social worlds where a wide variety of socialization actors and spheres are found" (p. 7). In this way, mechanisms related to maternal social capital may also occur in children's microsystems.

#### MATERNAL EDUCATION AND SOCIAL CAPITAL

We propose that more highly educated mothers are more likely than their less well educated counterparts to be embedded in social networks that contain knowledge, skills, and resources that are relevant to children's academic success (Path *q* in Figure 1). As Stanton-Salazar and Dornbusch (1995) explained, a network perspective underscores how educational attainment relates to differences in the opportunity to enter into influential social relationships. To begin, attending college offers mothers the opportunity to connect with others who are achieving college degrees, an opportunity that is less available to those who do not attend college. This inequality in initial access to highly educated others is maintained by the fact that people in particular jobs have similar education levels, constraining the opportunity to create contacts across educational boundaries. Given the intergenerational transmission of educational attainment, mothers with lower education may also rely on extended kin networks who are in similar situations (Stack, 1974). This educational homophily has real consequences given that it "limits people's social worlds in a way that has powerful implications for the information they receive, the attitudes they form, and the interactions they experience" (McPherson, Smith-Lovin, & Cook, 2001, p. 415).

Although research has documented educational homophily (Marsden, 1988; McPherson et al., 2001), no research of which we are aware has directly examined associations between the educational attainment of mothers' social networks and their children's academic outcomes. Instead, we draw on related evidence to theorize two potential mechanisms through which maternal social capital may affect children's academic outcomes: (a) by providing mothers with access

to information regarding academic and (b) by providing role models with high education who socialize children toward academic success.

#### *Collection of Educational Information*

Network ties to others who have high levels of capital provide mothers with information and access to academic resources (Path *r* in Figure 1). Educational homophily means that mothers with higher levels of education have more "weak ties" with other individuals with high levels of education. Granovetter (1973) described weak ties as characterized by low emotional intensity and few reciprocal services, in comparison to strong ties, which are characterized by frequent contact and high levels of trust. Granovetter showed that people were more likely to find jobs through weak ties than strong ties because strong tie contacts had social networks similar to those of the job seeker, whereas weak tie contacts were more likely to find out about novel job opportunities. In the same way, weak tie connections with high levels of education may be important in providing mothers with information; for instance, a coworker could suggest an after-school activity that covers child care during work hours.

The information gained from mothers' social networks can help them create higher quality educational experiences (Path *s* in Figure 1) to positively influence their children's academic outcomes (Path *t*). For instance, through discussing school issues with other parents who have a lot of knowledge about the school mothers can gain information about who the best teachers are and advocate for their children to be placed with these teachers. Mothers' social networks can also provide information relevant to choosing high-quality schools from early childhood through college. The most common ways that parents report learning about schools are "word of mouth" and "talking to others" (Glenn, McLaughlin, & Salganik, 1993). Lareau (2014) reported that suburban parents primarily relied on their social networks to choose neighborhoods and, subsequently, schools. She described how, because of differences in the social networks of working- and middle-class parents, the schools in which their children ended up in were very different: "These networks matter in that they are a conduit for valuable information. . . . [T]hese networks shaped the creation of choice sets, which in turn shape the kinds

of schools that families and youth consider” (p. 199). Mothers’ social networks are also relevant later in children’s educational trajectories as individuals in mothers’ networks who have attended college themselves can provide information about their college experiences to assist adolescents in the college decision-making process. Thematic elaboration illuminates how maternal social capital can create a developmental niche for children in which they experience high-quality learning institutions across early child care, K–12 schools, after-school activities, and college.

### *Role Models With High Educational Achievement*

The educational homophily of mothers’ social networks means that children are exposed to multiple role models with high education, creating a normative social structure in which high educational attainment is expected (Path  $u$  in Figure 1). Here, mothers’ strong ties may be more important than their weak ties. Mothers with higher levels of education likely have many friends and family members with high levels of education to act as role models to their children. Contemporary redundancy highlights that through exposure to their mothers’ highly educated friends and family, these children are socialized to value education from multiple sources, and their educational expectations and subsequent attainment are shaped by being in a social context with norms of high attainment (Path  $v$ ). Indeed, Carbonaro (1998) showed the importance of such shared norms; intergenerational closure (parents knowing more of their children’s friends’ parents) is associated with children’s mathematics achievement and a lower likelihood of dropping out of school. In addition, high school students who are exposed to more students with college-educated parents have higher college enrollment, controlling for their own prior achievement and family background (Choi et al., 2008).

### OTHER RELEVANT FORMS OF CAPITAL

As we noted, our particular focus on maternal human, cultural, and social capital neglects other potentially important forms of capital. In this section we discuss how family social capital and maternal psychological capital may be necessary for mothers to be able to engage in many

of the mechanisms we have outlined. Coleman (1988) argued that mothers’ human capital is irrelevant if mothers are not an important part of their children’s lives. In order for maternal human capital to be advantageous to children, mothers must spend time with and invest in their children (Parcel et al., 2010). Moreover, children with closer bonds to their parents may internalize their parents’ socialization of values more completely (Parcel & Dufur, 2001). In these ways, family social capital can promote children’s academic success.

Psychological capital may also enable other mechanisms to occur. Individuals’ mental health, sense of control or self-efficacy, and skills in navigating stressful situations can be considered to make up their psychological capital. It is important to note that higher levels of education are associated with all of these skills (Augustine & Crosnoe, 2010; Mirowsky & Ross, 2003). Mothers’ psychological capital may be necessary for their ability to engage in many of the parenting mechanisms outlined above. Depression and lower self-efficacy can mean that mothers are less engaged and consistent in interactions with their children (Jones & Prinz, 2005; McLearn, Minkovitz, Strobino, Marks, & Hou, 2006). Moreover, mothers experiencing depression are less likely to interact with their social networks and have less satisfying interactions when they do (Nezlet, Imbrie, & Shean, 1994; Segrin, 2000), and lower self-efficacy is related to less willingness to engage with schools or neighborhood institutions (Shumow & Lomax, 2002); these factors can reduce the influence of social capital mechanisms on children’s development. In sum, family social capital and maternal psychological capital may enable and enhance many of the behaviors in which mothers engage.

### FUTURE DIRECTIONS FOR RESEARCH: RELATIONSHIPS BETWEEN MECHANISMS

The theoretical framework we developed in this article is intended to draw attention to the numerous processes through which maternal education affects children’s academic outcomes, but ultimately the mechanisms associated with each type of capital act in concert. Developmental niche theory argues that this consistency results in a stronger influence on children’s development than examination of only a single mechanism would suggest. This

requires an approach to studying mechanisms that emphasizes how different mechanisms connect and interact across time and context to promote children's development. In this section we discuss two ways that the mechanisms associated with different forms of capital may combine—through reinforcing one another (*repetitive effects*) and through interacting to boost children's development (*synergistic effects*)—and suggest possibilities for future research to explore these potential interrelationships. In addition, we suggest directions for future research into specific pathways in the model where current research is limited.

### *Repetitive Effects*

Developmental niche theory suggests that there is a repetitive patterning of mechanisms across types of capital, just as there is among the mechanisms associated with each type of capital, such that children's environments are consistently organized to produce developmental outcomes. Thematic elaboration is evident in the way that mediators related to different forms of capital build upon one another across time. For example, maternal language use (associated with mothers' human capital) influences their children's language skills in kindergarten and, because skills beget skills (Duncan et al., 2007), these early language skills can influence later educational achievement and attainment. In addition, other mechanisms, such as the normative expectations that one will attend college (associated with mothers' social capital), can build on these early advantages to further influence educational attainment. Contemporary redundancy is evident in the way that messages associated with different types of capital are conveyed within the same time period across different contexts. For instance, the environments of young children with highly educated mothers are often structured to include frequent book reading activities (associated with mothers' human capital), exposure to museums (associated with mothers' cultural capital), and high-quality early childhood education, which may be chosen through information gained via mothers' social capital.

### *Future Directions for Research Into Repetitive Effects*

The above examples of repetition are theoretical, but empirical research could be used to explore

the extent to which there is repetition across children's environments, for instance: To what extent are children's environments consistent in promoting academic outcomes? Do some mothers use mechanisms associated with particular forms of capital but not others? To answer these questions and capture the full range of behaviors in which mothers engage, different approaches to research may be needed. Each of the theories on which we drew for this article emerge out of different disciplines and rely on somewhat different methods that can be used in conjunction to gain a more complete understanding of relationships between maternal education and children's academic outcomes.

Developmental niche theory has relied primarily on ethnographic methods for exploring continuity and discontinuity in environments (Pellegrini & Stanic, 1993). Super and Harkness (1999) explained that ethnographic research in the developmental niche tradition focuses on identifying patterns of behaviors and understanding the organizational structure of the developmental environment. For instance, they described conducting research that found that rural Kenyan parents encourage their children's motor development through holding their infant to stimulate the stepping reflex, helping their infant sit upright, and giving their infant practice in walking. They argued that the combination of these behaviors results in these children walking earlier than European-American children. Analogously, methods that focus on one element will not illuminate the pattern of behaviors that are relevant to explaining how highly educated mothers promote their children's cognitive development. Indeed, Lareau's (2011) ethnographic research, which showed the multiple ways that cultural capital functions to provide children with academic benefits, is a prime example of the benefits of this type of research. Ethnographic and qualitative approaches can provide a key foundation for better aligned quantitative methods that are more typically used in psychology, sociology, and economics. In addition, developmental niche theory has used spot observations to quantitatively measure physical and social settings to determine who is present with the child and what activities are taking place, for example, to explore between-group variation in the use of siblings as caretakers (Super, 1981). Spot observations and diary techniques could be used to understand regularities in the

behaviors in which mothers engage throughout the day and determine whether there is a consistent pattern in the kinds of activities that take place.

### *Synergistic Effects*

Over and above their repetition, the mechanisms associated with different types of capital may also relate to one another synergistically such that their interaction is greater than the sum of their parts. For instance, mothers' cultural capital can enable mothers to interact with their connections in ways that most successfully use the social capital available in their networks. As Stanton-Salazar and Dornbusch (1995) noted, "The process of inclusion in mainstream institutions is aided when cultural and linguistic capital are converted into instrumental relations with institutional agents" (p. 120). Knowledge of the appropriate way to interact with individuals who have high levels of capital means that such connections are more useful for facilitating children's academic success. Another example of synergy is that mothers' cultural capital can manifest in more frequent visits to museums, and mothers' knowledge and understanding of concepts (associated with mothers' human capital) can increase children's learning in these informal contexts (Siegel, Esterly, Callanan, Wright, & Navarro, 2007). Synergy can also enhance mothers' choice of schools for their children. Mothers receive suggestions regarding high-quality schools from their social networks and then use their knowledge and information-gathering skills (associated with mothers' human capital) to research and decide on the best schooling option (Weininger, 2014).

### *Future Directions for Research Into Synergistic Effects*

More studies are needed to explore how synergistic interactions between types of capital can promote children's outcomes. In an example of this, Parcel and Dufur (2001) studied the interrelationships between family and school forms of capital and found evidence for synergistic effects such that mothers' mental ability boosted the effects of going to a school where teachers reported higher caring on math achievement. Nevertheless, they also found some cases in which the combined effects of family and

school capital were less than would be expected if the effects were additive (*threshold effects*). It is possible that there are similar threshold effects in the different types of mechanisms associated with maternal education such that the combination of mechanisms does not provide additional benefits to children. Researchers could test the relative importance of different mechanisms through including multiple mechanisms and their interactions in a single study. This research could address questions such as, when parents use network connections and do their own research, do they choose higher quality schools for their children? Does experiencing high involvement in cultural activities buffer against low frequency of reading in the household? Does being read to later in childhood provide additional benefits over being read to earlier in childhood?

### *Other Directions for Future Research*

In addition to conducting research to explore the connections and interactions between mechanisms, research into specific pathways in our model would strengthen this area of study. First, studies frequently use components of SES interchangeably or as composites, making it difficult to explore maternal education by itself. For instance, the Hollingshead index combines adults' occupational prestige and education (Duncan & Magnuson, 2003). Scholars should pay more attention to disaggregating SES to explore how the specific components affect child development (Duncan & Magnuson, 2003, 2012; Mirowsky & Ross, 2003). Because of complex relationships between socioeconomic factors, intervention research that provides supports to mothers to increase their education is potentially useful for identifying the influence of maternal education. Second, although relationships between maternal education and certain mechanisms are well established (e.g., involvement in schooling, language use), less evidence exists for the association between maternal education and some of the mechanisms discussed here. Specifically, the field would benefit from quantitative research regarding the extent to which mothers with different levels of education manage children's institutional experiences and the ways mothers collect educational information about school and neighborhood resources and opportunities via their social networks. Third, additional research regarding

the relationship of some particular mechanisms and children's academic outcomes is needed, in particular with regard to the proposed cultural and social capital mechanisms. Future studies could quantify the educational attainment of mothers' networks and link this with children's academic outcomes. Scholars could also address the extent to which children are aware of the educational norms of the social networks to which they are exposed and whether their perceptions of these norms are linked to their educational expectations. Other research could explore how children negotiate educational benefits for themselves and the ways in which this contributes to positive educational experiences. Finally, in this article we focused on the effects of maternal education because of the central socializing influence of mothers. The importance of paternal education has been recognized in the status-attainment literature, but future research and theory could explore the processes by which paternal education shapes children's outcomes in more detail.

#### CONCLUSION

Maternal education is a salient marker of advantage not only for mothers themselves but also for their children. Yet the unique parenting processes by which maternal education influences children's academic outcomes have not been fully explicated, with the vast majority of research focusing on microsystem interactions between mothers and their children. In the framework discussed in this article, we presented a multisystemic conceptualization of a range of pathways through which maternal education is expected to influence children's academic outcomes. We highlighted how the repetition and reinforcement of these mechanisms across different developmental settings and across time structure children's environments in consistent ways to promote their academic achievement. We hope that the framework we have outlined in this article sparks more research into how maternal education shapes a range of mechanisms that interact to promote children's academic outcomes.

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