

Cumulative Disadvantage Framework Understanding Family Disadvantage And Children's Primary School Achievement: A Scoping Review

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Abstract

Family disadvantages have increased over past two decades, raising concerns about associated risks for child development and school achievement. In this article, we describe cumulative disadvantage framework and literature to understand associations between family disadvantage and risks for children's school achievement. Reviewing literature, we find that although some disadvantaged children manifest academic challenges, many children growing up in the persistent family poverty, low-SES, mother-only-family, over-family size, and neighborhood disadvantage are at greater risks for their school achievement. We also describe home education practice and school attendance underlying the association of family disadvantage with risk for children's school achievement for research and improvement of disadvantaged children's school achievement.

Keywords: Family disadvantage, Children's educational development, Home education practice, School attendance

Introduction

Family disadvantage has different connotations, indicating as persistent 'deprivation', 'inequality', 'vulnerability', and 'risk' in family domains that are more likely to affect children and adolescents' academic well-being (Bertrand & Pan, 2013; Cox, 2000; Dubois, 2001; Figlio, Karbownik, Roth, & Wasserman, 2019; Schorr, 1988). Family disadvantage is broadly conceptualized as: 1) persistent family poverty, 2) mother-only family, 3) low socioeconomic status, 4) over-family size, and 5) crowding house and neighborhood disadvantage (Schorr, 1988).

Over the seven decades extant research reveals that children growing up in the family disadvantages, compared to family advantages (e.g., relatively non-poor, two biological parents family, higher SES, small family size, & living in secured house or neighborhood) have more detrimental effects on their healthy development, social adjustment, and educational achievement during early childhood through early young life (Figlio, et al., 2019; Uddin, 2015, 2021).

Although vast majority of past research have focused partially on the relations between family poverty (Duncan & Brooks-Gunn, 1998;

Dubow & Ippolito, 1994; Lipman & Offord, 1997; Secombe, 2000; Uddin, 2022), mother-only-family (Brown, 2004; Ginther & Pollak, 2004; Martin, 2012; Sandefur, Meier, & Campbell, 2006), socioeconomic disadvantage (Crosnoe & Cavanagh, 2010; Sanuels, Shinn & Buckner, 2010; Uddin, 2017a), over-family size (Blake, 1989; Knodel & Wongsith, 1991), housing and neighborhood disadvantage (Buckner, 2008; Haber & Toro, 2004; Sanuels, Shinn, & Buckner, 2010) and children's academic achievement throughout the schooling, there is no single study on the relations between family disadvantage and academic well-being over the school years. Drawing from cumulative disadvantage model, this paper reviews and integrates extant literature on the relations between family disadvantage indicators and children's academic well-being. Second aim of the review is to discuss implications for future research directions and social policy implications to improve children's academic development associated with changes in family disadvantages.

Cumulative Disadvantage Framework

Dannefer (2003) defines cumulative advantage/disadvantage as the systematic tendency for interindividual divergence in a given characteristic (e.g., education, status, money, wealth) with the passage of time. First of all, Derek Price (1965) and then Robert K. Merton (1968) and DiPrete & Eirich (2006) propose cumulative advantage/disadvantage theory in social sciences. The concept of cumulative advantage/disadvantage resonates with popular folk sayings: "Success breeds success", "the rich get richer, but the poor get poorer" (Entwisle, Alexander, & Olson, 2001; Huber, 1998). According to Merton (1968, 1988), it goes beyond them: It explicates how the tendencies often occur independent of inherent merits and qualities. Particularly, Merton (1988) described cumulative disadvantage as dealing with "the ways in which initial comparative advantage of

trained capacity, structural location, and available resources make for successive increments of advantage such that the gaps between the haves and the have-nots...widen (p. 606). Cole and Singer (1991) addressed how early small differences in social status between students have large cumulative effects on academic achievement over the career development path. They proposed a theory of limited difference to explain the systemic process by which small differences accumulate to produce widely disparate outcomes over time. The initial small differences develop into wide disparities as higher achievements receive higher rewards that grow in value, while lower achievements receive lower rewards and decline in value over time.

Reviewing vast scholarly literature on cumulative advantage/disadvantage, family sociologists assume that the initial differences in family advantaged or disadvantaged statuses produce differences in academic achievements across the educational life cycle that have positive or negative consequences in socioeconomic status (e.g., occupation, income, wealth, power, prestige) and health attainment in later life (Blau & Duncan, 1967). Researchers argue that compared to family advantages, early childhood poverty and mother-only-family with lower SES, over-family size and lower quality of housing block to meet children's needs and human capital development (Lucas, 1999). This basic family advantage/disadvantage hypothesis is replicated in several research works (Attewell, 2001; Blau et al., 1967; Bast & Reitsma, 1998; Kerchhoff, 1993; Kerchhoff & Glennie, 1999; Lucas, 1999). For example, Daneman (1991) found that the variances in children's reading scores were significantly associated with family advantage/disadvantage status, controlling for demographic background. Based on developmental model Bast et al. (1998) found increased variances in reading and math skills among children who were growing up in family cumulative advantage/disadvantage process over

their ages. Baumert, Nagy, & Lehmann (2012) in 136 mixed ability classes found differences in reading and math development associated with path-dependent processes of cumulative advantages from grade 4 to grade 6. Using growth curve and quasi-simplex modeling, they found a compensation effect for reading and a fan-spread effect for mathematics, partly attributable to status-dependent processes of cumulative advantage/disadvantage. Based on cumulative advantage/disadvantage hypothesis and empirical research we next review relation between family disadvantage and children's school achievement.

Family Disadvantage and Children's Primary School Achievement

Based on cumulative disadvantage framework researchers in the social sciences have widely examined family disadvantage: 1) family poverty, 2) mother-only family, (3) low SES, (4) over-family size, (5) crowding house or neighborhood linking to child well-being and academic achievement throughout the schooling. In the next sections, we will include relevant literature to examine family disadvantage characteristics affecting children's underachievement throughout the schooling.

Persistent Family Poverty

Family poverty has been defined in many ways, including "minimal food budget" for the family members, "Thrifty food plan", "income inequality", "economic disadvantage or vulnerability" "deprivation", "chronic poverty", "relative poverty" etc. According to Orshansky (1965), when a family spends approximately one third of their income on food is called family poverty. The thrifty food plan that forms the basis of food stamp benefits and is the least expensive food plan developed by the U. S. Department of Agriculture. It is far below the amount most middle class families spend on it. Families with yearly pretax cash incomes that are below this

established threshold are counted as "poor" (Family Economics & Nutrition Review, 1997). Based on income approach, families with income only one US dollar daily are counted as poor. Family poverty also has been defined as economic vulnerability, deprivation, parental unemployment, financial strains, low SES etc. Despite this, currently researchers to define family poverty have emphasized on duration of family poverty that is more likely to affect child development and academic achievement.

Early approaches of family poverty are conceptualized simply as the economic resources of the child family at single point in time. In so doing, researchers often have indicated annual family income or poverty status of the family at the time of the interviews (Wagmiller, Kuang, Aber, Lennon, & Alberti, 2006). More dynamic conceptions of childhood poverty (e.g., permanent & transitory income, cumulative & persistent poverty, and the number and length of poverty spells) also fail to include important aspects of childhood history of exposure to economic or material deprivation. Permanent income and persistent poverty measures, which typically include average income or poverty status over the years, mask both economic disadvantages during childhood or changes in family economic conditions. Cumulative or persistent poverty measures, which usually examine the proportions of childhood spending in poverty, and poverty spell measures, which typically examine the number and duration of poverty spells children experience during their childhood. This measure also distinguishes the characteristics, such as improving, deteriorating, and stabilizing family economic circumstances. These measures do not usually differentiate deprivation experienced in early childhood and consequently in late childhood. When change in economic circumstances is taken into account, poverty measures typically compare income levels or poverty status at two or more time

points, but it overlooks the timing and duration of such changes.

Duration and persistence of family poverty (short-term or long-term) over the years can impinge on children's physical growth, socio-emotional development, behavioral outcomes and educational achievement (Brooks-Gunn, Klebanov, & Liaw, 1995; Duncan et al., 1998; McLoyd, Ceballos, & Mangelsdorf, 1996; Uddin, 2022). Research conducted during the 1990s indicates that children living below the poverty level are more likely to suffer from lower educational attainment than children who are not poor. That is, the children who come from poor families have less preparation before school admission, enroll in school to delay, have less engagement in school, receive lower scores on tests and drop out of school early than do non-poor children (Secombe, 2000). Using cross-sectional data from low-income, rural American children ($N = 287$) aged 8-10 years, a preliminary mediating analysis by Evans & English (2002) suggests that multiple cumulative physical and psychosocial stressors partially elevate risks of socio-emotional difficulties, accompanying childhood poverty. Smith, Brooks-Gunn, & Klebanov (1997) found that children in families with income less than one half of the poverty line scored between 6 and 13 points lower on various standardized tests than did children in families with incomes between 1.5 and 2.0 times the poverty line. Duncan et al. (1998) reported that economic conditions in early childhood have the biggest impact on the levels of early academic achievement. Lipman et al. (1997) agreed that poverty appears to be most detrimental to academic performance when it occurs in children's early childhood. Dubow et al. (1994) found that persistent poverty predicted decreases in math and reading scores. Duncan et al. (1998) speculated that poverty in early childhood affects school achievement throughout the life course. They suggested that "poverty has a strong association with a low level of preschool ability,

which is associated with low test scores later in childhood, as well as grade failure, school disengagement, and dropping out of school, even when controls for family characteristics such as maternal schooling, household structure, and welfare receipt are included".

Family structural Disadvantage

Family structure conceptualized as biological-parent-family, step-father or stepmother family, cohabiting parent family, and single mother family has far-reaching consequences for children's development and educational achievement (Ono & Sanders, 2010; Wu, Schimmele, & Hou, 2015; Uddin, 2009, 2012). Drawing from cumulative disadvantage framework, family structural hypothesis posits that disruptive family structure or unstable family structure interrupts children's cognitive development, and learning activities inside and outside the family, regardless of family SES and care given to the children. Family disruption theory suggests that children growing up in disruptive families (e.g., single mother family, step-parents family) experience more transitions and instability in their life than children in first married biological parent families (Biblarz & Gottainer, 2000; Fomby & Cherlin, 2007). These transitions prevent children from engaging in comprehensive learning activities and deep concentration in reading. They also get less emotional and material support from either step-mother or step-father families than that in the stable family structural patterns (Raley, Frisco, & Wildsmith, 2005).

Previous research indicates that children's single or divorced mother or step-father or step-mother family, compared to biological parent family or joint or extended family, have lower class attendance and engagement in school and that they have lower GPA across the educational levels (Brown, 2004; Ginther et al., 2004; Martin, 2012; Sandefur et al., 2006). These studies and others (Manning &

Brown, 2006) argue that structural deficits, lower socioeconomic resources and parental poor involvement are the key disadvantages that children face in single mother or stepmother or stepfather families than that in biological parent or other forms of families. Artis (2007) found that compared to two biological parent families, single parent families or parental union instability affected academic participation and outcomes among kindergarten-age children, independent of economic status of the family, involvement in children's education, and maternal depression.

Socioeconomic Disadvantage

Parental socio-economic status (e.g., education, occupation, & income) is one of the factors that may influence children's educational achievement throughout the schooling. Previous research has shown that socioeconomic status of parents may have an independent effect on children's educational attainment (Crosnoe et al., 2010; McLoyd, 1998; Ready, 2010; Uddin, 2017b, 2017c). For example, children of higher socioeconomic status families admit early at primary school, attend at school regularly, and have better grades than the children who come from lower socioeconomic status families. Blau and Duncan (1967) developed and analyzed status attainment within a wide framework by using a basic mobility model. They thought that it would be easiest to analyze if they examined the process by which men move up and down the social ladder in their family of origin to adult positions in a hierarchy of occupations. Rather than depicting the father-son relationship in a cross-tabular form, the regression method made it possible to approximate the process by which the son's status was attained. Actually, Blau et al. developed a Trans-generational Model of Status Attainment (TMSA) that includes father's education, occupation and income. These antecedent variables of parents work for the potential mediating role of children's school motivation and educational attainment. Later they

modified their basic model in that they includes broader framework such as early intelligence, number of siblings, father's education and occupation that together influence children's educational attainment (Blau et al., 1967). It focused on the processes of individuals developing personal qualities, such as motivation or skills at a given task that lead to educational achievement and eventually to positions on the occupational ladder. Acknowledgments between education, family status, and young people's ability levels as well as their motivations and aspirations were all contributive to one's status attainment, especially educational attainment.

Social Psychological Approach (Wisconsin model) developed by Sewell, Haller and Ohlendorf (1970) is a comprehensive process framework that includes parents' socio-economic status, child's mental ability, peer influence and personal aspirations that help link stratification and mental ability inputs through a set of social psychological and behavioral mechanisms to children's academic or educational performance. These subjective variables add a social psychological side that Blau et al. lacked in their research. This model makes definite solutions of children's educational and occupational status attainment. Although overview of theoretical perspectives and models discussed above suggests that lower social origin and socio-economic status influences children's lower educational and occupational attainment, none of the theoretical models directly explain how family types or family structures and disadvantaged socioeconomic status of parents influence their children's basic skills in math and literacy in Bengali and English in primary school.

Over-Family Size

Household and family size has pervasive negative effects on maternal and child health, including educational attainment (Blake, 1989; Knodel et al., 1991; Uddin, 2008). Household size refers to the number of individual persons living in the

same family. Family size refers to the number of live births of a woman in her reproductive age cycle. In order to examine relationship between family size and children's educational attainment, sociologists and demographers have developed several hypotheses. Of the hypotheses, mechanism of resource dilution or resource dilution hypothesis is very popular. According to this hypothesis, family size exerts negative effects on children's educational attainment (Blake, 1989; Polit, 1982; Terhune, 1974). The primary mechanism of resource dilution effects suggests: As the numbers of children increase in a family, so familial resources available to an individual child decrease and thus the less auspicious the individual sibling's life chances for education (Blau et al., 1967; Duncan, 1967). Here, resources are broadly defined as parental, especially mother time, attention, and emotional, as well as material and financial investments for child development and educational attainment (Blake, 1989). These studies assume that parents with many children are less likely to invest financial, emotional and affective resources in their children, thus negatively affecting their educational and status attainment (e.g., occupation, income).

An alternative hypothesis developed by Shavit & Pierce (1991) suggests that family size has positive effects on educational attainment of children among Arab-Moslems in Israel. It is assumed that Arab-Moslems tend to have large families in which they draw socioemotional support from the extended kinship ties that have positive effects on child development and child educational attainment. Extending their arguments to the orthodox Jewish families in the country, Shabit et al. (1991) maintain that even for a nuclear family, size becomes less of an obstacle in the path of children's educational attainment if the family can draw on the support of extended family ties.

Housing Disadvantage

Lower or Substandard housing characterized by house located in slum, rented house, limited room and space by household size and low resources related to children's education may have pervasive effects on children's development, behavioral outcomes and educational attainment (Buckner, 2008; Haber et al., 2004; Sanuels et al., 2010). Theory and previous literature suggests that crowding, noise, and substandard housing impinge on children's socioemotional and cognitive development (Bradley & Caldwell, 1984; Parke, 1978), psychosocial stressors, health (Evans, Wells, Chan, & Saltzman, 2000) that in turn effects on their educational attainment. Evans (2001) found that crowding and noise house elevate more psychophysical stresses in poor children than in non-poor children.

Ingersoll, Scamman, & Eckerling (1989) found that students with lower housing qualities and higher residential mobility over the school year had lower level of reading and math achievements in grade 1 through 12. This difference persisted when controlling for student SES. Rubin et al. (1996) compared homeless and housed school-age children from the same classroom. They found that math, spelling and reading achievement scores were lower for the homeless children than housed school-age children. This disparity was partially explained by differences in school attendance. Agustin et al. (1999) found that homeless school children in New York City shelters had more academic problems in reading, math, spelling compared to control group (non-homeless children). Adam & Chase-Lansdale (2002) linked a greater number of residential moves and lower quality of housing over the preceding 5 years had lower grades among lower-income adolescent girls, after controlling for sociodemographic risk. Fantuzzo & Perlman (2007) found that housing qualities, especially, homelessness and lower qualities of housing predicted lower levels of literacy and science achievement among 11,835 students from second grade cohort in a large, urban school

district. The findings persisted when controlling for gender, ethnicity, out-of-home placement, child maltreatment, and any birth related risks (e.g., inadequate prenatal care, premature birth or low birth weight). Using longitudinal data from Minneapolis U. S. Cutuli et al. (2013) found that poor children with homeless, frequently relocated house and rented house have lower achievement gaps in math and reading than children with standard housing. They also found that growth in math and reading was slower among children with substandard housing compared to children standard housing.

Taken together, theory and previous literature suggests that crowding, noise, and substandard housing impinge on children's socioemotional and cognitive development (Bradley et al., 1984; Parke, 1978), psychosocial stressors, health (Evans et al., 2000) that in turn effects on their educational attainment. Evans (2001) found that crowding and noise house elevate more psychophysical stresses in poor children than in non-poor children. Ingersoll et al. (1989) found that students with lower housing qualities and higher residential mobility over the school year had lower level of reading and math achievements in grade 1 through 12. This difference persisted when controlling for student SES. Rubin et al. (1996) compared homeless and housed school-age children from the same classroom. They found that math, spelling and reading achievement scores were lower for the homeless children than housed school-age children. This disparity was partially explained by differences in school attendance. San Agustin et al. (1999) found that homeless school children in New York City shelters had more academic problems in reading, math, spelling compared to control group (non-homeless children). Adam et al. (2002) linked a greater number of residential moves and lower quality of housing over the preceding 5 years had lower grades among lower-income adolescent girls, after controlling for sociodemographic risk. Fantuzzo et al. (2007)

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Pathways by Which Family Disadvantage Links School Achievement

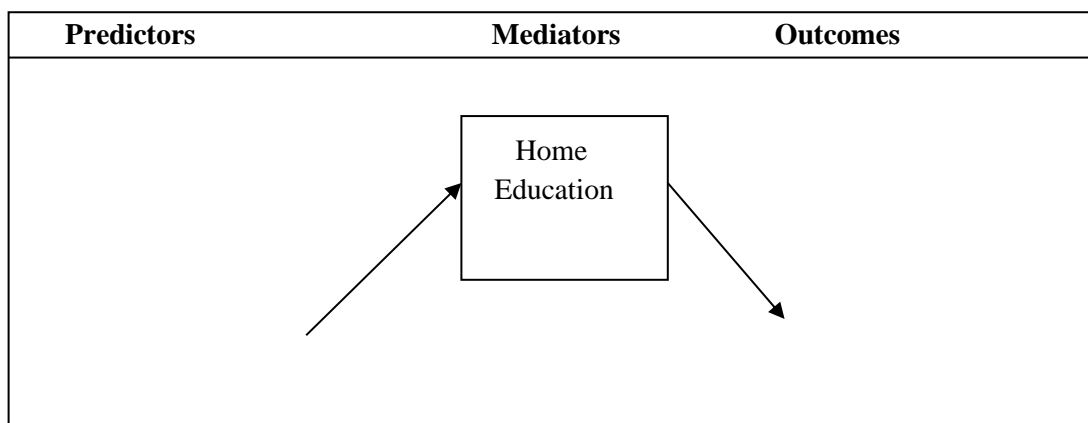
Children born and developed in family disadvantage situations (e.g., persistent family poverty, mother-only family, lower SES, over-family size, low quality of housing), compared to children living in family advantage situation (e.g., short-term family poverty, biological parent family, medium or higher SES, optimum-family size, better quality of housing) have poor early home care related to primary education and poor primary school attendance in basic courses (e.g., Bengali, English & Mathematics) from class one to class five that in turn may influence lower primary school achievement (e.g., lower average GPA in the basic courses) in slum children. The findings of National Center for Educational Statistics (NCES, 2006, 2007) show that the children (25%) living in poverty are more likely to have three or more days absences from classes per month. Romero & Lee (2008) found that children born to teenage mothers with consistent poverty are more likely to be chronically absent from early elementary school. Rafferty (1995) found that homeless with unstable housing

conditions are far more likely to attend classes regularly.

Home Education Practice and Academic Achievement

Using meta-analysis, 1987-2003, Cooper, Robinson, & Patall (2006) found that homework using as an exogenous factor has significant positive effect on school achievement in English language, vocabulary, science, and mathematics (see also Tonglet, 2000). For example, Foyle (1984, 1990) examined six high school classes in U. S. The experimenter assigned treatment and control groups and two intact classrooms were randomly assigned to practice homework, preparation homework, and no-homework conditions. Analyses of covariance that controlled pretest, aptitude and sex revealed that the students who did homework had higher posttest achievement scores than the students who did not. Using post hoc test, the experimenter found that there was a significant positive effect ($d = .46$) of unadjusted homework on the subsequent achievement scores. Foyle

(1990) also found similar findings in the same country. The researcher assigned four whole 5th-grade classrooms to conditions at random: One to a practice homework condition, one to a preparation homework condition, and two to a no-homework control condition. In so doing, researcher used students as a unit of analysis. Using covariance analysis the experimenter found that the students who did homework outperformed the no-homework students on unadjusted posttest scores, $d = .90$, and on posttest scores adjusted for pretest and intelligence differences, $d = .99$. Finstad (1987) examined the effect of homework on mathematics achievement for 39 second-grade students in two intact classrooms. One classroom was assigned to do homework and the other not. Using standardized test, data were analyzed on the student level. The findings revealed that the students doing homework in the classroom performed significantly better than the students no-homework in the classroom on a posttest measure, $d = .97$.



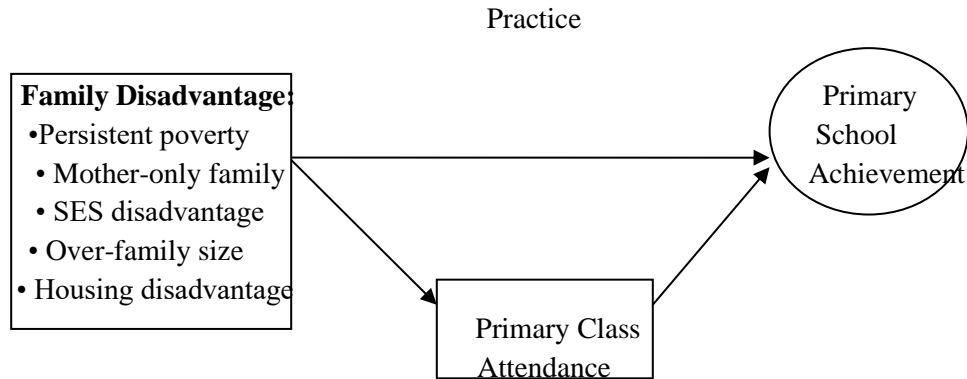


Figure 1: Conceptual framework on how family disadvantage through class attendance, and home educational practice influences primary school achievement

Based on Iowa Test of Basic Skills (ITBS) Meloy (1987) studied the effect of homework on English skills (e.g., sentence structure, writing) of third and fourth graders. Using randomized control trial, researcher found that homework interacting with condition-by-time had a significant negative effect on ITBS scores for third graders and a significant positive effect on fourth graders. McGrath (1992) also examined the effects of homework on the achievement of English scores among 94 high school seniors in the play Macbeth. In so doing, researcher divided the students in the ways in which half of the students received no homework and half received homework. In this study, the students were used as the unit of analysis. The experiment lasted 3 weeks and 12 home-works were assigned on the experimental group. The students with homework assignment had better scores on posttest English achievement measure ($d = .39$) than the students without homework. Townsend (1995) also examined the effect of homework on the acquisition of vocabulary knowledge among 40 third-graders in two classes. Treatment was given to the classes as a whole, but not assigned to the homework or no-homework condition. The students were used as a unit of analysis. The posttest measure of vocabulary knowledge prepared by teachers and its standardized test

revealed that homework group performed better than no-homework group, $d = .71$

Class Attendance and Academic Achievement

Every country in the world has a compulsory primary school attendance (CPSA) to develop children's cognition, social skills, and early academic achievement. Theories and research suggest that CPSA is more likely to enhance disadvantaged children's education than advantaged children (Ready, 2010). Although cross-sectional findings on the issue are huge, few longitudinal research studies have explicitly focused on how primary class attendance and educational care at home in Bengali, English, and Mathematics course is linked to primary school achievement in the basic courses that may promote students from primary school to high school level (Ready, 2010). Some cross-sectional studies indicate that school absence is significantly related to poor academic achievement (Lamdin, 1996; NCES, 2007). For example, using cross-sectional data, National Assessment of Educational Progress (NAEP, 2007) found that compared to regular class attendee (45%), 21% of the eighth graders who were absent three or more days from school per month achieved lower score at basic level. Using hierarchical linear modeling for early

longitudinal study data, Ready (2010) found that socioeconomically disadvantaged children who had regular class attendance rates achieved good literacy skills than their higher SES peers during kindergarten and first grade. Gormley, Phillips, & Dawson (2005) examined whether access in and attending to expanding universal kindergarten educational programs in Oklahoma, U. S. impact on 4 years children's academic achievement. Using regression-discontinuity method they found that the children who come from low income and single-mother families experienced substantial gains in language skills, applied problem-solving in math, and general knowledge than the higher income children. Weiland & Yoshikawa (2013) obtained similar findings, assessing the impacts of universal prekindergarten attendance on 4-year-old children's literacy and numeracy in Boston. They found that regular class attendees gained more on receptive vocabulary, early reading, working memory, and inhibitory control than those who did not attend preschool.

Conclusion and Implications

The above-mentioned review has shown that the associations between family disadvantage (e.g., persistent poverty, mother-only-family, SES disadvantage, over-family size and housing disadvantage) and poor primary school achievement are well-established. Although further review also suggested that poor home education practice and primary class attendance mediate the significant effects of family disadvantage on children's primary school underachievement, there is little empirical evidence on the pathways such as poor home education practice and primary class attendance to explain the associations between family disadvantage and primary school underachievement (Uddin, 2015). Using three or five-wave data future studies may explain the associations between family disadvantage and primary school underachievement, via poor home

education practice and primary class attendance. Causal data may have implications to improve children's primary school achievement with changes in family disadvantage and home education and class attendance at school.

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