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The Mediating Effects of Self-Esteem on the Relationship Between Child Poverty and Educational Achievement by Developmental Stages in South Korea

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Abstract This study investigated the relationship between child poverty and educational achievement in South Korea using secondary data collected over a 12-year period (from 2006 to 2018) by the Korean Welfare Panel Study. This study compared the impact of child poverty on educational achievement for primary school students with secondary school students after controlling for self-esteem and three covariates (gender, bullying, and child maltreatment). Three major results were found. First, child poverty was a significant predictor of lower educational achievement, including academic achievement and school adjustment. Second, self-esteem mediated the relationship between child poverty and educational achievement. Third, the direct effects of poverty and the mediating effect of self-esteem differed by developmental stages. Suggestions for intervention include mandatory employment of school social workers who can provide psychological support to children in elementary and middle schools and advocate for expanding the eligibility criteria for child allowance to all elementary and middle school students in South Korea.

Keywords Child poverty, Self-esteem, Academic performance, Adjustment to school, Mediating effect

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1. Introduction

Child poverty has been associated with many childhood problems including psychological health problems (Fitzsimons et al., 2017), delayed cognitive development (McCormick et al., 2019), poor academic performance (Clayton, 2011), and school dropout (Ambrose et al., 2017). A large body of literature indicates that poverty not only negatively impacts academic performances of children in nurseries (Ratcliffe & McKernan, 2012; García & Weiss, 2017), primary (Clayton, 2011) and secondary schools (Uleanya et al., 2020), but also affects adjustment to school (Ambrose et al., 2017), through parental participation (Gardea, 2020), child care (Lim et al., 2014), and self-competency (Ge & Ngai, 2020).

Previous studies on the relationship between poverty and school performance were mainly conducted in cross-sectional research (Clayton, 2011; Gardea, 2020; Ge & Ngai, 2020; Lim et al., 2014; Uleanya et al., 2020). Some studies examined the effects of poverty on school performance of children in kindergarten (García & Weiss, 2017) via a longitudinal research design. Ratcliffe and McKernan (2012) explored how adults who had grown up in poverty had escaped poverty using a panel study design. Some studies explored the negative effects of poverty on development of Korean children through a longitudinal study (Ku et al., 2009; Lee & Kim, 2012). However, little research has compared the negative effects of poverty on academic performance and adjustment to school for children in elementary schools and middle schools, respectively, using longitudinal data that evaluates children at different ages based on developmental theories.

Recent studies have examined the association between poverty and low level of self-esteem of adolescents (Jiang, 2020) and adults (Lee & Seon, 2019), and the relationship between self-esteem and academic performance (Luo et al., 2020; Onivehu, 2022). A few studies have paid attention to the mediating effects of self-esteem of students in low-income families on school performance through a resilient perspective (Ge & Ngai, 2020) and level of life satisfaction via an ecological perspective (Liu & Fu, 2022) in cross sectional studies. However, there is a limited body of research which examines how poverty, academic performance, adjustment to school, and self-esteem interact dynamically with two different developmental stages: children and early adolescents based on theoretical frameworks.

2. Theoretical Framework: The SEED Model

This study employed the *SEED* [Self-esteem, Economic status, educational achievement, Developmental status] model as a theoretical framework to examine dynamic impacts of child poverty on self-esteem and educational achievement by child developmental status through a deductive approach. The SEED model was created for this study, incorporating four existing theories: the Household Production Function [HPF] model (Becker, 1965), social causation theory (Dohrenwend & Dohrenwend 1969), resilience frameworks (Rutter, 1987; Gilligan 2000), and the developmental perspectives (Erikson, 1950; Kegan, 1982, Marcia, 1980; Piaget, 1963).

The HPF model provides the context to understand the relationship between child poverty and school achievement. According to the HPF approach, each household is influenced by household income, when they decide to allocate their limited resources for producing basic commodities such as protection against hunger as well as new commodities such as leisure and welfare (Becker, 1965). This approach posits that households are productive entities where caregivers (parents or single parent) make decisions about spending income on children. This model assumes that the rise of household income will generally increase the investments in children's education (Taubman, 1989). Duncan et al. (2011) examined the effect of increasing household income through 10 local welfare programs on academic performance of American young children (aged 2 to 5), and they found that household income had a positive relationship with academic performance.

Social causation theorists argue that socioeconomic status (SES) determines mental health conditions (Dohrenwend & Dohrenwend 1969). Social causation theory provides a framework for understanding how poverty can directly impact children's self-esteem. A study examining how self-perceived familial socioeconomic status (SES) influences self-rated health and self-esteem of adolescents found that subjective perceptions of SES were positively associated with self-esteem and self-rated health (Goodman et al., 2007). Lee and Seon (2019) found that the effects of maternal poverty were transmitted intergenerationally to children. Furthermore, utilizing social causation theory in a study with 1314 Chinese children in grade 4-9, Li et al. (2018) found that childhood poverty was correlated with low levels of self-esteem.

The resilience framework provides a conceptual lens to understand how children in poverty can enhance educational achievement with higher levels of self-esteem. Increasing self-esteem is one of the protective processes that play a role in reducing the psychological risks and negative chain reactions of adversity (Rutter, 1987). Gilligan (2000) further

developed the concept of protective mechanism established by Rutter (1987), which promotes resilience through establishing self-esteem, to understand how children at risk can react resiliently to adverse situations through developing self-esteem especially in schools. Luo et al. (2020) suggest a positive relationship between child self-esteem and school performance without considering poverty. Based on a resilient framework, a study conducted by Ge and Ngai (2020) shows a positive relationship between self-competency and educational performance.

The developmental perspective is concerned with how a child's development differs according to aged-related stages. Developmental theorists have distinguished children (aged 7 to 11) from adolescents aged over 11 or 12 to explain different psychosocial (Erikson, 1950; Piaget, 1963) or moral (Kohlberg, 1984) development between these two stages. Primary schoolers aged 7 to 11 start to use concrete ideas logically and understand reality by considering social rules and public opinion (Kohlberg, 1984; Piaget, 1963). Secondary schoolers aged 11 and above begin to think abstractly based on theoretical reasoning (Piaget, 1963). If adolescents fail to develop a positive identity through interactions with peer groups and personal reflection, they experience role confusion. (Erikson, 1950). Some developmental theorists distinguished early adolescence from late adolescence (Kegan, 1982; Marcia, 1980). Marcia (1980) explains Erikson's category of role confusion with three different styles: Identity diffusion, foreclosure, and moratorium. Early adolescents might make a commitment to roles and values under the influence of parents (foreclosure) or fail to make a commitment to roles and values (identity diffusion), but most will explore roles and values with some difficulties (moratorium) and achieve identity in late adolescence. Kegan (1982) also distinguishes early adolescence at the stage of affiliation versus abandonment from late adolescence at Erikson's developmental stage: identity versus role confusion. To early adolescents, whether they would be accepted or rejected by a group is a main concern to develop positive identity (Kegan, 1982). Thus, the differences in psychosocial development between the groups might differentially influence the associations between poverty, self-esteem, and educational performance (Crampton & Hall, 2017; Rosenberg & Pearlin, 1978).

Little research has explored how the mediating effects of self-esteem on educational performance on poor children at the differential developmental stages: children and early adolescents based on the developmental frameworks (Erikson, 1950; Kegan, 1982; Marcia, 1980; Piaget, 1963). Most studies examining the relationship between poverty, self-esteem, psychological well-being, and/or academic performance have only included a population at one stage of development: adults (Jin et al., 2020; Lee & Seon, 2019; Mikulášková & Adamkovič, 2018), college students (Liu & Fu, 2022; Wang et al. 2016), adolescents (Jiang, 2020; Li et al., 2017; Luo et al., 2020) or children (Ge & Ngai, 2020).

Based on the SEED model and previous research, this study examined the relationship between child poverty and educational achievement among Korean students in elementary and middle schools at different developmental stages using a longitudinal approach. This study also investigated the role of children's self-esteem in mediating the relationship between child poverty and educational achievement. Specifically, this study developed two hypotheses, as the following:

> Hypothesis 1: The effect of poverty on academic performance and adjustment to school will differ according to students' life stages (children vs. early adolescents), controlling for self-esteem, bullying, child maltreatment and gender.
>
> Hypothesis 2: The mediating effect of self-esteem on academic performance and adjustment to school will differ according to students' life stages (children vs. early adolescents).

3. Methods

3.1. Data and Research Design

This study employed secondary data that was collected by the Korean Welfare Panel Study [KWPS]. The KWPS selected the samples from the population and housing census that Statistics Korea collected through a probability sampling method (KWPS, 2023b). First, the KWPS distinguished the population according to household income, and then, the KWPS selected 3,500 low-income families and 3,500 middle- and upper-income families through disproportionate stratified sampling.

This study used the four sub-datasets that included only households with students in grades 4-6 in 2006 and 2015 and grades 7-9 in 2009 and 2018 from a total of 7,000 households (KWPS, 2023a). The 2006 and 2009 datasets include the same sample: elementary school students in 2006 and middle school students in 2009. The 2015 and 2018 datasets also include the same sample: elementary school students in 2015 and middle school students in 2018.

The study conducted a panel analysis to examine how poverty affects school performance and self-esteem at different life stages (primary schoolers vs. secondary schoolers). This study also reviewed a panel model to explore the mediating effects of self-esteem on the relationship between poverty and school achievement on elementary and middle school students.

3.2. Variables and Measurement

Child poverty was measured as a state of a child living in a family earning below 60% of median household income before public transfers in South Korea, which is most widely used in developed countries (KWPS, 2023c; Spicker, 2012). The KWPS collected annual household income by asking the parents of children "How much did your household earn for one year?" at the ratio level variable (KWPS, 2023b).

Self-esteem was measured with modified Rosenberg (1965)'s self-esteem scales. Rosenberg self-esteem scales, which were developed by Rosenberg (1965), is one of the standardized instruments, which represents adequate internal consistency (Cronbach alpha =.81), test-retest reliability (correlation coefficient =.85), and construct validity (Park & Park, 2019; Schmitt et al., 2005; Webster et al., 2017). Based on 10 items in Rosenberg self-esteem scales, the KWPS developed a new instrument to evaluate self-esteem of Korean students consisting of 13 items, in which 10 items came from Rosenberg self-esteem scales. The scores in each item range from one to four (1=never, 2=rarely, 3=often, 4=always), which has the total scores ranging from 13 to 52. Higher scores indicate high level of self-esteem. The Cronbach's alpha for internal consistency of the revised Rosenberg self-esteem instrument was 0.81.

Outcome measures were educational achievement related to academic performance and adjustment to school (Farmer et al., 2006). *Academic Performance* was measured as the average students' grades of the four categories: all subjects, Korean, mathematics, and English. The scale ranges from 1 to 5, which higher numbers mean better academic performance (1= needs to be improved, 2=do not meet the standard, 3= meet the standard, 4= good, 5= excellent). A meta-analysis conducted by Kuncel et al. (2005) shows that there is adequate reliability of self-reported academic achievement (ranging from r= .82 to r=.9) to measure actual grades.

Adjustment to school was measured as a Likert-type scale consisting of nine items that the KWPS developed. Each item measures how well students adjust themselves to school life by asking about their relationship with teachers, their attitudes toward class and students, and their perceptions on schools, teachers, and class. The scores in each item range from one to four (1=never, 2=rarely, 3=often, 4=always). Adjustment to school was measured through this instrument, which has the total scores ranging from 9 to 36. Higher scores indicate better adjustment to school. The Cronbach's alpha was 0.66.

In this study, covariates include gender (dichotomous variables: male vs. female), child maltreatment (dichotomous variables: no experience vs. experience), and bullying (dichotomous variables: no experience vs. experience). The KWPS developed Likert-type scales to measure bullying, consisting of six items, and to measure child maltreatment, including eight items, respectively. The six items measured how often students have experienced social, verbal, or physical bullying by their peers or not in the range from one to four (1=never, 2=once, 3=twice or three times, 4=more than three times). The eight items measured how often students have experienced abuse or neglect by their parent or a guardian acting as a parent with a range from one to five (1=never, 2=once or twice a year, 3=once or twice every other two or three months, 4=once or twice every month, 5=once or twice a week).

3.3. Statistical Analysis

To perform statistical analysis, SPSS 28.0 was used. Descriptive univariate statistics were performed with means and standard deviations for academic performance, adjustment to school, self-esteem and other continuous variables, and frequencies with percentages for child poverty and other categorical variables. Multiple linear regression analysis was used to examine the effects of poverty on self-esteem and educational performance in elementary and middle school students, after controlling for covariates. Following the approach of Baron and Kenny (1986), hierarchical linear regression analysis includes three steps which were employed to examine the mediating effects of self-esteem on the relationship between poverty and educational achievement, controlling for the covariates (bullying, child maltreatment, and gender). In the first step, the effect of poverty on self-esteem was tested. In the second step, the effect of self-esteem on educational achievement was tested. In the third step, the effect of poverty on educational achievement was tested.

$$\text{Step 1. } y_{(selfesteem)i} = \beta_i + \beta_a(poverty)_i + \sum_{n=1}^{3}(Cov_n) + \varepsilon_i$$

$$\text{Step 2. } y_i = \beta_i + \beta_b(selfesteem)_i + \sum_{n=1}^{3}(Cov_n) + \varepsilon_i$$

$$\text{Step 3. } y_i = \beta_i + \beta(poverty)_i + \sum_{n=1}^{3}(Cov_n) + \varepsilon_i$$

Based on the hierarchical linear regression analysis, the following Sobel test, which was developed by Sobel (1982) was conducted to confirm the mediating effect of self-esteem on the relationship between poverty and dependent variables. Z-value for Sobel test was calculated by following formula and *se* refers to standard errors obtained by above regression models (Sobel, 1982). The level of statistical significance was set as a p-value less than 0.05 for all inferential statistics.

$$Sobel\ Test_{(z-value)} = \frac{\beta_a \times \beta_b}{\sqrt[2]{\beta_a^2 \times se_{\beta_b^2} + \beta_b^2 \times se_{\beta_a^2}}}$$

4. Results

4.1. Sample Characteristics

The total sample size was 2,205 that include 1,217 elementary students and 988 middle school students. Table 1 represents the demographic information and the average scores of self-esteems, academic performance, and adjustment to school for the two sub-samples: elementary students and middle school students. The ratio of gender of all samples was 51% (n=1,116) for male and 49 % (1,089) for female. The gender ratio among the middle school sample was approximately 1:1, which was 495 males (50.1%) and 493 females (49.9%). Middle school students (31.2%) reported experiencing neglect or abuse slightly more frequently than elementary students (29.8%). On the other hand, children in elementary schools (46.1%) were more likely to experience bullying than children in middle schools (28.0%).

Table 1. Descriptive Statistics of the Total Sample

	Freq. (%) or Mean (SD)		
Variables	Elementary School Sample (n=1,217)	Middle School Sample (n=988)	Total (n=2,205)
Gender			
Male	621 (51.0%)	495 (50.1%)	1,116 (50.6%)
Female	596 (49.0%)	493 (49.9%)	1,089 (49.4%)
Child Maltreatment			
No experience	836 (70.2%)	658 (67.0%)	1,494 (68.8%)
Any experience	355 (29.8%)	324 (33.0%)	679 (31.2%)
Bullying			
No experience	649 (53.9%)	711 (72.0%)	1,360 (62.0%)
Any experience	556 (46.1%)	277 (28.0%)	833 (38.0%)
Economic Status			
Non-poor	901 (74.0%)	764 (77.3%)	1,665 (75.5%)
Poor	316 (26.0%)	224 (22.7%)	540 (24.5%)
Self Esteem	10.06 (2.64)	9.95 (3.05)	10.01 (2.83)
Educational Achievement			
Academic performance	3.62 (.84)	3.29 (.95)	3.46 (.91)
Adjustment to school	7.88 (1.51)	7.82 (1.52)	7.85 (1.52)

In the sample, 24.5% (n=540) of the students were students from low-income families. Twenty-six percent (n=316) of the elementary students and 22.7% (n= n=224) of the middle school students lived in low-income families, those who earned below 60% of median household income. The average scores with standard deviation of self-esteem for the elementary cohorts and the middle school cohorts were 10.06 with 2.64 and 9.95 with 3.05, respectively. The means (SD) of academic performance and adjustment to school in the elementary school sample were 3.62 (.84) and 7.88 (1.51), respectively. while the average scores (SD) of the variables in the middle school sample were 3.29 (.95) and 7.82 (1.52), respectively.

4.2. Direct Impact of Poverty on Educational Achievement

The direct effect of poverty on academic performance was represented after controlling for four covariates (Self-esteem, gender, child maltreatment, and bullying) using multiple linear regression. Poverty had a negative impact on academic performance in all samples (beta=-.268, se=.041***) as shown in column two in Table 2. The third and fourth columns in Table 2 show that poverty had a negative impact on academic performance in elementary students (beta=-.191, se=.049***) and middle school students (beta=-.391, se=.066***), respectively. The results show that poverty was an important factor to explain lower levels of academic performance in both elementary students and middle school students, controlling for child maltreatment, bullying, gender, and self-esteem.

Table 2 also shows that five variables: Economic status, self-esteem, gender, child maltreatment, and bullying explained 20.2 % of the total variance (r^2=.202) in academic performance of all samples. Among the covariates, gender, child maltreatment experience, and bullying were not statistically important variables to affect the average scores of academic performances of all samples. However, the results show the self-esteem significantly affects academic performance. In this regression model, there was a positive relationship between self-esteem and academic performance, controlling for other variables.

Table 2. Direct Effect of Poverty on Academic Performance

Dependent Variable: Academic Performance						
	All Samples		Elementary Student Sample		Middle School Student Sample	
Variables	Beta	Std. error	Beta	Std. error	Beta	Std. error
Economic Status						
Non-poor (ref.)		–		–		–
Poor	-.268	.041***	-.191	.049***	-.391	.066***
Gender						
Male (ref.)		–		–		–
Female	.030	.035	.003	.043	.062	.055
Child Maltreatment						
No experience (ref.)		–		–		–
Any experience	-.073	.039	-.008	.048	-.120	.062
Bullying						
No experience (ref.)		–		–		–
Any experience	.061	.037	-.067	.045	.091	.064
Self Esteem	.132	.006***	.145	.008***	.113	.009***
R Square	.202		.238		.186	

*p<.05, **p<.01, ***p<.001

Table 3 represents the direct impact of economic status on adjustment to school, controlling for four variables. Economic status and the levels of adjustment to school were negatively related in all samples (beta=-.245, se=.065***) using the linear regression model. However, after controlling for four covariates, economic status was not statistically

important to explain the levels of adjustment to school in elementary school students (beta=-.121, se=.083). On the other hand, economic status was a significant predictor of adjustment to school in middle school students (beta=-.417, se=.100***). There was a positive relationship between self-esteem and adjustment to school, controlling for other variables.

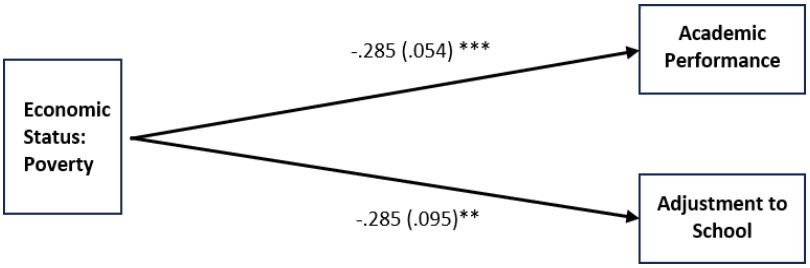
Table 3. Direct Effect of Poverty on Adjustment to School

Dependent Variable: Adjustment to School						
Variables	All Samples		Elementary Student Sample		Middle School Student Sample	
	Beta	Std. error	Beta	Std. error	Beta	Std. error
Economic Status						
Non-poor (ref.)		–		–		–
Poor	-.245	.064***	-.121	.083	-.417	.100***
Gender						
Male (ref.)		–		–		–
Female	.357	.055***	.446	.073***	.236	.083**
Child Maltreatment						
No experience (ref.)		–		–		–
Any experience	-.256	.062***	-.290	.082***	-.208	.094*
Bullying						
No experience (ref.)		–		–		–
Any experience	-.219	.059***	-.275	.076***	-.168	.097
Self Esteem	.248	.010***	.269	.014***	.226	.014***
R Square	.289		.314		.270	

*p<.05, **p<.01, ***p<.001

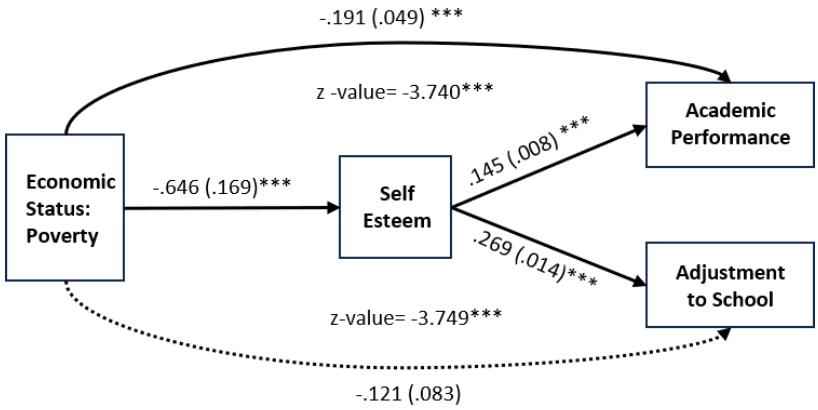
4.3. Mediating Effect of Self-esteem on Educational Achievement

Figure 1 shows that the direct effects of economic status on academic performance (beta=-.285, se=.054***) and adjustment to school (beta=-.285, se=.095**) in elementary students were statistically significant, only after controlling for three covariates: Gender, child maltreatment, and bullying. Figure 2 represents that the effect of poverty on self-esteem (beat=-.646, se=.169***), the effect of self-esteem on academic performance (beta=-.146, se=.088***) and adjustment to school (beta=-.269, se=.014***) were all statistically significant. Low-income elementary students were more likely to have lower levels of self-esteem, after controlling for covariates: Gender, child maltreatment, and bullying. As Figure 3 has shown, the effect of poverty on educational achievement was changed after considering the mediating effect of self-esteem.



*p<.05, **p<.01, ***p<.001

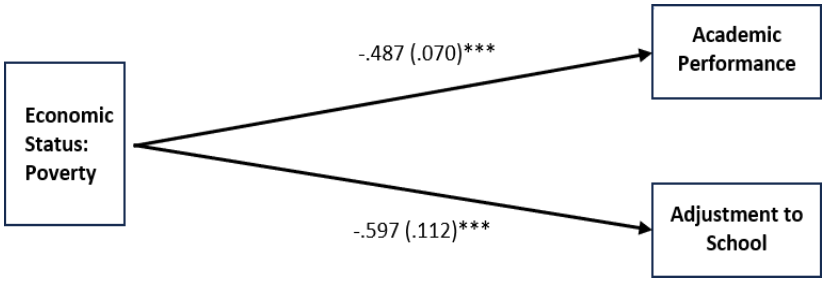
Figure 1. Direct Effect of Poverty (Elementary Students)



*p<.05, **p<.01, ***p<.001

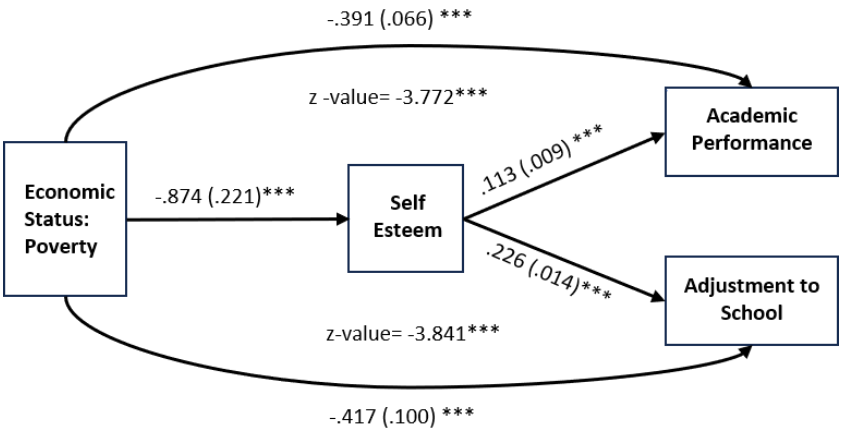
Figure 2. Mediating Effect of Self Esteem (Elementary Students)

The Sobel tests indicate that self-esteem mediated the relationship between poverty and academic performance (z=-3.704***) and adjustment to school (z=-3.749***) in elementary students. Even after considering the mediating effect of self-esteem, there was a direct effect of poverty on academic performance. This suggests that self-esteem has a partial mediating effect on the relationship between poverty and academic performance in elementary students. However, as the dotted line has shown in Figure 2, significant direct effect of poverty on adjustment to school disappeared after considering the mediating effect of self-esteem. This means that self-esteem fully mediated the association between poverty and adjustment to school in elementary students.



*p<.05, **p<.01, ***p<.001

Figure 3. Direct Effect of Poverty (Middle School Students



*p<.05, **p<.01, ***p<.001

Figure 4. Mediating Effect of Self Esteem (Middle School Students)

Figure 3 shows the direct effects of economic status on academic performance and adjustment to school in middle school students. Like elementary student sample, poverty significantly affects academic performance (beta=-.487, se=.070***) as well as adjustment to school (beta=-.597, se=.112***) without excluding the effect of self-esteem. The Sobel tests in Figure 4 show that self-esteem mediated the relationship between poverty and academic performance (z=-3.772***) and adjustment to school (z=-3.842 ***) in middle school students. In other words, poverty might have a negative impact not only directly on the levels of educational achievements but also indirectly by negatively influencing self-esteem.

5. Discussion

The goal of this study was to examine the effect of poverty on educational achievement and the mediating effect of self-esteem on the association between poverty and educational achievements in Korean elementary and middle school students. This study specifically investigated different effects of poverty and self-esteem on academic achievement and adjustment to school by developmental status (elementary students vs. middle school students).

As expected in hypothesis1, children in low-income families have poorer academic performance and adjustment to school than children in moderate- or high-income families, when controlling for self-esteem and bullying, child maltreatment, and gender. Poverty negatively impacted educational achievements. Results also showed that the effect of poverty on academic performance and adjustment to school differed according to students' life stages (children vs. early adolescents). Poverty was a significant predictor of academic performance in elementary and middle school students, regardless of gender, bullying experiences, child maltreatment, and self-esteem. However, poverty did not directly determine the levels of adjustment to school in elementary students. On the other hand, poverty was still an important factor to explain the levels of adjustment to school in middle school students. The result implies that poverty might have a more negative impact on educational achievement in early adolescence, where peer groups are more socially important (Erikson, 1950).

The results of hierarchical linear model indicate mediating effect of self-esteem on the relationship between poverty and educational achievement. First, children in middle-upper income families were more likely to have higher levels of self-esteem compared to low-income children. This has been suggested by social causation theorists who have stressed economic status to understand the different levels of psychological health (Dohrenwend et al., 1992). Second, children who had higher levels of self-esteem were more likely to have better educational achievement, regardless of gender, bullying, and child maltreatment. The findings of this study confirmed hypothesis 2: Self-esteem mediated the effect of poverty on academic performance and adjustment to school. This empirical finding also supports Rutter (1987) and Gilligan (2000)'s resilience framework.

The findings also contribute to a further understanding of how self-esteem mediated the effect of poverty on academic performance and adjustment to school differently by students' developmental stages. Self-esteem partially mediated the association between poverty and academic performance in elementary and middle school students. This finding supports the HPF model emphasizing the role of family economic status is a determinant of the levels of educational achievements. Family economic status influences academic performance in both late childhood and early adolescence (Becker, 1965; Taubman, 1989).

There was also a *partial mediating effect* of self-esteem on the relationship between poverty and adjustment to school in middle school students. Poverty and self-esteem were both significant components for changing the levels of adjustment to school for middle school students. These results extend existing literature on the roles of family economic status and psychological factors that predict educational achievements in the HPF model and the resilience framework (Becker, 1965; Gilligan, 2000).

However, self-esteem had a *full mediating effect* on the relationship between economic status and adjustment to school in elementary students. This suggests that poverty did not directly influence the change of levels of adjustment to school of elementary students, but economic status indirectly influenced it through self-esteem. In other words, low-income elementary children were likely to have a lower level of self-esteem than middle-upper income children. And low levels of self-esteem negatively affected levels of adjustment to school of elementary students.

The developmental perspectives provide a theoretical framework to understand the different effects of poverty and self-esteem on adjustment to school between children and early adolescents. Since elementary students tend to understand reality through social rules and public opinion, the roles of teachers and formal education might be more important to establish the self-esteem of children compared to early adolescents (Kohlberg, 1984; Piaget, 1963). Thus,

encouraging the heightening self-esteem of elementary students might be useful to enhance the degree of adjustment to school. On the other hand, middle school students, who try to form identity through interaction with peer groups, might be more sensitively responsive to their family's economic status (Erikson, 1950; Piaget, 1963).

6. Limitations and Future Study

There are several limitations to this study that should be noted. As this study was conducted as a secondary data analysis based on data from the Korean Welfare Panel Study [KWPS], this study did not create questionnaires to measure all the variables. The first limitation is related to the fact that the KWPS did not use standardized instruments with acceptable validity and reliability when measuring two continuous variables: self-esteem and adjustment to school. To overcome the limitation in measurement, this study calculated the reliability of both questionnaires and found an acceptable level of internal consistency for measuring self-esteem (Cronbach's alpha = 0.77 to 0.84) and adjustment to school (Cronbach's alpha = 0.64 to 0.66), which ranges between 0.6 and 0.8 (Cronbach, 1951; Raharjanti et al., 2022).

Adjustment to school, academic performance, self-esteem, gender, and experiences of child maltreatment and bullying were measured by students completing self-report questionnaires. Collecting data through self-reported surveys is subject to systematic errors such as social desirability bias and random errors such as fatigue, moods, and environments at the time of data collection (Engel & Schutt, 2017). However, the relatively large sample size (n=2,205) in this study should reduce the likelihood of the two types of measurement errors.

This study was not conducted through an experimental research design. Thus, the relationship between poverty and school achievement cannot be interpreted as a cause and an effect. To reduce the limitations of a correlational study, this study used a cohort study and a panel study to investigate the effect of poverty on school achievement after controlling for covariates, using multiple linear regression analysis. This study also examined the mediating effect of self-esteem on the association between poverty and school achievement of Korean elementary and middle school students using the Sobel test. For a causal analysis, future research should consider experimental research designs to examine how cash assistance policies for addressing poverty affect self-esteem and educational achievement.

This study revealed important findings about the effects of poverty on academic performance and adjustment to school of Korean students. However, it did not explain the relationship between academic performance and adjustment to school. This study showed that developmental status can be an important factor to consider when developing policies to enhance educational achievement based on the SEED model. However, this study only included elementary school students and middle school students as study populations. Future research could look at a wider range of students to see what policies and practices might be best based on a child's developmental status in the SEED model.

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