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Relationship of perceived parenting styles to academic performance and self-esteem of science-gifted high school students

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Little empirical study has been conducted to figure out how environmental factors including family, school, and peers are related to academic and affective characteristics of science-gifted high school students. This study investigated the relationship of perceived parenting styles to academic performance and self-esteem of the 10th grade science-gifted students (N=141) who are relatively homogeneous with high intellectual capability. Simple regression analysis was employed to understand the relationship. Out of the four sub-categories of parenting styles, only achievement-oriented parenting style of both mother and father was found to account for 6.5 percent and 4.5 percent of the variance of grade point average, respectively. Love-oriented parenting of both mother and father perceived by the participants explained 15 percent of the variance of self-esteem, respectively. These results are significant in terms of pinpointing the specific parenting styles that are associated with both academic performance and self-esteem of science-gifted high school students. Further research was suggested that can help understand the characteristics of science-gifted high school students.

Key words : science-gifted students, parenting styles, self-esteem, academic performance

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An individual's behavior is assumed to be a product of the environment, genetics, and intrapersonal variables (Bell, Fisher, Baum, & Greene, 1990). Behavior may be either observable motoric behavior or an inner affective response (Lawton, 1975). The individual's observable behavior and psychological state can be appropriately understood with knowledge of the circumstances in which the individual is situated (Eckert & Murrey, 1984).

Being intellectually gifted does not assure academic success or productivity (Rimm, 1997). Academic performance or achievement as an individual's behavior can be understood as a product of both environmental and personal factors. According to McNabb (1997), two environmental sources such as family and school are associated with academic performance. Rimm (1986, 1995) further supports with research findings that family, school, and/or peer environments appear to be the determinants that make gifted children either move toward high achievement or fall into underachievement.

Research on family has shown that there is a significant difference in relationships among the family members and their parents between high-achieving gifted students and underachieving gifted students (Rimm, 1995). Parents also play a crucial role in the self-esteem development of their children. Research shows that parenting styles are significantly associated with self-esteem development, which influences ego-identity establishment during the adolescence (Cassidy,

1988; Harter, 1988).

Parenting styles refer to general parental behaviors or attitudes of parents exhibited toward their children. Based on her research on parents' behavior toward children, Baumrind (1980) classified parents into three categories such as permissive parents, authoritarian-restrictive parents, and authoritative parents. Parenting styles are found to be associated with family structures, family climate, family socio-economic status, and cultural background (Chao, 1994; Plomin & Bergemen, 1991).

A longitudinal study (Baumrind, 1991) found out that parenting styles affect children's socialization as well as intellectual development. Those children who are raised under authoritative parents who demonstrate both love and stern discipline to children when needed have been found to show high social skills and intellectual capability, demonstrating both high self-confidence in interpersonal relationship and academic work in school. These positive effects appear to last by the adolescent period.

Children raised under the authoritarian parents have shown such problems as both interpersonal relationship and academic performance. In addition, parents who are too permissive and inattentive toward their children raise children with personality characteristics including impulsivity, aggressiveness and low self-esteem. These children show very poor social skills and academic performance. Further, they are likely to become delinquents during the adolescence (Patterson et

al., 1992).

Research on family structural characteristics and family climate between high-achieving gifted students and underachieving gifted students showed that there was no significant difference in family structural characteristics between the two groups of gifted students (Rimm, 1995). There, however, was some difference in family relationship. Family of high achieving gifted students was found to have good relationships among the family members and their parents were consistent in parenting style with nonauthoritarian attitude. On the contrary, the family relationship among underachieving gifted students was poor and parents were inconsistent with parenting styles, showing a significant discrepancy in parenting styles between them. Even in the development of both giftedness and creativity parenting has been consistently found to be the most important factor (Bloom, 1985; Kulieke & Olszewski-Kubilius, 1989; Tannenbaum, 1992).

Appropriate parental control of children has been found to be a potent factor that facilitates desirable growth and development during the childhood. Thus, family structure either patricentric or matricentric is more likely to raise children as adolescent with high responsibility and confidence compared to egalitarian family structure (Bronfenbrenner, 1979, 1986). Parental involvement has led their children to become successful experts in their specialty field as parents manage time for their children as well

as exercise pressure for them to work on their field persistently (Subotnik & Jarvin, 2005).

In this respect, parent-child attachment during the adolescence appears to be the crucial factor that affects the quality of adolescent's life including social competency, emotional adjustment, self-esteem, and physical health (Kobak et al., 1993). Children are inclined to have low self-esteem when they believe that they are not accepted by their parents. These children do not have a sense of stability about their existence, showing high anxiety and tension (Crockenberg & Litman, 1990).

According to the research (Haynes, Hamilton-Lee, & Comer, 1988), many students have difficulty in school not because of their poor intelligence or ability but because of their evaluation that they are not able to perform well. What makes the matter worse is the self-esteem has a ripple effect. That is, success or failure in a particular task can lower or raise the self-evaluation on his or her ability for the particular task and the evaluation made is generalized toward other tasks (Ludwig & Meahr, 1967; Haynes, Hamilton-Lee, & Comer).

There is close relationship between self-esteem and achievement-oriented behavior. Underachieving children usually show low self-esteem (Davis & Rimm, 1994; Fine & Pitts, 1980). Those who have inappropriately low self-esteem were found to demonstrate poor learning motivation with lack of interest in new task even though they have outstanding academic skills (Phillips, 1984,

1987). Underachievers with low self-esteem are likely to avoid academic tasks, which consequently prevents them from developing appropriate academic skills. Besides, their low self-esteem may bring forth their sense of low personal control over their own lives (Rimm, 1995). When they fail at a task, they may blame that their lack of ability. If they succeed, they may attribute their success to luck. This kind of attribution may lead them to experience learned helplessness (Felton & Biggs, 1977).

Given the influence of family environment on both intellectual and social development of children, it is important to investigate how parenting styles are related to academic performance as well as self-esteem of gifted students. There is little empirical study on how family environment such as parenting is related to intellectual and social development of gifted students in Korea.

Our behavior is affected by how we perceive and interpret a situation or an event, not by the event itself. In a recent study (Chan, 2005), it was found that gifted students with high academic achievement perceived their families as cohesive and their parents as demonstrating high expectations of them. For this study, parenting styles perceived by children were investigated to figure out how they are associated with their academic performance and self-esteem.

In this study, the following research hypotheses were examined:

(1) Perceived parenting styles will be associated

with academic performance of the study participants.

(2) Perceived parenting styles will be related to self-esteem of the study participants.

Method

Study Participants and Procedure

The first year students (10th grade, N=144) at Korea Science Academy (KSA) participated in this study. There were 29 female and 115 male students. Twenty-one students entered KSA after finishing two years in middle school. There were 2 male students who got into KSA after finishing one year in middle school. All of the first year students were selected nationwide after passing multiple identification processes among more than 2,300 applicants. They were administered the instruments used in this study just before their final exam of the first semester. Three male students out of 144 students did not respond appropriately so that their data were not used in the data analysis.

Measures

Parenting styles scale developed by Oh and Lee (1982), which consists of 60 items, was used to measure perceived parenting styles. Parenting styles of this instrument were classified into four sub-categories such as love versus hostility,

autonomy versus control, achievement versus non-achievement, and rationality versus irrationality. Each sub-category is composed of 15 items. Participants of this study were asked to respond to the items on both father and mother. Responses include 'mostly agree' (1), 'agree' (2), 'disagree' (3), and 'not at all' (4). Low score of each sub-category indicates perceived love-, autonomy-, achievement-, and rationality-oriented parenting. Overall reliability of the parenting styles of father was .90. Reliabilities of its sub-categories were as follows: love .76, autonomy .79, achievement .57, and rationality .78. Reliability of the parenting styles of mother was .93 with its sub-category reliabilities such as love .84, autonomy .78, achievement .69, and rationality .80.

Self-esteem was measured with the instrument developed by Rosenberg (1989). Response category ranges from 'do not agree mostly' (1), 'so so' (2), 'agree mostly' (3), and 'agree all the time' (4). Its reliability was .82. High score means high self-esteem.

In order to understand the intellectual capability of the study participants, intelligence quotient (IQ) was measured with a comprehensive aptitude test developed by Korea Behavior Science Research Institute (2000). IQ was calculated as a composite score of four sub-categories of the test that measures verbal, numeric, perceptual, and inferential ability.

GPA was measured as the average grade on all the subjects the first year students took in

common during their first semester at KSA. As the GPA was given in letter, their letter grade was transformed to the equivalent score ranging from 12 for A+ to 0 for F. Each grade level was given +, 0, and - as in A+, A0, and A-.

Data Analysis

Independent t-tests were conducted to figure out the group differences between male and female students. Bivariate correlation was calculated to see the relationship between the parenting sub-scales of mother and father. Cronbach a's were also calculated. Simple regressions of parenting styles on both GPA and self-esteem were applied to understand how much variance of both GPA and self-esteem parenting styles are able to explain. SPSS version 10.0 was used for the data analysis.

Results

Participants of this study showed high intellectual capability with mean IQ of 139.35 and standard deviation of 8.57. Their GPA mean was 3.64 out of the maximum 4.30 with standard deviation of .38. These means and standard deviations indicate small individual differences among the study participants.

In order to understand the group difference between male and female participants, descriptive statistics on IQ, self-esteem, and GPA were

Table 1. Means and standard deviations of the groups of male (N=112) and female (N=29) students

| Variables | <i>M</i> | <i>SD</i> | <i>p</i> |
|-------------|----------|-----------|----------|
| IQ | | | |
| Male | 139.11 | 8.79 | .47 |
| Female | 140.31 | 7.73 | |
| GPA | | | |
| Male | 3.62 | .39 | .18 |
| Female | 3.72 | .32 | |
| Self-esteem | | | |
| Male | 29.45 | 5.00 | .41 |
| Female | 30.31 | 5.03 | |

shown in Table 1.

Independent t-tests detected no group differences in IQ, GPA, and self-esteem between male and female students. None of the three variables reached the statistically significant level

of .05 in t-tests. Thus, the study participants can be classified as a homogeneous group with little variability when means and standard deviations were taken into account.

In order to understand group differences in parenting sub-categories between male and female students, t-tests were implemented as shown in Table 2.

Table 2 showed that there is a statistically significant group difference in perceived parenting styles between male and female students. Although there exists sample size difference between the two groups, male participants scored higher than female students on every sub-category of parenting. This group difference indicates that male students perceive their parents as less favorable than female students in terms of love-, autonomy-, achievement-, and

Table 2. Group differences in parenting sub-scales between male and female students

| Variables | <i>M</i> | <i>SD</i> | <i>t</i> | <i>p</i> | Variables | <i>M</i> | <i>SD</i> | <i>t</i> | <i>p</i> |
|---------------|----------|-----------|----------|----------|---------------|----------|-----------|----------|----------|
| f-love | | | | | m-love | | | | |
| male | 28.79 | 5.56 | 3.62 | .001** | male | 27.83 | 5.40 | 4.17 | .000** |
| female | 24.48 | 5.55 | | | female | 23.21 | 5.19 | | |
| f-autonomy | | | | | m-autonomy | | | | |
| male | 31.69 | 5.60 | 4.17 | .000** | male | 32.31 | 5.20 | 2.56 | .015* |
| female | 27.22 | 4.78 | | | female | 29.19 | 5.78 | | |
| f-achievement | | | | | m-achievement | | | | |
| male | 29.73 | 5.77 | 2.44 | .019* | male | 29.39 | 4.64 | 2.54 | .016* |
| female | 26.92 | 5.15 | | | female | 26.56 | 5.11 | | |
| f-rationality | | | | | m-rationality | | | | |
| male | 29.73 | 5.36 | 2.72 | .010* | male | 30.19 | 5.73 | 3.25 | .002* |
| female | 26.60 | 5.12 | | | female | 26.40 | 5.12 | | |

$p < .05^*$; $p < .01^{**}$; f- indicates father while m- means mother.

Table 3. Correlations of parenting styles between mother and father perceived by the study participants

| Variables | f- love | f- autonomy | f- achievement | f- rationality | m- love | m- autonomy | m- achievement | m- rationality |
|---------------|------------|----------------|-------------------|-------------------|------------|----------------|-------------------|-------------------|
| f-autonomy | .69** | | | | | | | |
| f-achievement | .62** | .44** | | | | | | |
| f-rationality | .77** | .71** | .54** | | | | | |
| m-love | .85** | .64** | .61** | .72** | | | | |
| m-autonomy | .57** | .77** | .34** | .64** | .65** | | | |
| m-achievement | .58** | .47** | .75** | .60** | .71** | .46** | | |
| m-rationality | .69** | .66** | .50** | .84** | .81** | .73** | .69** | |
| self-esteem | -.42** | -.18* | -.29** | -.29** | -.40** | -.23** | -.34** | -.30** |

$p < .05^*$; $p < .01^{**}$

rationality-oriented parenting.

Bivariate correlations of sub-scales of parenting by father and mother were calculated. They were presented in Table 3.

As shown in Table 3, there were strong relationships between perceived parenting styles of father and mother. Strong correlation indicates that participants of this study perceived consistent

Table 4. Simple regression of parenting styles on GPA

| Parenting styles | Beta | <i>t</i> | <i>p</i> | R | R ² | Adjusted R ² |
|------------------|------|----------|----------|------|----------------|-------------------------|
| f-love | -.01 | -.07 | .94 | | | |
| f-autonomy | -.07 | -.48 | .63 | | | |
| f-achievement | .31 | 2.77 | .00** | | | |
| f-rationality | -.20 | -1.30 | .20 | | | |
| | | | .05* | .279 | .078 | .046 |
| m-love | -.09 | -.54 | .59 | | | |
| m-autonomy | -.01 | -.06 | .95 | | | |
| m-achievement | .41 | 3.11 | .00** | | | |
| m-rationality | -.33 | -1.85 | .07 | | | |
| | | | .02* | .309 | .096 | .065 |

$p < .05^*$; $p < .01^{**}$

Table 5. Simple regression of parenting styles on Self-esteem

| Parenting styles | Beta | t | p | R | R ² | Adjusted R ² |
|------------------|------|-------|-------|------|----------------|-------------------------|
| f-love | -.41 | -2.71 | .01** | | | |
| f-autonomy | .12 | .96 | .34 | | | |
| f-achievement | -.14 | -1.30 | .20 | | | |
| f-rationality | .01 | .08 | .94 | | | |
| | | | .00** | .423 | .179 | .150 |
| m-love | -.32 | -2.03 | .05* | | | |
| m-autonomy | .04 | .32 | .75 | | | |
| m-achievement | -.22 | -1.76 | .08 | | | |
| m-rationality | .07 | .41 | .68 | | | |
| | | | .00** | .422 | .178 | .149 |

$p < .05^*$; $p < .01^{**}$

parenting between father and mother. In addition, each sub-category of parenting was significantly related to self-esteem.

To address the research hypotheses (1) and (2), simple regressions of parenting styles on both GPA and self-esteem were conducted. Multicollinearity was checked among the parenting sub-scales. It was found out that there exists multicollinearity in love- and rationality- oriented parenting when the variance inflation factor was considered. All of the four sub-scales, however, were used in the analysis to see the unique contribution of each sub-scale to GPA. As shown in Table 4, father's parenting explained 4.6 percent of the variance of GPA. Only achievement-oriented father's parenting was significantly related to GPA. Mother's achievement-oriented parenting was also found to

account for 6.5 percent of the GPA variance.

Table 5 showed the results of simple regression of parenting styles on self-esteem. Love-oriented parenting of both father and mother was found to explain 15 percent and 14.9 percent of the variance of self-esteem, respectively. Explanatory power of love-oriented parenting by father and mother was almost the same.

Discussion

According to the results of simple regression of parenting on GPA, achievement-oriented parenting of both father and mother is significantly related to actual academic performance of children, explaining 4.6 percent

and 6.5 percent of the variance of GPA. This result is consistent with the findings on the positive influence of parenting on children's academic achievement (McNabb, 1997; Rimm, 1997). Parental support and encouragement for high academic performance appears to be an important factor for the science-gifted students to exert themselves academically. This result indicates that those parents who have high expectations of their children may raise children who make efforts to meet parents' expectations of them.

Result on simple regression of parenting on self-esteem showed that love-oriented parenting of both father and mother has significant association with self-esteem development of children. Love-oriented parenting of both father and mother accounted for 15 percent of the variance of self-esteem, respectively. This finding exhibits that children are able to develop positive self-evaluation and confidence of themselves when they are accepted with love by their parents. Significant role of parents for children's self-esteem development was supported in this study, which is consistent with other research (Baumrind, 1991; Patterson et al., 1992; Rimm, 1995). Even to adolescents like this study participants, to establish and maintain affective relationship with parents is greatly important for them to develop positive self-esteem. In particular, importance of the mother-child relationship cannot be too much exaggerated.

Results of this study demonstrate that

ecological influence should be taken into account when we try to understand science-gifted adolescents in terms of their adjustment to school life including academic performance and social development. These results also show that parenting perceived by the study participants is more closely related to their self-esteem than to their academic performance. As not much variance of GPA was explained by parenting styles perceived by the study participants, other factors including motivation and learning strategies should be studied to fully understand academic achievement of science-gifted high school students.

Findings of this study are significant in showing specific parenting such as achievement-oriented parenting and love-oriented parenting with respect to their relationship to academic performance and self-esteem of children, respectively. There also existed gender difference in perceiving parenting. Female students perceived their parents as more favorable on every parenting style than male students. Thus, these findings imply that parents be provided with information on parenting in terms of its relationship to academic performance, self-esteem development, and socialization of their children.

Generalization of the study results, however, raises some concerns because participants of this study are relatively homogeneous in IQ, self-esteem, and academic achievement. Little variability among the study participants may limit the interpretation of the study results to

the specific population such as the science-gifted high school students. Thus, further research to figure out the relationship of parenting to both academic performance and self-esteem needs to be conducted with other participants including normal high school students and adolescents.

Besides, there may be some difference in parenting perceived by parents and children. A follow-up study should be conducted to see the relationship of parenting perceived by parents to children's academic performance and self-esteem. When we take into account the characteristics of gifted students with high intellectual capability, qualitative study may shed light on the understanding of science-gifted students.

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고등학교 과학영재가 지각한 부모의 양육유형과 학업수행 및 자아존중감과의 관계

성 현 속 광 미 용 이 성 실

한국과학영재학교

본 연구는 높은 인지능력으로 동질성을 보이는 한국과학영재학교 1학년 학생들(N=141)이 지각한 부모의 양육유형이 그들의 학업수행 및 자아존중감과 어떠한 관련이 있는지를 연구하였다. 단순회귀분석 결과, 연구참여자가 지각한 아버지의 양육유형 중 성취중심의 양육유형이 학점의 4.6%를 설명하였고 어머니의 성취중심 양육유형은 학점의 6.5%를 설명하였다. 또한 연구참여자가 지각한 부모의 양육유형 중 아버지와 어머니의 사랑중심의 양육유형이 자아존중감의 분산을 각각 15%씩 설명하는 것으로 밝혀졌다. 본 연구의 결과는 자녀가 지각하는 부모의 양육유형의 하위영역 중 학업수행 및 자아존중감과 관련이 있는 구체적인 양육유형을 밝힌 것에 의의가 있다. 본 연구의 제한점을 포함하여 과학영재 고등학생이 보이는 특성의 이해를 도울 수 있는 향후 연구방향에 대하여 논의하였다.

주요어 : 과학영재, 지각한 부모의 양육유형, 학업성취, 자아존중감