

The Relationship Among Giftedness, Gender, and Overexcitability

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ABSTRACT

This study examines the relationship among giftedness, gender, and overexcitability. Previous studies examining these relationships were based on an open-ended questionnaire and small samples. This study uses a new self-rating questionnaire to assess overexcitabilities, the Overexcitability Questionnaire II, and findings are based on a large sample of 562 university students. Giftedness was measured by a student's participation in either a gifted, advanced, or standard curriculum program. Results show that previous findings on the relationship between giftedness and overexcitability can be confirmed; gifted students scored significantly higher on intellectual and emotional overexcitability than students in either of the other two programs. Further, males scored higher overall on intellectual, imaginal, and psychomotor overexcitability, while females scored higher on emotional and sensual overexcitability.

- *sensual overexcitability* refers to an individual's level of enriched sensory experience and perception through senses like taste and touch;
- *intellectual overexcitability* refers to pursuit of knowledge and search for the truth, expressed through discovery, questioning, love of ideas, and theoretical analysis;
- *imaginational overexcitability* refers to the domain of fantasy, dreams, dramatizations, inventions, grand associations, and a desire for the unusual; and, finally,
- *emotional overexcitability* refers to the strength of sensations and emotional experiences expressed through feelings, attachments, and compassion for others (Piechowski & Miller, 1995, p. 176). The last overexcitability describes emotional intensity and sensitivity, not emotionality (i.e. emotional unsteadiness).

These five forms of overexcitability are not age-related or developmentally specific. Dabrowski felt that potential for multilevel development remains steady throughout one's lifetime and that it is particularly affected by the strength of the emotional, intellectual, and imaginational OEs (Piechowski, 1979).

Overexcitability (OE) is a concept translated from Polish that means superstimulated (Falk & Piechowski, 1992). The term has been used to describe the five forms of heightened experiencing that contribute to the developmental potential of gifted children. Developmental potential is defined as "the individual's constellation of talents, special abilities, and intelligence, plus five ways of processing the data of experience" (Piechowski & Miller, 1995, p. 176) or what Dabrowski (1967) referred to as "forms of psychic overexcitability." In Dabrowski's theory, overexcitabilities are part of the inherent makeup of the gifted, creative individual. Dabrowski assessed developmental potential through five forms of overexcitability: psychomotor, sensual, intellectual, imaginational, and emotional. Piechowski (1979) referred to these forms of overexcitability as dimensions of mental functioning in the model for developmental potential. They are described as follows:

- *psychomotor overexcitability* refers to a person's level of energy in terms of physical activity, movement, and compulsive actions;

PUTTING THE RESEARCH TO USE

With increasing precision, we can see a clear relationship between emotional and intellectual overexcitability and students enrolled in gifted programs. Gifted students are multi-dimensional. Emphasis on their development in multiple domains needs to be built into their educational programs. Gender differences also need to be taken into account. Gender socialization begins early in life. Administrators and teachers of gifted and talented programs must become increasingly aware of their own involvement in creating gendered orientations.

The OEQ II introduced in this study provides a new tool for understanding students. Researchers and educators can more easily explore the various ways in which overexcitabilities may relate to other facets of interest in the educational process.

Gifted and Talented and the OEs

Researchers have explored the relationship between giftedness and OE (Ackerman, 1997; Falk, Manzanero, & Miller, 1997; Gallagher, 1985; Lysy & Piechowski, 1983; Miller, Silverman, & Falk, 1994; Piechowski & Colangelo, 1984; Piechowski & Cunningham, 1985; Piechowski, Silverman, & Falk, 1985; Schiever, 1985; Silverman & Ellsworth, 1981), and all have found OE to differentiate between gifted and nongifted individuals in various ways. Several of these studies have found all five OEs to be stronger in the gifted groups when compared to the nongifted (Ackerman; Gallagher; Miller et al.; Piechowski & Colangelo; Piechowski & Cunningham; Silverman & Ellsworth).

Although the majority of these studies have found the gifted to score higher on three of the five OEs (emotional, intellectual, and imaginal) when compared to the nongifted, three studies found emotional, imaginal, and psychomotor to be the dominant OEs for some gifted individuals (Ackerman, 1997; Gallagher, 1985; Schiever, 1985). In addition, Silverman and Ellsworth (1981) found sensual OE to be higher for a sample of gifted adults than predicted by the theory. Despite these variations in results, overall, previous studies show that gifted individuals possess characteristics exemplified by the OEs.

Gender and Overexcitability

The relationship between gender and personality, as measured by the OEs, has been examined in several previous studies (Ackerman, 1997; Ammirato, 1987; Bouchet, 1998; Breard, 1994; Lysy & Piechowski, 1983; Miller et al., 1994; Piechowski & Cunningham, 1985; Piechowski & Miller, 1995; Piirto, Cassone, Ackerman, & Fraas, 1996). Both Miller et al. and Bouchet found that women had higher ratings on emotional OE while men had higher ratings on intellectual OE. Other studies (Ackerman; Ammirato; Piechowski & Cunningham; Piirto, Cassone, Ackerman, & Fraas) support the finding of higher emotional OE scores for females. Ackerman additionally found that women had higher imaginal OE scores.

In a study of fourth and fifth graders, Breard (1994) showed that mean profiles were higher for girls on emotional, intellectual, imaginal, and sensual OE and higher for boys on psychomotor OE. Lysy and Piechowski's (1983) earlier research with graduate students also found that males scored higher on psychomotor OE than females. As noted by Miller et al. (1994), gender differences in OEs "seem to be related to areas in which males and females have been differentiated by traditional socialization" (p. 33).

Gender Socialization

Previous studies show one consistent finding: Emotional OE has been higher for females and intellectual and psychomotor OEs have been higher for males. Sensual OE has been higher for females in many cases. These findings are reflective of traditional gender-role expectations. Our society socializes males to express intellectual and psychomotor abilities, while females generally are socialized to do the opposite, by inhibiting such intellectual and psychomotor abilities. Similarly, females are socialized to express sensuality while males are expected to hide sensuality. The effects of socialization, therefore, clearly must be considered when examining the expression of the OEs.

Sociological research on gender socialization (Thorne, 1986; Hochschild, 1983; Lombardo, Crester, Lombardo, & Malthis, 1983) illustrates that people express or inhibit certain emotions based on their "gender appropriateness." Due to gender socialization, men and women have been taught to express or "manage" their emotions differently. Men and women, therefore, participate in "emotion management" by holding back the expression of emotions that they believe are inappropriate for their gender and by forcing the expression of those emotions deemed appropriate. It follows, therefore, that women may express emotional reactions more intensely than men because they have been socialized to do so.

The family, peer group, school, and media serve as pervasive agents of socialization that instill gendered beliefs in children. Parents begin the process of gender socialization by choosing clothing and toys that reflect their gender expectations. They choose more sensual clothes for girls, marked with bows, floral fabrics, and lace, and more sensual toys, such as dolls or stuffed animals that require "hugging, stroking, and tender loving care" (Lott, 1994, p. 40). In contrast, parents choose more imaginal toys for boys, such as blocks and building sets (Richardson & Simpson, 1982), as well as other toys that encourage psychomotor activities, such as balls that encourage bouncing, throwing, or kicking (Lott). Boys are socialized to participate in highly competitive psychomotor activities, such as rule-oriented sports with a large number of participants, while girls are socialized to play games in small groups of two or three that involve minimal competition (Ignico & Mead, 1990). Young girls put more emphasis on being well liked by other girls, while socializing each other to be sensitive and have greater empathy for others' feelings (Eder & Parker, 1987; Eder & Sanford, 1986). In school, boys are not discouraged from yelling out an answer without being called on, while girls are encouraged to be compliant and wait for the teacher to call on them (Sadker & Sadker, 1994). Finally, the media contribute by portraying

Table 1***Demographic Characteristics of Sample***

Demographics	<i>n</i>	<i>Percent</i>
<i>Schooling Category</i>		
Gifted	142	25.3
Advanced Placement	131	23.4
Standard	288	51.3
<i>Sex</i>		
Male	200	35.6
Female	362	64.4
<i>Race/Ethnicity</i>		
White	356	63.9
White Ethnic	80	14.4
African American	91	16.3
Asian American	9	1.6
Hispanic	2	.4
Native American	1	.2
Other	18	3.2
<i>Rank</i>		
Freshman	276	49.4
Sophomore	130	23.3
Junior	67	12.0
Senior	86	15.4
<i>Age</i>		
17 or below	7	1.3
18–21	362	64.8
22–25	105	18.8
26–29	32	5.7
30–33	18	3.2
34–37	8	1.5
38–41	9	1.7
42–45	6	1.2
46–49	7	1.3
50+	5	1.0
<i>Age</i>	Mean = 22.32 Mode = 19.0 SD = 6.47	

male characters as aggressive, constructive, and direct, while females are generally depicted as acting deferential toward others (Basow, 1992). Such differential treatment leads to differential development.

The literature review suggests the following hypotheses to be investigated in this study.

1. Individuals who attended gifted and talented school programs will have emotional, intellectual, and imaginal

OEs that exceed those of individuals in comparison groups who have not attended such programs.

2. There will be gender differences in the OE scores. Females will score higher on emotional and sensual OEs and males will score higher on intellectual and psychomotor OEs.

Method

Subjects

The sample of 562 college students was obtained from a population of undergraduate students at a large midwestern university. The sample was selected primarily through Introduction to Sociology classes, although a few advanced sociology classes also were used. All students in the selected classes were given the opportunity to complete the questionnaire voluntarily. With the exception of class rank and age, the demographics of this sample were representative of the larger population of undergraduate students at the university. See Table 1 for a description of each demographic category.

Measures

The independent variables are schooling category and gender. Schooling category was designated on the following basis: Students were asked to report if they had participated in a program for gifted or talented children or if they had ever taken Advanced Placement classes in high school or college. All respondents who indicated participation in a gifted or talented category were assigned to the gifted category. Students who indicated Advanced Placement participation only were assigned to the advanced category. Finally, students who did not indicate participation in either a gifted or Advanced Placement category were assigned to the standard category. The number of subjects in each category was 140, 129, and 281, respectively.

In the gender categories, there were 200 males and 362 females. Two covariates—social class, measured with the Two Factor Index of Social Class Measurement (Hollingshead, 1957), and age—were used as control variables.

Overexcitability Questionnaire II (OEQ II). The dependent variables for this study are the five dimensions of overexcitability: emotional, intellectual, imaginal, sensual, and psychomotor. Prior studies have used a 21-item open-ended questionnaire to assess OEs. In those studies, questionnaires were coded by two trained raters followed by some type of consensus scoring procedure. This is an extremely time-consuming process that has led researchers to use small samples.

The current study uses a newly developed self-rating questionnaire, the Overexcitability Questionnaire II (OEQ II;¹ Falk, Lind, Miller, Piechowski, & Silverman, 1999). The self-rating questionnaire allows for larger samples and a more rigorous and objective testing of hypotheses. It also provides greater efficiency in coding. In general, subjects find it is easier to respond to a self-rating questionnaire than to write responses to open-ended questions.

The development of the self-rating questionnaire began by examining the responses to more than 300 open-ended OE questionnaires from several studies. A total of 124 items were originally developed (Falk & Lind, 1999) at an eighth-grade reading level. With a sample of 562 university students, a principal components analysis with varimax rotation of these items showed 50 items distributed equally across five factors. Another sample of 324 subjects was generated by researchers in Canada and the United States for instrument validation. Educators at national conferences were asked to volunteer to collect the 124-item OEQ II in their classrooms. This data was compiled and analyzed as a second sample. Although subjects were younger by approximately five years, analysis of the sample replicated the first with only minor item fluctuations. The two samples were combined ($N = 852$ listwise), and a final principal components analysis with varimax rotation was performed. This resulted in a stable factor structure of five 10-item factors, each easily named by one of the overexcitabilities. The items on each factor had loadings of .50 or above. Cronbach's alpha for scale reliability was high: .86 for psychomotor, .89 for sensual, .85 for imaginal, .89 for intellectual, and .84 for emotional.

An example of the items for each OE is as follows:

- Psychomotor. "When I have a lot of energy, I want to do something really physical."
- Sensual. "Viewing art is a totally absorbing experience."
- Intellectual. "Theories get my mind going."
- Imaginal. "Things that I picture in my mind are so vivid that they seem real to me."
- Emotional. "I can be so happy that I want to laugh and cry at the same time."

Subjects in this study responded to the new 50-item OEQ II on a Likert scale from 1–5, with 1 being "not at all like me" and 5 being "very much like me." Total scores were calculated for each overexcitability.

Results

Schooling Category and Gender Differences for OEs

A multivariate analysis of variance (MANOVA) was conducted using schooling category and gender as the indepen-

dent variables. Social class and age were used as covariates; the OE scores were the multiple dependent variables. The order of the entry in the equation was the covariates followed by the independent variables, schooling category, then gender. This reflects our interest first in the effect of group membership and second in the effect of respondents' gender on the dependent variables. One of the advantages of using MANOVA as opposed to ANOVA is that it protects against Type I errors due to multiple tests with correlated dependent variables (Tabachnick & Fidell, 1989).

The Wilks' Lambdas multivariate F results for the overall effect on the combined dependent variables were significant by both educational placement, $F(10, 1080) = 3.95, p < .001$, and gender, $F(5, 540) = 35.74, p < .001$, as well as by their interaction $F(10, 1080) = 2.29, p < .01$. These findings indicate that there are differences between the OE scores of the students in the gifted and talented category, in the Advanced Placement category, and in the standard category. There are gender differences, as well. Further, there was an interaction effect between schooling category and gender, which means that category differences were affected by gender.

To investigate the impact of each main effect (schooling category and gender) on the individual dependent variables, a stepdown analysis was performed in the following order: emotional OE, intellectual OE, imaginal OE, sensual OE, and psychomotor OE. In this procedure, the first dependent variable was tested in a univariate ANOVA. Then, each succeeding variable was tested with all preceding dependent variables treated as covariates. Results of this analysis, including the F -value for the test of the difference between the means, are summarized in Table 2.

When considering the differences in the students' schooling category, gifted and talented students exhibit significantly higher emotional and intellectual OE scores than students in either the Advanced Placement or standard categories. Further, students in the Advanced Placement category scored significantly higher on these OEs than the students in the standard category. Table 3 shows the mean emotional and intellectual overexcitability scores for each school category. Educational placement did not make a statistically significant difference in imaginal, sensual, and psychomotor OE scores.

The overall gender differences on the OEs are as follows. Males scored significantly higher than females on three of the five OEs (intellectual, imaginal, and psychomotor) while females score significantly higher on emotional and sensual (see Table 4 for a comparison of mean OE scores).

The covariates (age and social class), were not substantively significant. Age, while statistically significant, had no substantive impact. The lack of impact is evident in an interpretation of the regression weights. For example, for each year increase

Table 2

Tests of Schooling Category, Gender, and Their Interactions on OEs

Independent Variable	Dependent Variable	Stepdown <i>F</i>	df	<i>p</i>
Schooling Category	Emotional	6.92	2,544	.00
	Intellectual	10.38	2,543	.00
	Imaginational	.42	2,542	.66
	Sensual	.78	2,541	.46
	Psychomotor	1.31	2,540	.27
Gender	Emotional	79.96	1,544	.00
	Intellectual	41.96	1,543	.00
	Imaginational	26.47	1,542	.00
	Sensual	3.74	1,541	.05
	Psychomotor	10.77	1,540	.01
Schooling Category by Gender Interaction	Emotional	5.57	2,544	.00
	Intellectual	1.45	2,543	.24
	Imaginational	1.94	2,542	.14
	Sensual	1.03	2,541	.36
	Psychomotor	1.46	2,540	.23

in age over the mean age, emotional OE increases by .00021 units. Therefore, even though this finding was significant due to the large sample size, it is not substantively meaningful. Social class did not have a significant influence.

Interaction Effect Between Schooling Category and Gender

On emotional OE, females scored higher than males in all three schooling categories (the gifted, advanced, and standard). However, females in the middle category (advanced) scored lower when compared to females in the other categories, while males in the advanced program actually scored higher than males in the other two categories. This suggests that females and males in the advanced category are more similar on emotional OE (see Figure 1). In the other two categories, differences are greater between males and females, with females scoring substantially higher. Interaction effects occurred only for emotional OE scores.

Discussion and Conclusion

By comparing overexcitability scores of 562 college students, support was found for the hypothesis that gifted and tal-

Table 3

Comparison of Mean Overexcitability Scores Between Students in the Gifted and Talented, Advanced Placement, and Standard Categories

Overexcitability	Gifted		Advanced		Standard	
	Mean	SD	Mean	SD	Mean	SD
Emotional	3.87	.79	3.74	.44	3.66	.77
Intellectual	3.56	.72	3.35	.76	3.15	.76

ented students score higher on emotional and intellectual OE than students in the Advanced Placement or students in the standard categories. In addition, support was found for the hypothesis that there would be gender differences in the OE scores. Namely, females scored higher on emotional and sensual OE, while males scored higher on intellectual, imaginational, and psychomotor OE.

There was also a significant interaction effect between schooling category and gender for emotional overexcitability. While females scored higher than males in all school categories, differences between women and men were greater in the gifted and standard category groups than in the advanced. Interaction between schooling category and gender occurred for emotional OE scores. One possibility for this anomalous finding is that a disproportionate number of males in the Advanced Placement category should actually have been in the gifted category. This could happen either because they were not identified as gifted or their schools did not have an existing gifted program.

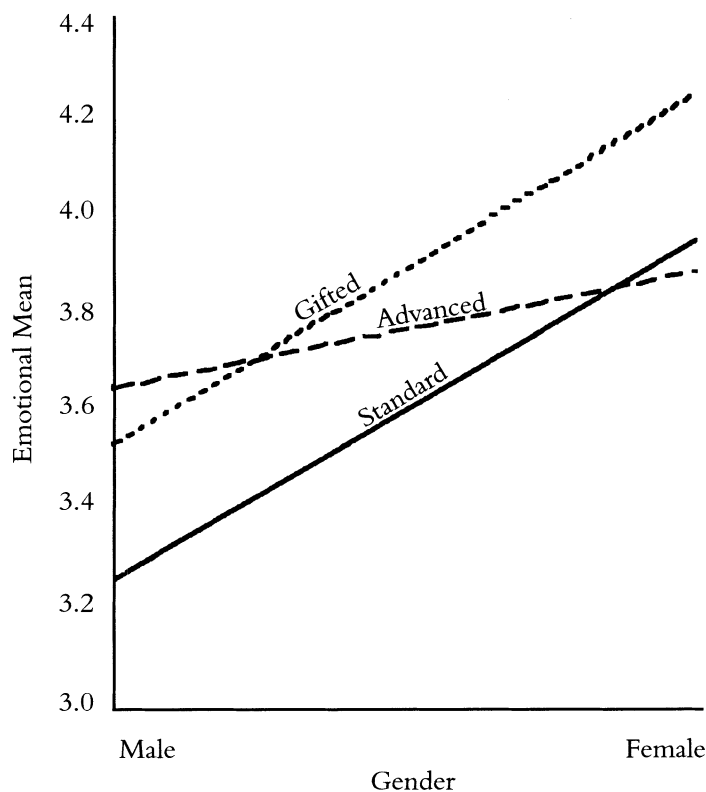
It should be pointed out that there are inherent weaknesses in using a college sample: It may not be a fair representation of either the entire American student population or the entire American population, in general. Most of the students in this sample, for example, were young, single, and full-time students. As such, they may be different in terms of their personality development compared to older, married, or nonstudents. These findings, therefore, need to be replicated with additional samples using different populations, as well as with other special populations, such as upper division college students and those with different majors.

The results of this study confirm the majority of previous findings concerning emotional and intellectual OEs in relation to giftedness. Although it is important to have further research verify these findings, the sweeping implication of this study is as follows. Gifted and nongifted students score differently on emotional and intellectual OEs. Due to the large sample size, this study provides greater generalizability than previous studies. Finally, despite previous findings of higher imaginational

Table 4

Comparison of Mean Excitability Scores Between Male and Female Students

Gender	Overexcitability									
	Emotional		Intellectual		Imaginational		Sensual		Psychomotor	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Male	3.33	.74	3.43	.77	2.89	.74	3.10	.85	3.56	.70
Female	3.95	.67	3.23	.76	2.76	.80	3.30	.83	3.40	.73

**Figure 1. Mean emotional OE by gender and schooling**

OE in the gifted, this study was unable to confirm that imaginal OE is higher in gifted than in nongifted groups.

The results of the current study also confirm the majority of previous findings concerning emotional and intellectual OEs in relation to gender. Females were higher on emotional OE, males on intellectual. This was the first study to find imaginal OE higher for males than for females. In keeping with gender stereotypes, females also were higher on sensual

OE and males on psychomotor OE. Clearly, the differences between males and females follow gender-role socialization patterns (Thorne, 1986). These patterns are consistent with previous findings with regard to emotional OE and not surprisingly with regard to sensual OE. Our culture encourages females to express emotional sensitivity (Brody & Hall, 1993) and sensuality, while males are expected to repress both. The differences between males and females apparently reflect the effect of gender-role socialization.

The differences in OEs between students who participated in gifted programs and those who did not may reflect the use of selection criteria that are related to intellectual OE, as well as to the effect of the programs themselves. As previous research suggests (Colangelo & Davis, 1997; Gallagher & Gallagher, 1994; Piirto, 1999), students are selected using criteria that are related to intellectual ability. Because many gifted students are not included in such programs, students in our highest category are probably limited to the "achieving gifted" since they had been in gifted programs and were attending college. Additionally, gifted programs probably develop and foster behaviors that reflect intellectual OE. There can be little question that the gifted score higher on intellectual *and* emotional OEs. These findings have been consistently found in the smaller previous studies (Hollingworth, 1942; Schultz & Delisle, 1997; Silverman, 1993) and are now replicated with a large sample using a self-rating questionnaire.

In conclusion, there are two major programmatic implications of these findings for the educational system overall and for gifted programs as a part of the educational system. Gifted programs should be sensitive to the finding that individuals identified as gifted also have a higher emotional OE than the nongifted. Although gifted programs select on the basis of intellectual ability, we have found that those selected also have stronger and richer emotions. As an additional programmatic implication, the school, as a pervasive agent of socialization, should be cognizant of the differential gender socialization that it fosters in males and females. The educational system needs to

be understanding of the finding that males have higher intellectual, imaginal, and psychomotor OEs than females and that females have higher emotional and sensual OEs than males. If the impact of gender-role socialization on development is to be lessened, educators must encourage the development and expression of each of the OEs in both males and females. In short, educational programs need to be sensitive to the developmental needs of males and females alike, and gifted programs need to be sensitive not only to the intellectual, but also to the emotional, needs of these students. ¶

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End Note

1. The OEQ II with manual is available from the Institute for the Study of Advanced Development, 1452 Marion St., Denver, CO 80218.

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