INDIVIDUAL, FAMILY, AND SCHOOL FACTORS ASSOCIATED WITH THE IDENTIFICATION OF FEMALE AND MALE STUDENTS FOR SPECIAL EDUCATION

Donald P. Oswald
Al M. Best
Virginia Commonwealth University
and
Martha J. Coutinho,
East Tennessee State University

The purpose of this study was to investigate factors related to placement in special education for males and females. The conceptual approach included individual, family, and school characteristics believed to influence educational performance and outcomes with emphasis was given to variables for with evidence of differential effects for males and females. Using the nationally representative, longitudinal NELS-88 data set, a logistic regression model examined the extent to which individual, family, and school characteristics were differentially associated (for male and female students) with identification for special education. The model identified a variety of characteristics associated with identification for special education, but only one individual characteristic, self-concept, for which the effect was different for male and female students. Recommendations for secondary education and transition practices and research were offered related to self-concept with respect to differences across gender, racial/ethnic, and disability status.

Placement in special education holds lifelong significance for a child. For children with disabilities not making satisfactory educational progress, IDEA (P.L. 105-17, as amended) provides for nondiscriminatory eligibility procedures and the opportunity for an individualized education. However, many now argue that special education identification for too many leads to a second-class education, and for other students, identification itself is unwarranted (Donovan & Cross, 2002). Related concerns about discrimination and bias continue to impact public opinion adversely about a service intended to assure a high quality education for individuals with disabilities (President's Commission on Excellence in Special Education (PCESE), 2002; Donovan & Cross, 2002).

Among the factors are known to influence placement in special education are significant developmental delays; achievement deficits, particularly in reading and math; and behavioral problems, poverty, and the disability definition (Coutinho, Oswald & Best, 2002; Del'Homme, Kasari, Forness, & Bagley, 1996; Fujiura & Yamaki, 2000; Halfon & Newcheck, 1999; MacMillan, Gresham, Lopez, & Bocian, 1996). Other variables associated with identification as disabled include race and gender (Oswald, Coutinho, Best, & Nagle, 2002). Racial and ethnic disproportionality in special education is now widely recognized, but controversy about the basis for the disproportionality complicates public efforts to provide students with disabilities with equity in their education experience (Donovan & Cross, 2002; Losen & Orfield, 2002).
Surprisingly, interest in gender disproportionality in special education is relatively recent (Gender differences impact learning and post-school success, 2003; U.S. Department of Education, 1998). This contrasts sharply with regular education where controversy has existed

since 1972, when females were found on the wrong side of the gender gap because of deficits in math, science, and the lower likelihood of placement in the college track (Lee, Chen, Smerdon, 1996). Substantial evidence now points to the emergence of gender differences in middle school favoring females in some instances (Willingham & Cole, 1997). However, attention is more often drawn to how educators may shortchange females (Lee, et al., 1996; Orenstein, 1994; Sommers, 2000).

For a long time, evidence has existed about the over representation of males in special education. The overall male to female ratio in special education has been reported between 2:1 and 3:1, although this varies depending on the disability condition (Bentzen, 1966; Hayden-McPeak, Gaskin, Gaughan, 1993; Mumpower, 1970; Oswald, et al., 2002; Valdes, Williamson, & Wagner, 1990). Longitudinal analyses of the nationally representative data base of school aged children collected by the U.S. Office for Civil Rights reveal that disproportionality is greatest for the category of Serious Emotional Disturbance (SED), where the proportion of males to females, since 1976, has been about 3.5:1. The variation in state male:female ratios is also greatest for students with SED, ranging up to nearly 6:1 (Coutinho & Oswald, in press).

The National Longitudinal Transition Study of secondary aged youth has also reported proportions of males and females identified for LD, MR, SED, and several other disability conditions (U.S. Department of Education, 1998; Valdes, et al., 1990). The proportions of males and females identified as LD and SED were comparable: 73% and 76%. The greater disproportionality for LD obtained by Valdes et al., (1990) as compared to Oswald et al., (2002), may reflect differences in the ages analyzed. Male students made up about 58% of students identified with mental retardation (MR), sixty percent (60%) of those identified as having speech impairments, and about 65% of students with multiple disabilities. Between 52-56% of those identified for a number of sensory and physical conditions, including hearing, orthopedic, deafness, other health impairments, and visual impairments were male. There was no gender disproportionality for the condition of deaf/blindness.

Males are identified at higher rates than females for almost all childhood psychiatric disorders. Male disproportionality is greatest for the conditions of attention deficit hyperactivity disorder (4-9:1), autism (4-5:1), and stuttering (3:1). More males than females are also identified for several other conditions, including mental retardation, reading disorder, language disorder, Asperger syndrome, oppositional defiant disorder, conduct disorder, Tourette's syndrome, encopresis, and enuresis. Females are more likely to be identified for the conditions of separation anxiety and selective mutism, and there are is no gender disproportionality for feeding disorders. Only females are diagnosed with Rett's disorder (American Psychiatric Association, 2000).

There is some concern that males are over referred for special education evaluation and inappropriately identified because of behaviors that are difficult to manage, but do not reflect a disability (Donovan & Cross, 2002; PCESE, 2002). However, the controversy about gender differences most often centers on gender disparities that affect females, particularly the equity and effectiveness of the special education process of referral, evaluation, and services (Hayden-McPeak et al., 1993; Wehmeyer & Schwartz, 2001a). At the point of identification, there is evidence that females are older, more severely disabled, demonstrate lower IQ scores, and after identification, are served in more restrictive placements (Gillespie & Fink, 1974; Gottlieb, 1987; Kratovil & Bailey, 1986; Mercer, 1973; Phipps, 1982; Wagner, et al., 1991; Wehmeyer & Schwartz, 2001b).

After exiting school, females with disabilities further lag behind males. Although females with disabilities do better while in school (higher rates of academic performance and school completion, fewer suspensions and expulsions), they are less likely to work, have less job stability, and earn lower wages than males (Doren & Benz, 1998; Doren & Benz, 2001; Harvey, 2003; Valdes et al., 1990; Wagner et al., 1991). Young adult females who were

served under IDEA are less likely to pursue postsecondary training (U.S. Department of Education, 1998).

Increasingly, the demand for a globally competitive workforce will be met by women, minorities, and individuals with disabilities (Bennett & McLaughlin, 1988; Mau, 1995). The relatively poor educational performance and outcomes of females, minorities, low achieving students, and those with disabilities is a major concern in that about 85% of the labor needed must be skilled or professional workers (Brustein &Mahler, 1994). Employers are not enthusiastic about the skills and preparedness of typically achieving youth and have even more reservations about the skills of women, minorities and those with disabilities (Bennett & McLaughlin, 1988; Secretary's Commission of Achieving Necessary Skills (SCANS), 1991). Information about gender differences in special education is needed to implement successful and differentiated secondary transition planning and activities.

Conceptual Framework
The purpose of this study was to investigate factors related to placement in special education for males and females. The NELS-88 data set includes a rich set of information about students, families, and schools. The conceptual framework for the selection of potential predictors was developed to investigate gender differences in education and to recommend how to improve educational effectiveness and equity (Lee, et al., 1996).

Three classes of characteristics are hypothesized to influence students' educational performance and outcomes: the individual, family, and school. Particular emphasis was given to variables for which there are indications in the literature of differential effects for male and female students. Individual characteristics include race/ethnicity, educational performance, school engagement, and psychological characteristics. Educational performance and other indicators differ across racial/ethnic groups, and in some studies, significant gender differences have been observed within racial/ethnic groups (Burbridge, 1991; Mau, 1995; Riordan, 1998; Riordan & Galipeau, 1998). Significant gender differences are reported for some educational performance variables, including grades, achievement, and academic background (Riordan, 1998; Riordan & Galipeau, 1998). Gender differences have been found for school engagement, which includes time spent doing homework, student aspirations, retention, and absenteeism (Lee, et al., 1996; Mau, 1995). Females still do more homework, and work less part-time, although the gap is narrowing (Riordan, 1998). Mau (1995) found Black male and White male students had significantly higher educational aspirations than Hispanic and Native American males. Differences in locus of control and self-concept may be important for understanding identification for special education. Males often attain modestly higher scores than females on global measures of self-concept (Feingold, 1994; Hanes, Prawatt, & Grissom, 1979; O'Brien et al., 1996; Quatman & Watson, 2001; Robinson-Awana et al., 2001).

Family characteristics include parent and household variables (e.g. socioeconomic status [SES]). SES variables in the NELS data set include father's education, mother's education, mother's occupation, and family income. SES is often observed to exert a main effect on education indicators (Capraro, Capraro, Wiggins, & Barrett, 2000; Peng & Lee, 1992), but in some studies SES also interacts with gender (Burbridge, 1991; Lee et al., 1996). Lee et al., (1996) found 8th grade males are slightly, but significantly, more advantaged than females on SES. Burbridge (1991) reported SES influenced educational outcomes more than any other factor, and described findings that differed by SES, gender, and race. Low SES males are more likely than low SES females to score below basic in math, whereas among high SES students, the scores of males exceed those of girls across all racial/ethnic groups. Several other household characteristics that are known to influence educational outcomes and performance are also included in the family characteristics component: single parent status, low parent education, sibling dropping out, being home alone three or more hours after school without supervision, and Limited English Proficiency (Pallas, Natriello, & McDill, 1989;

Peng & Lee, 1992; Ralph, 1989). The influence of parent involvement has been found to vary for students of different socioeconomic backgrounds and race/ethnicity, and there is some evidence for gender differences as well (Catsambis, 2000; Singh et al., 1995). Parent involvement as included in the present model is defined as the frequency with which a parent helps the student with homework.

School characteristics make up the third group of hypothesized predictors. Lee et al. (1996) described gender difference in the association between school climate measures and a variety of educational measures, and in some instances (e.g., social studies achievement), school characteristics that significantly influenced effectiveness were associated with gender inequity. Gender and racial differences in educational and vocational planning help-seeking behaviors have been reported. Mau (1995) observed that male students were more likely to ask a counselor about jobs or careers or for help in improving academic work, but females were more likely to ask a teacher, or friends and relatives when selecting courses or programs at school.

Method
Sample
The National Education Longitudinal Study (NELS) program was instituted by the National Center for Education Statistics with the aim of studying *the educational, vocational, and personal development of students at various grade levels, and the personal, familial, social, institutional, and cultural factors that may affect that development.* (NCES, 1994) The program began with a twelfth-grade cohort in the National Longitudinal Study of the High School Class of 1972 and was continued in the 1980s with the High School and Beyond with a cohort of tenth- and twelfth-graders. NELS-88, the data set analyzed below, involved a sample of students who were in the eighth grade in 1988. The study included a follow-up in 1990, a second follow-up in 1992, and a third follow-up in 1994. The variables included in the present study were all drawn from the initial (1988) round of data collection and selected variables were taken from each of the four Base Year components: student surveys and tests, parent surveys, school administrator surveys, and teacher surveys.

The Base Year sample was recruited using a two-stage stratified probability design to create a nationally representative sample of eighth grade schools and students. The first stage yielded 1,052 participating schools, 815 public schools and 237 private schools. The second sampling stage (student sampling) produces a random selection of 26,432 students from the participating schools, of whom 24,599 participated in the 1988 data collection. (NCES, 1994)

The NELS sample analyzed in the present study consisted of 23,926 subjects with usable data, including 11,890 males and 12,036 females. The race/ethnicity distribution of the sample was as follows: 1.2% American Indian (AI; n=286), 6.2% Asian/Pacific Islander (AS; n=1,486), 12.4% Black (BK; n=2,972), 12.8% Hispanic (HI; n=3,067), and 67.4% White (WH; n=16,115).

Subjects in the NELS sample were divided into four status groups: special education (SE), low achieving (Low), typically achieving (Typical), and gifted and talented (GT). SE students (n=3,575) were extracted from the pool first and were defined as those students whose parents answered affirmatively to the question: *Has your eighth grader ever received special services for any or all of the following? Visual handicap (not correctable by glasses)* [n=284], *Hearing problem* [n=434], *Deafness* [n=65], *Speech problem* [n=1,468], *Orthopedic problem (for example, club foot, absence of arm or leg, cerebral palsy, amputation, polio)* [n=247], *Other physical disability* [n=194], *Specific learning problem (for example, dyslexia or other reading, spelling, writing, or math disability)* [n=1,750], *Emotional problem* [n=759], *Other health problem* [n=596]. The total of special services received is greater than the total number of SE students because many students had received more than one type of special service. The SE sample includes 1,545 female students (43.2%) and 2,030 male students (56.8%).

Table 1
Distribution of Males and Females in Each Status Group

Group	N Female	Male	Percent Male	M:F Odds	Percent group Female	Male
Race: All						
SE	1545	2030	56.78	1.31	12.84	17.07 *
Low	2752	2995	52.11	1.09	22.86	25.19 *
Typical	6347	5693	47.28	0.90	52.73	47.88 *
GT	1392	1172	45.71	0.84	11.57	9.86 *
all	12036	11890	49.69	0.99	100.00	100.00
Race: WH						
SE	1169	1551	57.02	1.33	14.48	19.28 *
Low	1260	1510	54.51	1.20	15.61	18.77 *
Typical	4754	4208	46.95	0.89	58.90	52.31 *
GT	888	775	46.60	0.87	11.00	9.63 *
all	8071	8044	49.92	1.00	100.00	100.00
Race: BK						
SE	163	200	55.10	1.23	10.72	13.77
Low	673	662	49.59	0.98	44.28	45.59
Typical	501	456	47.65	0.91	32.96	31.40
GT	183	134	42.27	0.73	12.04	9.23
all	1520	1452	48.86	0.96	100.00	100.00
Race: HI						
SE	144	189	56.76	1.31	9.15	12.66 *
Low	627	584	48.22	0.93	39.83	39.12
Typical	638	618	49.20	0.97	40.53	41.39
GT	165	102	38.20	0.62	10.48	6.83 *
all	1574	1493	48.68	0.95	100.00	100.00
Race: AS						
SE	52	69	57.02	1.33	7.15	9.09
Low	129	172	57.14	1.33	17.74	22.66
Typical	399	362	47.57	0.91	54.88	47.69
GT	147	156	51.49	1.06	20.22	20.55
all	727	759	51.08	1.04	100.00	100.00
Race: AI[1]						
SE	17	21	55.26	1.24	11.81	14.79
Low	63	67	51.54	1.06	43.75	47.18
Typical	55	49	47.12	0.89	38.19	34.51
GT	9	5	35.71	0.56	6.25	3.52
all	144	142	49.65	0.99	100.00	100.00

* The 95%CI of the group percentage for females does not
overlap the 95%CI of the group percentage for males.
1) Because of small sample size, AI subjects are excluded
from the final analyses.

GT students were extracted next and were defined as subjects whose parents answered
affirmatively to the question: *Is your eighth grader currently enrolled in a gifted or talented
program?* Low achieving students were defined as those who, among the remaining subjects,
fell into the lowest quartile of standardized achievement testing scores for either reading or
math. Typical students comprised the remainder of the sample. The number of male and
female students in each of these groups is summarized in Table 1 (above).

Procedure
Including SEX and RACE, 24 variables were selected from the NELS-88 Base Year data set
to reflect the three components of the conceptual model: individual characteristics, family
characteristics, school characteristics. Each of these covariates is described briefly in Table 2
(below). In order to test the combined effects, all covariates were included in a multinomial

logistic regression predicting the probability of being in special education (or one of the other groups). Multinomial logistic regression models the odds of group membership compared to a reference group (defined as: Typical, White, Female), with all covariates at the median value. Because the covariates were expected to be related to one another, a stepwise logistic regression procedure was used first to determine which covariates remained significant when the effects of other variables were considered. The initial multinomial logistic regression included the following: a) SEX, RACE, and SEX*RACE were forced into the model, b) all nominal variables were included along with their interactions with the variables included in a), and c) all continuous variables were included as linear and quadratic effects along with their interactions with the variables included in a). Nonsignificant effects were removed from the initial model to yield a final logistic regression model.

The final model characterizes the relationship between the covariates and the probability of being in special education. The effects of primary interest for the present purpose are those interaction effects that include SEX. These effects identify those covariates that *work differently* for boys and girls and thus may serve to explain the basis of gender disproportionality in special education. If, for example, the GRADES by SEX interaction were significant, the inference might be that, while GRADES are related to the probability of being in special education for both boys and girls, the nature or extent of that relationship varies depending on the student's SEX.

Table 2. Summary of Covariates

	Group								
	SE			**other**					
Characteristics	**N**	**Mean**	**Std**	**N**	**Mean**	**Std**	**Min**	**Max**	**Median**
School									
Percent minority in school-midpoint (MINORITY)									
Males	1962	21.462	26.390	9485	27.434	30.140	0	95	15
Females	1498	23.312	27.340	10142	27.400	30.160	0	95	15
Percent of students in special ed. (SPED)									
Males	1975	6.344	5.298	9580	5.886	5.159	0	38	6
Females	1496	6.550	5.110	10188	5.990	5.205	0	38	6
Percent of students in gifted, talented ed. (GT)									
Males	1929	5.965	7.596	9263	6.071	8.181	0	73	4
Females	1476	5.747	7.211	9916	5.825	7.940	0	73	3
Family									
Socio-Economic Status composite (SES)									
Males	2008	-0.075	0.795	9734	-0.026	0.799	-2.97	2.56	-0.03
Females	1528	-0.164	0.788	10363	-0.073	0.811	-2.97	2.30	-0.08
Number of risk factors for dropping out of school (RISK)									
Males	2009	0.805	0.992	9739	0.668	0.932	0	5	0
Females	1528	0.862	1.041	10364	0.702	0.970	0	6	0
How often parent talks to child about school experiences (EXPERIENCES:1=not;4=regularly)									
Males	1981	3.777	0.509	8677	3.762	0.504	1	4	4
Females	1504	3.735	0.555	9325	3.744	0.537	1	4	4
How often parent helps child with homework (HWKHELP:1=seldom;4=daily)									
Males	1966	2.426	1.030	8635	2.188	0.999	1	4	2
Females	1501	2.382	1.001	9254	2.188	0.969	1	4	2
No one is home when child returns from school (ATHOME:1=usually,4=never)									
Males	1879	3.085	0.959	8162	3.082	0.981	1	4	3
Females	1408	3.065	0.975	8781	3.090	0.983	1	4	3

Table 2 Cont'd

| | | Group | | | | | | | |
| | | SE | | | Other | | | | |
Characteristics	N	Mean	Std	N	Mean	Std	Min	Max	Median
Community									
Percent minority in school-midpoint (MINORITY)									
Males	1962	21.462	26.390	9485	27.434	30.140	0	95	15
Females	1498	23.312	27.340	10142	27.400	30.160	0	95	15
Percent of students in special ed. (SPED)									
Males	1975	6.344	5.298	9580	5.886	5.159	0	38	6
Females	1496	6.550	5.110	10188	5.990	5.205	0	38	6
Percent of students in gifted, talented ed. (GT)									
Males	1929	5.965	7.596	9263	6.071	8.181	0	73	4
Females	1476	5.747	7.211	9916	5.825	7.940	0	73	3
Family									
Socio-Economic Status composite (SES)									
Males	2008	-0.075	0.795	9734	-0.026	0.799	-2.97	2.56	-0.03
Females	1528	-0.164	0.788	10363	-0.073	0.811	-2.97	2.30	-0.08
Number of risk factors for dropping out of school (RISK)									
Males	2009	0.805	0.992	9739	0.668	0.932	0	5	0
Females	1528	0.862	1.041	10364	0.702	0.970	0	6	0
How often parent talks to child about school experiences (EXPERIENCES:1=not;4=regularly)									
Males	1981	3.777	0.509	8677	3.762	0.504	1	4	4
Females	1504	3.735	0.555	9325	3.744	0.537	1	4	4
How often parent helps child with homework (HWKHELP:1=seldom;4=daily)									
Males	1966	2.426	1.030	8635	2.188	0.999	1	4	2
Females	1501	2.382	1.001	9254	2.188	0.969	1	4	2
No one is home when child returns from school (ATHOME:1=usually,4=never)									
Males	1879	3.085	0.959	8162	3.082	0.981	1	4	3
Females	1408	3.065	0.975	8781	3.090	0.983	1	4	3

| | | Group | | | | | | | |
| | | SE | | | Other | | | | |
Characteristics	N	Mean	Std	N	Mean	Std	Min	Max	Median
Individual									
Grades composite (GRADES:F=0.5;A=4)									
Males	1973	2.545	0.763	9620	2.911	0.755	0.5	4	3
Females	1500	2.683	0.751	10276	3.035	0.713	0.5	4	3
Standardized test composite (reading, math) (TESTCOMP)									
Males	1945	46.791	9.565	9438	51.203	10.370	30.71	75.81	49.18
Females	1480	47.086	9.734	10066	51.695	10.040	31.02	75.81	50.02
Locus of control t-score (LOCUSCONTROL)									
Males	1981	-0.092	0.650	9658	0.049	0.604	-3.01	1.52	0.03
Females	1521	-0.174	0.639	10324	0.017	0.615	-2.77	1.52	0.02
Self concept t-score (SELFCONCEPT)									

Results

The top portion of Table 1, which ignores race and all other student characteristics besides gender, shows clear evidence of gender disproportionality (chi-square = 130, df = 3, p < .0001), i.e., the 17% male identification rate for SE is different from the 13% female identification. However, the extent of male over representation in the SE group varies across the five race groups (chi-square = 25, df = 9, p =0.0029). Among AS SE students, 57% are male; again a rate only marginally different than the 51% expected (OR=1.46, p-value = 0.0542). Among BK students, 55% are male, a rate significantly higher than the 49% expected (OR=1.34, p-value = 0.0158).Among HI students, 57% are male, a rate significantly higher than the 49% expected (OR=1.35, p-value = 0.0144), Finally among WH students, 57% are male, a rate clearly above the 50% expected (OR=1.50, p-value < .0001). So, although there is evidence of gender disproportionality overall, the effect does not appear to be constant among the race groups. Because of the small number of AI students in the sample, they were excluded from all subsequent analyses. Because gender disproportionality may be associated with any of the covariates in Table 2, the covariates, sex, and race were all entered as predictors in the logistic regression model.

Initial Model

After the nonsignificant effects were removed from the initial logistic regression the number of the variables in the model was reduced to fifteen. Several covariates were dropped from

subsequent analyses because they yielded no effect in the prediction of status group. Although significant when considered separately, the following covariates were not significant when the fifteen others were taken into account: RURALITY, EXPERIENCES, ATHOME, WORK, DISRUPTIVE, and CAREER. Thus, of the initial group of covariates included in the conceptual model, the variables in the final model are those that display a unique contribution to the prediction of group, when considered simultaneously with all other covariates.

Final Model
The final model included SEX; RACE; the fifteen covariates described above; quadratic effects for some of the continuous covariates; and interactions with SEX, RACE, and SEX-by-RACE. The final model yielded 27 significant effects though not all were significant with regard to distinguishing SE students from other students. The remainder of the paper focuses on interpretation of the SE results.

The results of the final model indicate that, when the effects of significant covariates are taken into account, gender disproportionality remains significant ($p<.0001$). Although there are race differences in gender disproportionality, these effects are taken into account but are not the primary focus of our results. The presence of interactions in the model require the cautious interpretation of effects.

Bivariate Relationships
It is instructive to consider the bivariate relationship between each of the covariates in the final model and the probability of being in special education. Because the effect was similar for all four RACE groups for all of the twelve covariates in Figure 1, the RACE groups are combined. In the first panel of Figure 1, the probability of being in special education is shown to decrease as the percentage of minority students in the school increases. Two other covariates, GRADES and LOCUSCONTROL, were also inversely associated with the probability of special education, i.e., a higher grade-point average and more internal locus of control were associated with a decreased probability of special education. Four covariates were directly associated with probability of special education; higher SES, more risk factors, having been retained, and being frequently absent are associated with increased probability of special education. The other five covariates in Figure 1 were significantly related to the other group membership not reported in this paper (low, typical, or GT) but not with special education.

 For each of the above covariates, the relationship to special education status was consistent across the four race groups. However, for two covariates the relationship depended upon race. Among WH students, whether or not teachers talked with them about courses was unrelated to the probability of being in special education. However, for BK students, talking about courses in school was associated with a decrease in SE proportion while, for the other two race groups, talking about courses in school was associated with an increased probability of special education.
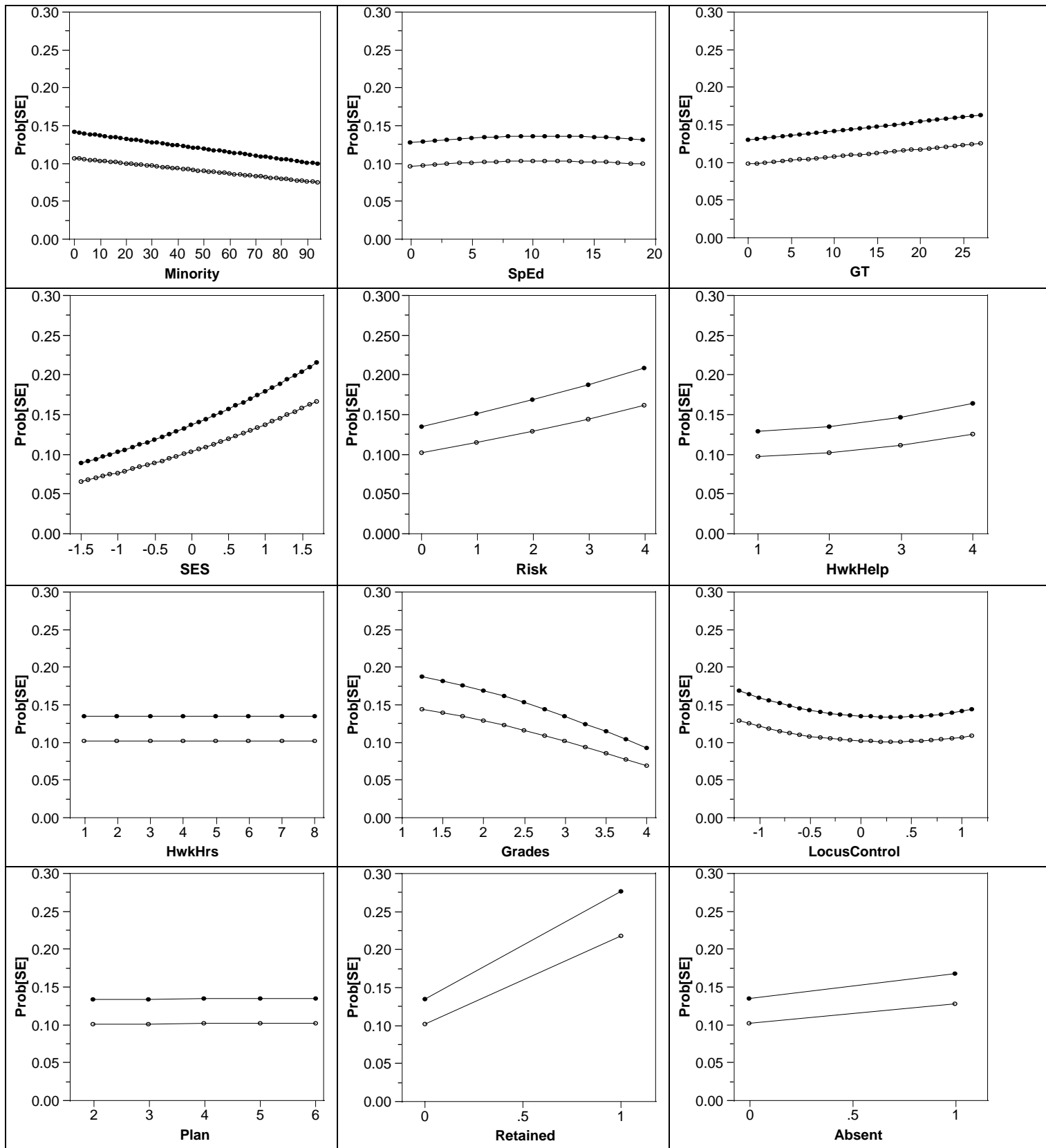
Figure 1. Final model: Bivariate relationships for covariates
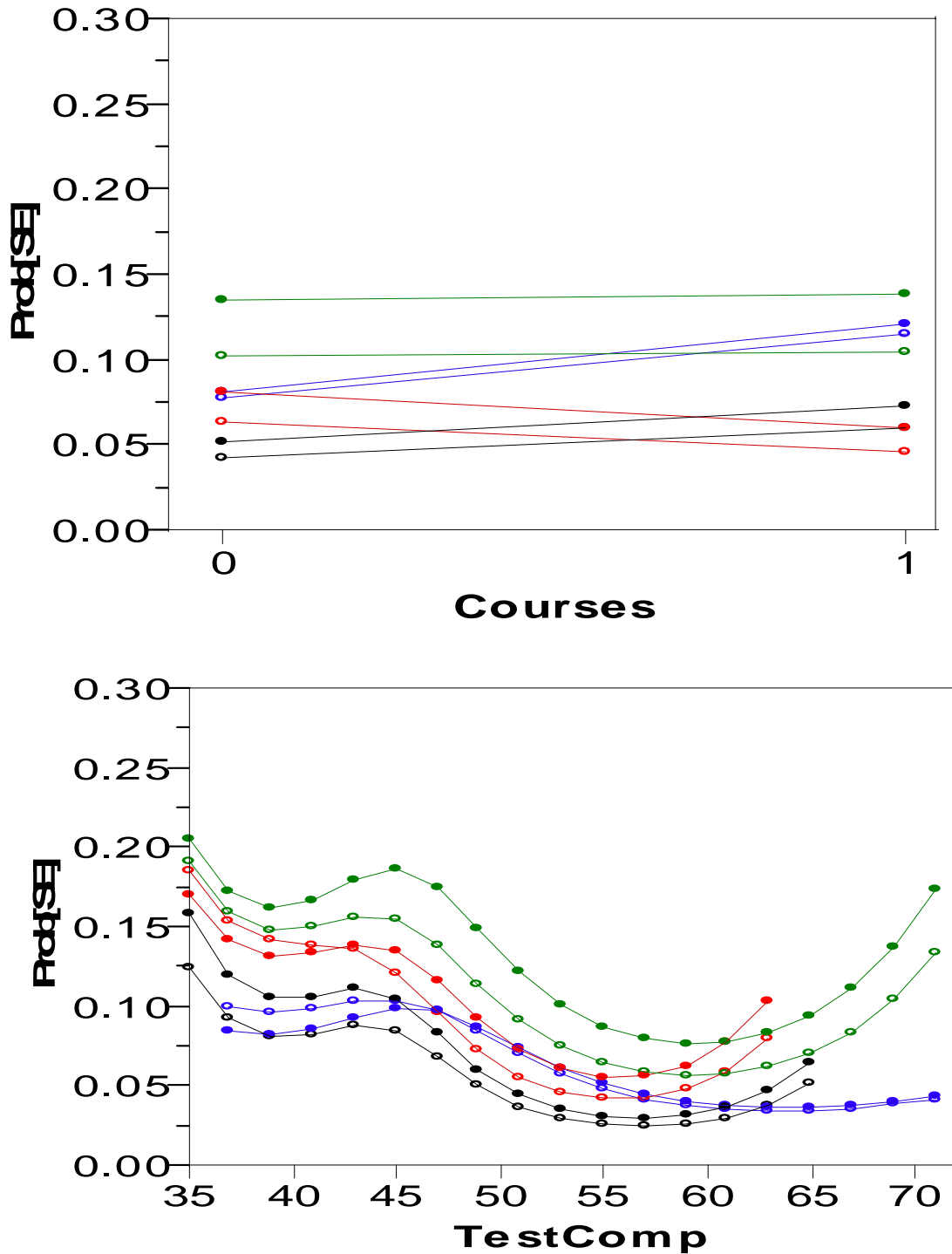**Legend: Males = filled circles, Females = empty circles**

Figure 2. Final model: Bivariate relationships for covariates that vary by race
Legend: Males = filled circles, Females = empty circles; Green = white students, Red = black students,
Black = Hispanic students, Blue = Asian students.

As seen in the second panel of Figure 2, the relationship with reading and math standardized
test composite is more complex. There is a general overall trend for lower test scores to be
related to higher probability of SE identification. While the interaction involving RACE was
significant, interpretation of the relatively minor differences among RACE groups is unlikely
to be fruitful. There is an apparent trend toward higher probability of SE identification among
student with test composite scores greater than 60.

In the final model, only a single covariate *worked differently* for male and female students in the prediction of group (i.e., yielded a significant interaction involving SEX) and that covariate was CONCEPT. The implication of this result is that while there are many other main effects in the model (i.e., covariates that are associated with the likelihood of being identified as a student in special education), those effects are statistically identical for male and female students. The exception is that boys and girls differ with regard to the manner in which student self-concept is associated with identification for special education.

The nature of the interaction between CONCEPT and SEX in predicting the probability of special education status is illustrated in Figure 3. For each RACE group, the solid circles represent the predicted probability of special education status (Y axis) across the distribution of CONCEPT values (X-axis) for male students while the open circles represent that probability for female students. Thus, as Figure 3 illustrates, the relationship between self-concept and the probability of being in special education for both male and female White students is inverse and linear; students with more positive self-concepts have a lower probability of being in special education than do students with a more negative self concept. The relationship for Black students is also generally inverse but is not linear and differs for male and females students such that, among Black students with the most negative self-concept, males are markedly more likely to be in special education (probability = about .35) than are females (probability = about .13).
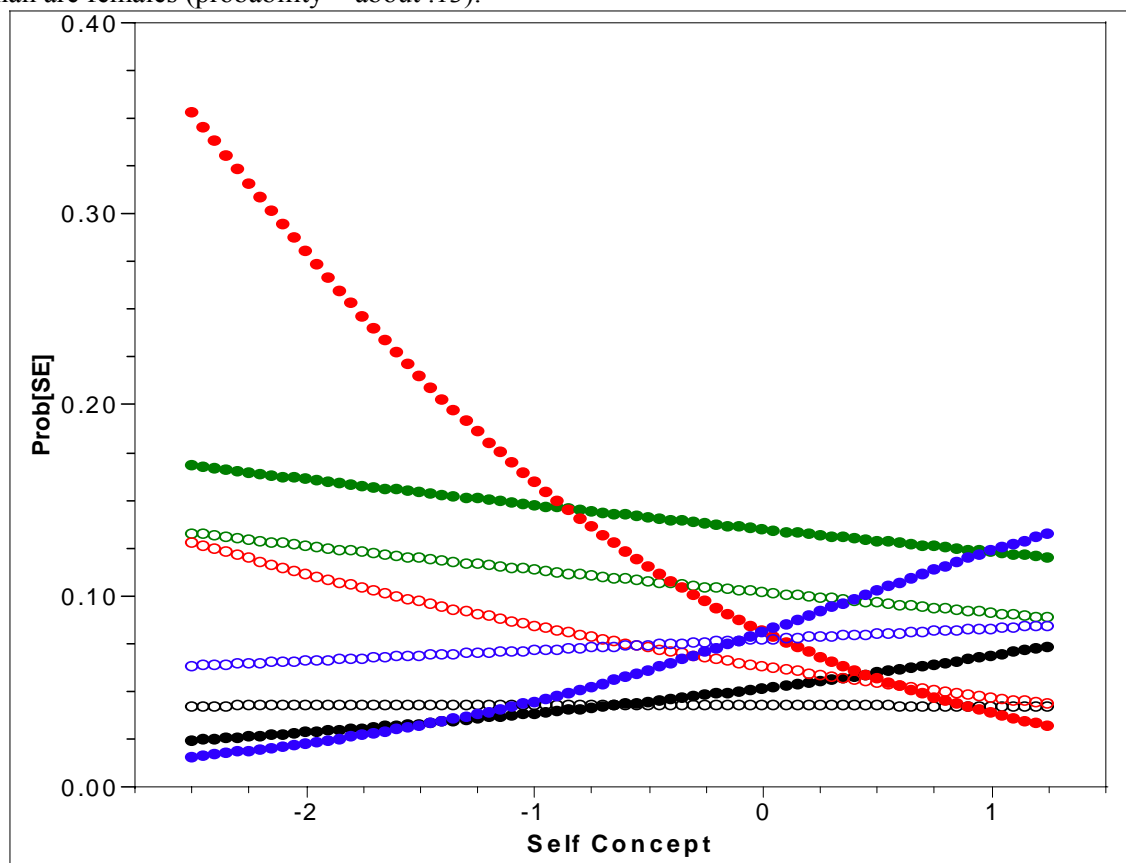

Figure 3. Final model: Adjusted relationship between self-concept and student group
Legend: Males = filled circles, Females = empty circles; Green = white students, Red = black students, Black = Hispanic students, Blue = Asian students.

For Asian and for Hispanic students the relationship is even more complex. Among Hispanic female students, the relationship is virtually nil; the line is horizontal, indicating that the probability of being is special education is the same at all levels of self-concept. For Hispanic male students and for Asian female students, however, there is a modest, direct relationship; those with more positive self-concept tend to have a higher probability of being in special education than those with more negative self-concept. This pattern is exaggerated among

Asian male students; more positive self-concept is associated with a substantially higher probability of being in special education, compared to more negative self-concept.

In an effort to further explore the relationship between self-concept and special education, the sample was divided into tertiles in which the one-third of the sample with the lowest (i.e., most negative) CONCEPT is designated the first tertile and the one-third of the sample with the highest CONCEPT is designated the third tertile. The probability of being in special education was computed for each RACE by SEX group within each tertile. This calculation answers questions like the following example: What is the probability of being in special education for Black, male students with low self-concept? (see Table 3)

Table 3.
Self-concept tertiles

SELF CONCEPT Tertile	Proportion in SE Males	Females	Relative Risk	p-value	
Lowest	0.054	0.074	0.734	0.3505	0.1226
Mid	0.081	0.078	1.046	0.7364	
Highest	0.113	0.082	1.377	0.1585	
Lowest	0.134	0.078	1.709	0.0646	0.1245
Mid	0.082	0.064	1.292	0.1473	
Highest	0.049	0.052	0.944	0.8399	
Lowest	0.042	0.043	0.975	0.8075	0.2353
Mid	0.052	0.043	1.205	0.3548	
Highest	0.064	0.043	1.491	0.1314	
Lowest	0.144	0.111	1.304	0.0001	0.9673
Mid	0.135	0.102	1.321	<.0001	
Highest	0.127	0.095	1.340	0.0003	

Included in Table 3 is a relative risk (RR) ratio for male and female students in each RACE-by-CONCEPT tertile group, providing a single metric for characterizing male disproportionality. As is clear in Table 3, gender disproportionality is approximately equal for White student across the CONCEPT tertiles; males are about 1.3 times as likely as females to be in special education regardless of self-concept. For Asian and Hispanic students, male overrepresentation increases as self-concept increases; that is, for these two RACE groups, males in the highest CONCEPT tertile are substantially more likely than females to be in special education (RR = 1.39 and 1.5, for Asian and Hispanic students respectively), while, in the lowest tertile gender disproportionality disappears for Hispanic students (RR = 1.00) and males are underrepresented among Asian students (RR = .78). For Black students, the pattern is reversed. Among Black students with the lowest CONCEPT, males are 1.67 times as likely as females to be in special education, and there is virtually no gender disproportionality among Black students with the highest CONCEPT (RR = .96).

Discussion
Based on the results of this study, differences between males and females in self-concept may be important for understanding identification for special education. Positive self concept formation is regarded as a significant milestone of adolescence (Richman, Clark, & Brown, 1985), and low self concept has been long seen as a correlate or antecedent for many emotional or behavioral disorders later in life, including anxiety, depression, and conduct disorders (Harter, 1990; Quatman & Watson, 2001). With respect to students with disabilities,

lower self-concept has been reported for students with LD, even after controlling for gender, ethnicity, age, achievement, placement, and age at which the disability was established (Heyman, 1990).

The results of this study are consistent with those of other studies that found males attain modestly higher scores on global and sub-component measures of self-concept, and these differences persist into adult life (Feingold, 1994; Hanes, et al., 1979; O'Brien, et al., 1996, Quatman & Watson, 2001; Robison –Awana, et al., 1986). Quatman & Watson (2001) observed a difference .22 standard deviation unit difference favoring males for global self, and scores equal or higher than females for several sub-components of self-concept. Despite the small differences favoring males, similar subcomponents have been found to predict global self-concept in males and females (Quatman & Watson, 2001). Results from a twin study indicated similar genetic factors influence self-concept in both males and females (Kendler, Gardner, & Prescott, 1998) and about 30% of the variance in self concept was attributable to genetic factors, whereas only about 4% was related to gender.

In the present study, Black students with low self-concept were at substantially higher risk of special education placement but the direction of the relationship cannot be determined. Some students, particularly black males, may demonstrate low self-concept early on. which puts them at higher risk of placement in special education. Conversely, the special education experience may contribute negatively to self-concept. Student perception of self-concept in NELS was measured in 8th grade, years after most of the students were most likely identified. Though evidence indicates that self-concept is relatively stable (Quatman & Watson, 2001), the impact of the special education experience on self-concept is unknown.

Gender by race interactions related to self-concept have been reported frequently (Dooley & Prause, 1997; Martinez & Dukes, 1991; Wade, Thompson, Tashakkori, & Valente, 1989). Richman et al., (1985) reported that White females have lower a self-concept than other race/gender groups. Self-concept, gender differences and SES relationships have also been reported. Richman et al., (1985) observed that generally the self-concept of students from low SES was lower than that for high SES students, but high SES white students were lower on self-concept measures than black students and white middle class students.

Many studies find black students report higher global self-concept than white students (Richman et al., 1985; Dukes & Martinez, 1997; Tashakkori, 1993). However, school related subcomponents of self-concept may follow a different pattern. Hare (1985) observed that black self-beliefs in school related areas were lower than white students. This was consistent with findings obtained by Richman et al., (1985) who found white females less confident about their school ability than white males and black females, but black males were the least confident. Richmond hypothesized that school and academic achievement may be of secondary importance to black students, whereas the ability to assume adult life roles as early as possible or *street wisdom* may be more important in the development of self-concept (Richman et al., 1985). The self-concept measured in a school context may be highly influenced by perceptions about academic competence. If true, the higher probability of placement in special education obtained for black males in this study may relate to a perception that success in school is of relatively lower importance in the formation of beliefs about self for male students who are black.

Limitations
Generalization of these findings is limited by the fact that the sample of students in special education is unlikely to include adequate representation of students with moderate to severe disabilities. The sample is limited to students able to participate in the self-report survey for more severely impaired students are not included. In addition, the special education is defined by parent report rather than a school record review and it is possible that a small number of students are misclassified based on faulty parent report.

Self-concept, in general, has been difficult to describe and interpret for students with disabilities (Gresham, Lane, & MacMillan, 1999). Many studies report students with learning disabilities and emotional and behavioral difficulties (internalizing or externalizing) demonstrate low self-esteem (Barkley, 1990; Callahan, Panichelli-Mindel, & Kendall, 1996; Heyman; 1990; Hinshaw, 1987; Patterson, 1986). Other studies have found that some students with behavioral, learning, or attentional difficulties report unrealistically high or inflated views of themselves (Bear & Minke, 1996; Diener & Milich, 1997; Gresham, MacMillan, Bocian, Ward, & Forness, 1998). In a recent study, students with behavioral difficulties, appeared to have adequate self concepts despite poorer peer acceptance, greater loneliness, poorer school adjustment, and several other significant difficulties (Gresham et al., 1998)

Recommendations for Secondary Education and Transition Practice and Research
Based on the findings in this study, schools' investment in the psychological well being of males and females may be important for several reasons. Gender differences in self-concept have lasting effects. High school aged males with average or above average self-concept were substantially less likely to be unemployed after school, whereas the risk only slightly decreased for females (Dooley & Prause, 1997). The magnitude of the effect for self-concept was comparable to that of aptitude or that obtained by graduating from high school. As students move from elementary through secondary grades, we suggest teachers implement transition planning activities that recognize the potential role self-concept may have on the achievement, aspirations, and outcomes of females and Black males, in particular. We also recommend teachers conduct self-evaluations of teacher-student interactions to examine how teacher beliefs may differentially influence self-concept formation or who is referred for special education.

Research is recommended to investigate the higher probability of placement in special education obtained for black males in this study and whether this finding relates to a perception that success in school is of relatively lower importance in the formation of beliefs about self for male students who are black. Research among nondisabled students has pointed to an apparent need for different strategies to improve self concept across racial and ethnic groups (Tashakkori, 1993). Comparable research is needed among students with disabilities. Findings obtained in this study indicate differences between males and females in self concept across racial/ethnic groups may be important if teachers are to accurately refer, identify, and serve students with disabilities.

Finally, the efficacy of interventions to improve self-concept should be investigated. Disability, gender, and race/ethnicity must be considered explicitly in the design of research and intervention strategies. Student outcome variables are needed that reflect recent public policy related to improved literacy and preparedness for adult life.

References
American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (Fourth edition, Text Revision). Washington, DC: Author.
Barkley, R. (Ed). (1990). *Attention deficit hyperactivity disorder: A handbook for diagnosis and treatment.* New York: Guilford.
Bear, G., & Minke, K. (1996). Positive bias in maintenance of self-worth among children with LD. *Learning Disability Quarterly, 19,* 22-32.
Bentzen, F. (1966). Sex ratios in learning and behavior disorders. *The National Elementary Principal, 46,* 13-17.
Bennett, W. J., & McLauglin, A. (1988). *The bottom line: Basic skills in the workplace.* Washington, DC: US Department of Labor and US Department of Education.
Burbridge, L. C. (1991). The interaction of race, gender, and socioeconomic status in education outcomes. Paper presented at the meeting of the American Sociological Association, Cincinnati, Ohio.

Brustein, M., & Mahler, M. (1994). *AVA Guide to the School-to-Work Opportunities Act*. Washington, DC: American Vocational.

Callahan, S., Panichellil-Mindel, S., & Kendall, P. (1996). DSM-IV and internalizing disorders: Modifications, limitations, and utility. *School Psychology Review, 25,* 297-307.

Capraro, M.S., Capraro, R. M., Wiggins, & Barrett, B. (2000). An investigation of the effects of gender, socioeconomic status, race and grades on standardized test scores. Paper presented at the meeting of the Southwest Educational Research Association, Dallas, Texas.

Catsambis, S. (2000). *Expanding the knowledge of parental involvement in secondary education: Effects on high school academic success. Report No. 27*. Baltimore, MD: National Institute on the Education of At-Risk Students (ED/OERI).

Coutinho, M. J., Oswald, D. P., & Best, A. L. (2002). The influence of sociodemo-graphics and gender on the disproportionate identification of minority students as having learning disabilities. *Remedial and Special Education, 23*, 49-59.

Coutinho, M.J., Oswald, D.P., Best, A.M., & Forness, S.R. (2002). Gender and socio-demographic factors and the disproportionate identification of minority students as emotionally disturbed. *Behavioral Disorders, 27*, 109-125.

Coutinho, M.J., & Oswald, D.P. (in press). State variation in gender disproportionality: Findings and recommendations. Remedial and Special Education.

Del'Homme, M., Kasari, C., Forness, S. R., & Bagley, R. (1996). Prereferral intervention and students at-risk for emotional or behavioral disorders. Educational and treatment of children, 19, 272-285.

Diener, M., & Milich, R. (1997). Effects of positive feedback on the social interactions of boys with attention deficit hyperactivity disorder: A test of the self-protective hypothesis. Journal of Clinical Child Psychology, 26, 256-265.

Donovan, M. S., & Cross, C. T. (Eds.). (2002). Minority students in special education. Committee on Minority Representation in Special Education. Washington, DC: National Academy Press.

Dooley, D., & Prause, J. (1997). Effect of students' self-esteem on later employment status: interactions of self-esteem with gender and race. Applied Psychology: An International Review, 46, 175-198.

Doren, B., & Benz, M. (1998). Employment inequality revisited: Predictors of better employment outcomes for young women with disabilities in transition. The Journal of Special Education, 31, 400-405.

Doren, B., & Benz, M. (2001). Gender equity issues in the vocational and transition services and employment outcomes experienced by young women with disabilities. In H. Rousso & M. L. Wehmeyer (Eds.), Double jeopardy: Addressing gender equity in special education (pp. 289-312). Albany, NY: SUNY.

Dukes, R., L., & Martinez, R. O. (1997). The effects of ethnic identify, ethnicity, and gender on adolescent well-being. Journal of Youth and Adolescence, 26, 503-17.

Feingold, A. (1994). Gender differences in personality: A meta-analysis. Psychological Bulletin, 116, 429-456.

Fujiura, G. T., & Yamaki, K. (2000). Trends in demography of childhood poverty and disability. Exceptional Children, 66, 187-199.

Gender differences impact learning and post-school success. (2003). CEC Today, 10, 1,4,7, 9 15.

Gillespie, P. H., & Fink, A. H. (1974). The influence of sexism on the education of handicapped children. Exceptional Children, 41, 155-162.

Gottlieb, B.W. (1987). Gender differences in cognitive profiles among urban children placed in special education. (ERIC Document Reproduction Service No. ED 387 972.)

Gresham, F.M., Lane, K.L., & MacMillan, D.L. (1999). Social and academic profiles of externalizing and internalizing groups: Risk factors for emotional and behavioral disorders. Behavioral Disorders, 24, 231-245.

Gresham, F.M., MacMillan, D.L., Bocian, K., Ward, S., & Forness, S. (1998). Comorbidity of hyperactivity-impulsivity-inattention - conduct problems: Risk factors in social, affective, and academic domains. Journal of Abnormal Child Psychology, 26, 393-406.

Halfon, N., & Newacheck, P. W. (1999). Prevalence and impact of parent-reported disabling mental health conditions among U. S. children. Journal of American Academy of Child Adolescent Psychiatry, 38, 600-609.

Hanes, B., Prawatt, R., & Grissom, S. (1979). Sex-role perceptions during adolescence. Journal of Educational Psychology, 71, 850-855.

Hare, B. R., (1985). Stability and change in self-perception and achievement among black adolescents: A longitudinal study. The Journal of Black Psychology, 11, 29-42.

Harter, S. (1990). Self and identity development. In S.S. Feldman & G. R. Elliott (Eds.), At the threshold: The developing adolescent (pp. 352-387). Cambridge, MA: Harvard University Press.

Harvey, M.W. (2003). Comparison of postsecondary transitional outcomes between students with and without disabilities by secondary vocational education participation: Findings form the National Education Longitudinal Study. Career Development for Exceptional Individuals, 25, 99-122.

Hayden-McPeak, C., Gaskin, S. T., & Gaughan, L. K. (1993, April). Bad boys, good girls: A review of the research on gender differences of assessment, child rearing, and educational practices. Paper presented at the Annual Convention of the Council for Exceptional Children, San Antonio, TX.

Heyman, W. B. (1990). The self-perception of a learning disability and its relationship to academic self-concept and self-esteem. Journal of Learning Disabilities, 23, 470-475.

Hinshaw, S. (1987). On the distinction between attention deficit/hyperactivity and conduct problems/aggression in child psychopathology. Psychological Bulletin, 101, 43-463.

Kendler, K.S., Gardner, C. O. & Prescott, C. A. (1998). A population-based twin study of self-esteem and gender. Psychological Medicine, 28, 1403-1409.

Kratovil, J., & Bailey, S. M. (1986). Sex equity and disabled students. Theory into Practice, 25, 250-256.

Lee, V. E., Chen, X., & Smerdon, B. A. (1996). The influence of school climate on gender differences in the achievement and engagement of young adolescents. Washington, D.C.: American Association of University of Women.

Losen, D. J., & Orfield, G. (Eds.) (2002). Racial inequity in special education. Cambridge, MA: Harvard Education Press.

MacMillan, D. L., Gresham, F. M., Lopez, M. F., & Bocian, K. M. (1996). Comparison of students nominated for prereferral interventions by ethnicity and gender. The Journal of Special Education, 30, 133-151.

Martinez, R., & Dukes, R. (199l). Ethnic and gender differences in self-esteem. Youth and Society, 22, 318-338.

Mau, W. C. (1995). Educational planning and academic achievement of middle school students: A racial and cultural comparison. Journal of Counseling and Development, 73, 518-526.

Mercer, J. (1973). Labeling the mentally retarded. Berkeley: University of California Press.

Mumpower, D. L. (1970). Sex ratios found in various types of referred exceptional children. Exceptional Children, 36, 621-622.

National Center for Education Statistics [NCES]. (1994). National Education Longitudinal Study of 1988 Second Follow-up: Student Component Data File User's Manual. Washington, D.C: U.S. Department of Education.

O'Brien, E. J., Leitzel., J., Mensky, L., Jeffreys, D., O'Brien, J.P. & Marchese, M. (1996). Gender differences in the self-esteem of adolescents: A meta analysis. Paper presented at American Psychological Corporation, Toronto, Canada.

Orenstein, P. (1994). School Girls: Young women, self-esteem, and the confidence gap. New York: Doubleday.

Oswald, D.P., Coutinho, M.J., Best, A, & Nagle, H. (2002). Trends in the special education identification rates of boys and girls: A call for research and change. Exceptionality, 11, 223-237.

Pallas, A., Natriello, G., & McDill, E. (June-July 1989). The changing nature of the disadvantaged population: Current dimensions and future trends. Educational Researcher, 18 , 16-22.

Patterson, G.R. (1986). Performance models for antisocial boys. American Psychologist, 41, 432-444.

Peng, S. S., & Lee, R. M. (1992, April). Measuring student at-riskness by demographic characteristics. Paper presented at the meeting of the American Educational Research Association, San Francisco, CA.

Phipps, P. M. (1982). The LD learner is often a boy – Why? Academic Therapy, 17, 425-430.

President's Commission on Excellence in Special Education [PCESE]. (2002). A new era: Revitalizing special education for children and their families. Washington, DC: PCESE.

Quatman, T., & Watson, C. M. (2001). Gender differences in adolescent self-esteem: An exploration of domains. The Journal of Genetic Psychology, 162, 93-117.

Ralph, J. (January 1989). Improving education for the disadvantaged: Do you know whom to help? Phi Delta Kappan,71, 395-401.

Richman, C. L., Clark, M. L., & Brown, K. P. (1985). General and specific self-esteem in late adolescent students: Race x gender x SES effects. Adolescence, 20, 554-566.

Riordan, C. (1998). Gender gap trends in public secondary schools: 1972 to 1992. Revised version of a paper presented at the Annual Meeting of the American Sociological Association (San Francisco, CA, August 1998). (ERIC Document Reproduction Service No. ED 434 171).

Riordan, C., & Galipeau, K. (1998). Achievement and equity in Catholic and public secondary schools: Gender gap comparisons from 1972 to 1992. Revised version of a paper presented at the Institute of Educational Initiatives (South Bend, IN, November 14, 1998). (ERIC Document Reproduction Service No. ED 434 964.)

Robison-Awana, P., Kehle, T. J., Bray, M. A., Jenson, W. R., Clark, E., & Lawless, K. A. (2001). Self-esteem, gender-role perception, gender-role orientation and attributional style as a function of academic competence: Smart girls are different, but a boy is a boy is a boy. Canadian Journal of School Psychology, 17, 47-64.

Robison-Awana, P., Kehle, T. J., & Jenson, W. R. (1986). But what about smart girls? Adolescent self-esteem and sex role perceptions as a function of academic achievement. Journal of Educational Psychology, 11, 854-856.

Secretary's Commission of Achieving Necessary Skills [SCANS]. (1991). What work requires of schools. A SCANS report for America 2000. Washington, DC: U.S. Department of Labor.

Singh, K., Bickley, P., Trivett, P., Keith, T. Z., Keith, P. B., & Anderson, E. (1995). The effects of four component of parental involvement on eighth-grade student achievement: Structural analysis of NELS-88 Data. School Psychology Review, 24(2), 299-317.

Sommers, C. H. (2000). The war against boys: How misguided feminism is harming our young men. New York: Simon & Schuster.

Tashakkori, A. (1993). Gender, ethnicity, and the structure of self-esteem: An attitude. The Journal of Social Psychology, 133, 479-489.

U.S. Department of Commerce. (1999). 21st century skills for 21st century jobs. Washington, D.C.: U.S. Government Printing Office.

U.S. Department of Education. (1998). Twentieth annual report to Congress. Washington, D.C.: Author.

Valdes, K., Williamson, B., & Wagner, M. (1990). The national longitudinal transition study of special education students: Statistical almanac (Vol. 1). Menlo Park, CA: SRI International.

Wade, T., Thompson, V., Tashakkori, A., & Valente, E. (1989). A longitudinal analysis of sex by race differences in predictors of adolescent self-esteem. Personality and Individual Differences, 10, 717-729.

Wagner, M., Newman, L., D'Amico, R., Jay, E. D., Butler-Nalin, P., Marder, C. & Cox, R. (1991). Youth with disabilities: How are they doing? The first comprehensive report from the national longitudinal transition study of special education students. Menlo Park, CA: SRI International.

Wehmeyer, M.L., & Schwartz, M. (2001a). Gender equity issues in the vocational and transition services and employment outcomes experienced by young women with disabilities. In H. Rousso & M. L. Wehmeyer, (Eds.), Double jeopardy: Addressing gender equity in special education (pp. 289-312). Albany, NY: SUNY.

Wehmeyer, M. L., & Schwartz, M. (2001b). Disproportionate representation of males in special education services: Biology, behavior or bias? Education and treatment of children, 24, 28-45.

Willingham W.W., & Cole, N.S. (1997). Gender and fair assessment. Mahwah, NJ: Lawrence Erlbaum Associates, Inc.