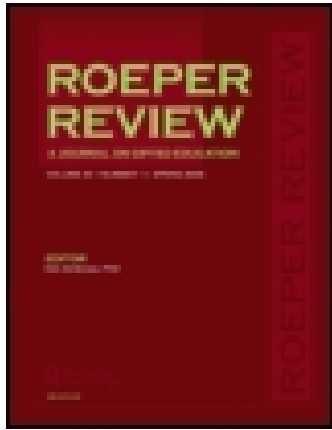


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## Roesper Review

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/uror20>

### High IQ children at midlife: An investigation into the generalizability of Terman's genetic studies of genius

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Published online: 20 Jan 2010.

To cite this article: Rena F. Subotnik , David E. Karp & Elizabeth R. Morgan (1989) High IQ children at midlife: An investigation into the generalizability of Terman's genetic studies of genius, Roesper Review, 11:3, 139-144, DOI:

[10.1080/02783198909553190](https://doi.org/10.1080/02783198909553190)

To link to this article: <http://dx.doi.org/10.1080/02783198909553190>

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# High IQ Children at Midlife: An Investigation into the Generalizability of Terman's Genetic Studies of Genius

Rena F. Subotnik  
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Hunter College Elementary School has been a laboratory school for intellectually gifted children since 1941. One hundred fifty-six men and women from the first 12 graduating classes completed a slightly modified version of Terman and Oden's midlife questionnaire. This study compares the responses by Terman subjects and the Hunter subjects to items describing occupational, marital, health, and political status, as well as what they find satisfying and important.

The authors acknowledge the invaluable assistance of Brondi Borer, the Parents Association of Hunter College Elementary School, Paula Diamond, Donna Shalala, the Schuster Foundation, the University Computing Center and the Inter-University Consortium for Political and Social Research.

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Their lives were too human for science,  
too beautiful for numbers, too sad for diagnosis  
and too immortal for bound journals.

Human beings need science.

But science never does human beings justice.

- G. E. Vaillant (1977)

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## Background

Sixty-seven years ago, Lewis Terman established what was to become the longest continuous study of a single cohort (Sears, 1984). He sought to explore the relationship between childhood intellectual acuity and adult productivity, health, and life satisfaction. The Terman study cohort group, identified at approximately age 10 as intellectually gifted, evolved by midlife into relatively well adjusted, productive adults. More specifically, the collected data supported Terman's contentions that (a) advanced intellectual development in childhood does not lead inevitably to social displacement, and (b) that one could predict, with some confidence on the basis of a psychometric measure of intelligence, greater degrees of adult productivity than had been found among the general population (Terman & Oden, 1959).

The Terman study has been criticized for the limited range of socioeconomic status and geographical origin of his cohort group. A disproportionate number of his subjects came from homes where the father was a professional, and all 1,528 subjects were from the Los Angeles and San Francisco Bay Areas (Sears, 1984). Despite these criticisms, the Terman study still serves as a cornerstone in the literature on the characteristics of high IQ children and adults. The purpose of the present study is to investigate the generalizability of Terman's conclusions by comparing responses to the Terman-Oden mid-life questionnaire instrument with a group of contemporary adults of similar socioeconomic background but of a different region and generation, who at age 8-10 scored in the gifted range on the Stanford-Binet intelligence test.

## Subjects

The first of two subject groups described in this present study includes those individuals who were tested by Terman or his associates at mean age of 9.7 with the 1916 edition of the Stanford-Binet, and were still participating in the study in 1950. In order to maximize comparability between study groups, only those Terman subjects who were tested with the Stanford-Binet by Terman or one of his associates, and whose raw data are available through the Inter-University Consortium for Political and Social Research (ICPSR) were included. (Some of the subjects Terman included in his study were admitted on the basis of group test scores only.) The Terman group in the

present study therefore includes the 304 females (IQ mean=147, median=145, range=115-174) and 284 males (IQ mean=149, median=148, range=120-180) whose coded responses are contained in the IC<sup>2</sup>SR data bank as having been tested individually with the Stanford-Binet by Terman or one of his associates.

The comparison group is composed of 156 graduates of the Hunter College Elementary School presently aged 38-50, including 82 females and 74 males. This group was identified during their elementary school years as intellectually gifted using the 1937 Stanford-Binet (Forms L-M). Hunter College Elementary School was established in 1941 as a laboratory school for intellectually gifted children living in New York City, and was suggested by Terman as an appropriate comparison group for his longitudinal study (Seagoe, 1975). Because of the laboratory nature of the school, the children who attended during the late 1940s and throughout the 1950s were tested frequently. For the purposes of comparability with the Terman group, IQ scores recorded at Hunter derived at approximately age 9 were used to identify the Hunter subjects for this study. In order to address the slightly greater selectivity of a 140 IQ score on the 1916 version of the Stanford-Binet as compared to the 1937 version (Seagoe, 1975), only individuals scoring 140+ were included in the Hunter group (male IQ mean=160, median=159, range=141-196; female IQ mean=158, median=156, range=140-196.)

Each graduating class at Hunter College Elementary School included approximately 50 students. The total possible population for the Hunter group was therefore 600. After 28 to 40 years, addresses for 375 of the 600 were derived through newspaper advertisements, high school alumni newsletters, telephone book searches, and word of mouth. Two hundred and thirty subjects completed and returned the seventeen page questionnaire. Data on 61 of those subjects were not included in the present study because the individuals did not have an IQ score available in the school archives or their reported IQ at approximately age 9 was below 140.

### Instrumentation

During 1950-51, Lewis Terman and Melita Oden conducted a follow-up of the Terman cohort group at mid-life. The follow-up consisted of a mailed questionnaire designed to elicit data on the occupational, marital, political, social, and health status of group members. The same instrument, with minor changes

relating to subjects' memories and impressions of their elementary school experience, was mailed to the Hunter group.

The data reported below are limited to 13 of the over 100 variables incorporated in the questionnaire instrument. The variables focus on describing the subjects' occupational, marital, health and political status as well as what they find satisfying and important. The remaining variables will be reported in other forums.

## Results and Discussion

### Marital Status

As can be seen in Table 1, both Terman and Hunter groups have similar profiles of marital status. Ten percent of each group remained single. A somewhat larger group of Hunter graduates divorced than did Terman group members, a likely result of changing societal views of marriage and divorce. The marital status of both groups was not significantly different from that of their contemporaries (Sears, 1984).

### Religious Affiliation

Terman discovered a disproportionately large number of Jews in his longitudinal cohort population (slightly

over 10% of 1528 individuals) given the small number of Jews living in the San Francisco Bay Area and Los Angeles in the 1920's (Oden, 1968). Terman simply noted this statistic and did not speculate as to why some religious/ethnic groups were more represented in his study than others. The Hunter group is also disproportionately Jewish (62.3%) in a city where the Jewish population has remained at approximately 20-25% for the last 40 years. A possible explanation for the large proportion of Jewish children attending Hunter Elementary School in the 1950's was the tendency for Catholic families to send their children to Catholic schools, Protestant families to the myriad private schools in New York City. Jewish children, for the most part, attended public schools and Hunter provided an alternative closely replicating the private school experience.

### Highest Degree Attained

Specific data limited to the Binet tested Terman subgroup were not available for this variable, therefore, percentages in Table 3 are derived from the entire sample of 1528 individuals in the Terman study. A third of the Terman men and 41.7% of the Terman women completed college during the 1930's, when only 8% of the general population was graduating from college (Terman & Oden, 1959). Nearly 40% of both the Terman and

Table 1  
Marital Status  
(in percentages)

	Terman	Hunter
Single	10.5	9.7
Married	72.9	59.1
Married, Separated	.4	1.3
Married, Divorced	3.1	14.9
Married, Widowed	.4	—
Married, Divorced, Married	10.1	13.6
Other (multiple marriage)	2.5	1.3
n	484	154

Table 2  
Highest Degree Attained  
(in percentages)

	TM	TW	HW	HM
Terman Men=TM, Terman Women=TW, Hunter Men=HM, Hunter Women=HW				
Below Bachelors / No Response	13.9	31.4	1.4	3.7
Bachelors Degree	33.3	41.7	16.2	19.8
Masters	15.0	21.0	14.9	43.2
Ph.D., L.L.B., J.D., M.D.	37.8	5.9	67.6	40.3
n	857	671	74	82

\* Terman data from entire Terman subject pool

Hunter men pursued terminal degrees while only 5.9% of the Terman women completed doctoral or professional degrees in law or medicine. In contrast, over two-thirds of the Hunter women were holders of the Ph.D., M.D. or L.L.B. degree. The dramatic proportion of terminal degree candidates among the Hunter women did not however, translate into more prestigious careers or higher income as compared with Hunter men.

### Occupations

Table 3 displays the percentage of Terman and Hunter subjects who participated in various careers at midlife. The Terman men were widely distributed among professional and semi-professional careers (categories were determined by Terman from the Minnesota Occupation Scale, Terman & Oden, 1959). No category except catch-all groupings included more than 8% of the Terman men. On the other hand, over 51% of the Hunter men were either lawyers, physicians or college professors.

As might be expected, dramatic social changes have affected the pattern of employment experienced by highly gifted women. Nearly 50% of the Terman women identified themselves as housewives. In fact, the occupational status of the women in Terman's sample was lower than that of both their gifted male peers and the general population of college educated American women at that point in time (Eccles, 1985). Terman bemoaned the discrepancy between the accomplishments of the men and women of his longitudinal study group, given their comparable intellectual ability and educational success. He acknowledged the role of societal expectations and lack of opportunities for women, and hoped that the public could acknowledge the indirect and intangible ways that these women contributed to the good of society.

In contrast, only 1.2% of the Hunter women described themselves as housewives. The most popular career choices among this highly educated group were college teaching, school teaching, psychologist and journalist. It should be noted that although the Hunter women achieved relatively prestigious degrees and careers, the mean income of the Hunter women is \$47,391 (median=\$40,000, range=\$11,000-\$180,000) while the mean income of the men is \$105,000 (median=\$75,000, range=\$5000-\$505,000). The income discrepancies remain constant even when matched by profession. Higher degrees and comparably high intellect did not assure gifted women of equitable financial rewards for their professional efforts.

**Table 3**  
**Occupations**  
(in percentages)

TM = Terman Men, HM = Hunter Men, HW = Hunter Women, TW = Terman Women

	TM	HM	HW	TW
Actuary, Accountant	6.3	4.1	3.7	1.0
Advertising, Public Relations	0.7	2.7	6.1	2.0
Architect	1.4	—	—	—
Artist/Composer	0.4	2.7	1.2	—
Author, Editor, Journalist	3.5	8.1	11.0	1.6
Banking, Finance	3.5	2.7	2.4	0.3
Chemist	3.5	—	1.2	—
Clergy	1.1	—	—	—
Clerical	0.7	—	—	1.0
Commercial Artist	0.4	—	1.2	0.3
Engineer	4.9	—	—	—
Executive Manager (business)	7.4	4.1	7.3	6.9
Executive Manager (entertainment)	2.1	—	1.2	—
Government Service (not local)	2.8	—	2.4	—
Housewife	—	—	1.2	49.3
Insurance/Real Estate	0.4	2.7	3.7	0.3
Lawyer	6.3	20.3	3.7	0.3
Military	2.8	—	—	—
Misc. Other (farmer, carpenter)	10.1	—	—	—
Misc. Professional (dentist, psych.)	1.4	8.1	12.2	5.3
Misc. Semi-Professional (contractor)	2.1	2.7	1.2	—
Musician (not school)	0.4	1.4	—	0.7
Physician	3.2	17.6	3.7	—
Physicist	1.1	2.7	—	—
Professional Service (non-school teach)	1.1	—	1.2	0.3
Retail Business Owner	0.7	1.4	2.4	—
Sales Manager	2.5	1.4	—	—
Social/Vocational (social worker)	0.7	—	1.2	1.3
Student	1.8	—	1.2	—
Teaching at College	4.2	13.5	15.9	2.3
Teaching below College	3.9	1.4	13.4	5.9
Unable to Work	0.4	—	—	0.3
Unclassified/No Answer	18.3	—	—	18.4
n	284	74	82	304

### Feelings about One's Present Vocation

No significant differences by group or by sex are reported on a Likert-type item assessing satisfaction with career. The item scale ranged from 1 to 5 with 1=strong dislike and 5=deep satisfaction. The means for both groups were over 4.3.

### Political Self-Rating and Affiliation

Both groups attended college and graduate school during periods of great liberal upheaval and completed their respective questionnaires during periods of emerging conservatism. Yet each group evolved distinct political convictions at midlife. A statistically significant difference exists between the two groups in terms of political self rating. On the 9 point scale with "1" counting as extremely radical (left) and "9" extremely conservative, the mean rating for the Hunter group was 4.5938 and the Terman group

5.3676, although the Terman group had been somewhat more liberal in the decade of the 40's (Terman & Oden, 1959).

When political philosophy was translated into party affiliation Hunter graduates voted overwhelmingly as Democrats (70.5%) while the Terman group was more evenly split between the two major parties (Democrats=29.4% and Republicans=44%). Party affiliation and political self-rating appear to have been influenced by ethnic, regional and temporal concerns rather than by intellectual ones.

### General Health

A large majority of the Terman and Hunter subjects described their general health at midlife as very good or good, with the Hunter group describing their health more often as very good. Anecdotal data from the Hunter questionnaire, including the following comment,

give a more detailed picture of the subjects' medical history:

...generalized Jewish angst, peaking around tenure time, but I don't know if you can relate to that.

### Mental Health and General Adjustment

Under 10% of the members of the two high IQ groups described themselves as having had considerable difficulty in the area of mental health and general adjustment (see Table 4). Of this subgroup of individuals with a history of mental illness, 24% of the Terman men and women and 7.3% of the Hunter men and women still suffered at midlife from at least occasional relapses. Terman found that maladjustment among women, but not among men, increased with IQ (Terman & Oden, 1959). More detailed exploration of the relationship between mental health and IQ among Hunter women was difficult to analyze given the small number ( $n=6$ ) of Hunter women reporting maladjustment.

### Factors Furthering and Hindering Life Accomplishment

Table 5 reports on the factors that both Hunter and Terman men and women identify as having had an impact on accomplishing life goals. All four groups acknowledge the importance of receiving an adequate education and having superior mental ability. Terman subjects also considered mental stability as essential to realizing their life goals. Hunter men and women relied more on persistence and personality. On the other hand, when analyzing the data on hindering factors to life achievement (see Table 6), the Terman men and women identified lack of effort (poor work habits, persistence) as a major reason for not having achieved goals. In addition, the Terman group was slightly more dissatisfied than the Hunter group with the amount of schooling they received probably because of the Depression and World War II. The Hunter men and women tended to blame poor outcomes on bad luck or the actions of others. It should be noted that a much smaller proportion of study subjects from each group identified hindering in addition to helpful factors.

### Living Up to One's Intellectual Abilities

An analysis of variance was utilized to compare the means of the Terman and Hunter groups by sex on a scale of "living up to one's ability" with 1=a total failure and 6=fully. A significant difference favoring the Hunter group was found with no interaction effects due to sex. The interaction effects may have washed out because each gender group may have had different rationales for describing themselves as satisfied

**Table 4**  
**Mental Health and General Adjustment**  
(in percentages)

	TM	TW	HW	HM
Satisfactory	58.8	59.5	73.2	66.2
Some Difficulty	15.1	17.4	19.5	20.3
Considerable Difficulty	9.5	5.6	7.3	8.1
No Response	16.5	17.4	—	5.4
n	284	304	82	74

**Table 5**  
**Factors Contributing to Life Accomplishment**  
(in percentages)

\*each subject could check any number of possible responses  
Terman Men=TM, Terman Women=TW, Hunter Women=HW, Hunter Men=HM

	TM	TW	HW	HM
Adequate Education	80.6	79.4	89.1	91.4
Chance Factors	18.0	10.1	37.5	35.7
Excellent Health	52.4	56.0	70.3	57.1
Good Mental Stability	65.5	66.8	76.6	72.9
Good Personality	58.7	58.5	82.8	74.3
Good Social Adjustment	51.9	63.4	76.6	61.4
Good Work Habits	42.2	37.4	62.5	57.1
Helpful Person (spouse)	46.6	37.3	72.3	54.3
Persistence Toward Goals	51.9	43.4	70.3	74.3
Superior Mental Ability	67.5	60.2	86.9	91.4
n	206	217	80	70

**Table 6**  
**Factors Hindering Life Accomplishment**  
(in percentages)

\*each subject could check any number of possible responses  
Terman Men=TM, Terman Women=TW, Hunter Women=HW, Hunter Men=HM

	TM	TW	HW	HM
Chance Factors	11.9	14.3	41.9	29.2
Hindering Person (spouse)	23.8	13.1	41.5	37.5
Inadequate Education	17.9	16.8	3.1	—
Inadequate Mental Ability	3.3	4.2	1.6	2.1
Lack of Persistence Toward Goals	48.3	47.9	20.3	33.3
Mental Instability	16.6	12.6	6.2	14.6
Poor Health	9.3	16.5	3.1	—
Poor Personality	16.6	8.7	18.7	39.6
Poor Social Adjustment	28.5	23.1	7.8	18.8
Poor Work Habits	33.8	36.8	18.7	31.3
n	151	147	43	48

with the degree of intellectual challenge in their lives. Terman found that his men tended to be affected somewhat by the level of their income whereas the women tended to judge fulfillment on the basis of the status level of their profession (Terman & Oden, 1959). If these rationales remain true today, the higher sense of fulfillment on the part of

the Hunter group may be explained by the relatively high mean income of the men and the improved occupational status of the women.

### Sources of Satisfaction

Both study groups acknowledge the centrality of their work and families to their sources of life satisfaction. Each

subgroup however, responded in a unique pattern. More Terman men derived satisfaction from their work (80.6%) than from their families (65%). Hunter men as a group also ranked work first (91.4%) and children second (70%). Marriage and avocational interests tied for third at 58.6%. The Hunter women's pattern of response also reflected a lower relative position of marriage (64.1%) for Hunter subjects as a source of satisfaction as compared to work and children (75% each). The Terman men and women ranked marriage and children equally relative to other possible areas that provide life satisfaction. Terman women chose children (70.6%) and marriage (70.3%) followed by social contacts (50%), probably reflecting the large representation of housewives in the group (Birnbaum, 1975).

### Definition of Success

Members of both subject groups were asked to identify variables associated with success. This item was presented in an open format so that subjects could generate their own responses. A sampling from the Hunter subjects' responses to this item include:

1. love and work, looking forward to going to work and coming home
2. a deep sense of satisfaction and accomplishment
3. being well balanced, lucky enough to make a good living at something you enjoy
4. work which provides benefits to society transcending narrow self-interest
5. utilizing to the fullest, one's natural qualities in combination with the opportunities available

Responses were coded according to the categories listed in Table 8. Both Hunter men and Terman women defined success in much the same terms as they had described the sources of their life satisfaction. When open responses were generated by subjects however, the relative importance of work for Terman men was slightly lower than that of family, income and helping others. Hunter women associated success with vocational satisfaction, peace of mind and friendships more than happy home and family. The lack of congruence between those groups' responses to sources of their life satisfaction is noteworthy. Were their sources of life satisfaction not exactly what they thought they ought to be in order to be successful?

### Summary and Conclusions

Replicating Terman and Oden's mid-life study resulted in a similar profile of high IQ children grown up. Both groups evolved into productive professionals with good mental and physical health, and stable interpersonal relationships.

The most dramatic differences evidenced between the Terman and Hunter groups are those found between the groups of women. The increased availability of occupational and educational opportunities has led to a shift in life satisfaction and success values closer to those exhibited by the Terman and Hunter men (Sears & Barbee, 1977). In fact, in more recent interviews, even the Terman housewives expressed some regret for having neglected their professional development (Eccles, 1985).

In general, both studies support the notion that high intelligence as measured by IQ is a useful variable in pre-

dicting productivity in academics and the professions but not the aesthetic or political arenas (Goertzel & Goertzel, 1962; Terman & Oden, 1959). Yet, non-intellective factors such as motivation, flexibility, social intelligence, ethnic culture and chance play an essential role in differentiating whether or not an individual will live up to his or her intellectual potential (Clausen, 1981; Goleman, 1980; Oden, 1968; Seagoe, 1975; Walberg, Rasher & Hase, 1983). Like the Terman group, none of the members of the Hunter group has (yet) achieved the status of a revolutionary thinker. Individually initiated radical change may need to emerge out of obsession, and few of the Hunter graduates describe an obsessive relationship with work or avocational interests. Some subjects expressed a certain wistfulness about youthful idealism lost to societal expectations:

1. I have developed a new approach to life with lower standards and greater toleration for my own human imperfections.
2. I have experienced a loss of idealism as working to support a family becomes more important. When people told me earlier that that might happen, I said it wouldn't happen to me.

### Limitations of the Study

Obtaining access to people and data from nearly 40 years ago is inherently problematic. As a result, no one at Hunter College or the Hunter College Elementary School has previously attempted to follow up on the elementary graduates. For example, the only addresses on file were those of the parents while the child attended the school. Fortunately, given the state of the New York City housing market, checking those addresses against the 1988 Manhattan phone book proved to be fairly productive. Despite the amount of time passed and the expense of tracking down individuals, the return rate of over one-third of the entire possible population was very encouraging. The search continues.

The Terman midlife questionnaire was, by today's standards, poorly designed. Deeply personal questions about the amount of alcohol consumed and record of arrests are asked on the third page ahead of less threatening items about hobbies and political affiliation. Response options of the Likert type were not always well calibrated. Finally, some issues were explored in detail, such as the physical and mental condition of subjects' offspring, which reflected Terman's interest in genetic

**Table 7**  
**Sources of Satisfaction**  
(in percentages)

*each subject could check any number of possible responses				
	TM	TW	HW	HM
Terman Men=TM, Terman Women=TW, Hunter Women=HW, Hunter Men=HM				
Avocational Interests	49.0	49.4	51.6	58.6
Children	65.5	70.6	75.0	70.0
Community Service	21.4	36.3	25.0	14.3
Income	34.0	14.7	34.4	51.4
Marriage	65.0	70.3	64.1	58.6
Other (romance)	7.3	8.6	33.3	8.6
Recognition for Accomplishments	54.9	31.6	68.7	55.7
Religion	13.6	12.5	17.2	14.3
Social Contacts	31.1	50.0	54.7	45.7
Work Itself	80.6	46.7	75.0	91.4
n	206	222	77	70

**Table 8**  
**Definition of Success**  
 (in percentages)

TM=Terman Men, TW=Terman Women, HW=Hunter Women, HM=Hunter Men

	TM	TW	HW	HM
Adequate Income	15.3	7.7	6.1	11.1
Aesthetic Values	1.1	0.2	1.3	1.1
Friends, Friendship	5.5	7.2	12.2	8.9
Full Life	1.3	2.2	2.2	2.6
Good Adjustment	1.8	5.4	3.9	3.2
Good Health	2.2	1.8	2.6	1.6
Happ / Home, Family	15.5	16.1	10.5	13.2
Helping Others	15.3	14.6	8.7	5.8
High Ideals	0.0	0.2	0.9	0.5
Integrity, Honesty	2.4	2.0	1.3	4.2
Justice, Tolerance	0.2	0.4	0.4	1.1
Leisure, Fun	2.4	3.0	0.9	2.1
Living up to Ability	3.5	5.2	7.9	3.7
Peace of Mind	9.2	13.1	14.8	11.6
Personal Independence	0.9	0.7	1.3	2.6
Recognition for Accomplishments	5.0	1.5	2.2	4.7
Religious Values, Spiritual	0.9	1.5	0.4	0.5
Social Success	1.1	0.9	0.4	0.5
Striving for Goals	1.3	2.0	2.6	3.2
Vocational Satisfaction	14.4	13.3	17.0	15.3
n	189	221	75	64

contributions to intellectual potential, as compared to today's focus on environmental variables that can have educational implications.

The ICPSR is a data bank containing raw data from hundreds of studies. The entire Terman cycle of data including the codebooks are available to researchers at participating universities. Because the data were collected before the advent of modern data entry procedures, inexplicable gaps of information occur. Consequently, not all of the Terman subjects' responses could be sorted out for comparison with the Hunter group.

### Future Directions for Research

Further analyses of data collected from the Hunter College Elementary School group will be conducted from various perspectives modeled after other analyses conducted with the Terman data set, e.g. comparing subjects who skipped grades with those who did not (Janos, 1987), most "successful" as compared to "least successful" (Seagoe, 1975), and those who chose careers in science as compared to those who chose other vocations (Terman, 1954). These reports as well as in-depth, face-to-face interviews with 100 of the Hunter subjects may help to flesh out the relationships among school

and family environment, geographic location, global and national events, personality, and chance on the adult fulfillment of childhood high intellectual potential.

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