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The Achievement of Eminence: A Longitudinal Study of Exceptionally Gifted Boys and Their Families*

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So long as we trace development from its final outcome backwards, the chaining of events appears to be continuous, and we feel we have gained an insight which is completely satisfactory or even exhaustive. But if we proceed in the reverse way, if we start from the premises inferred . . . and try to follow these up to the final result, then we no longer get the impression of an inevitable sequence of events which could not have been otherwise determined. . . . Hence the chain of causation can always be recognized with certainty if we follow the line of analysis (i.e., reconstruction), whereas to predict it . . . is impossible.

—Freud, 1955, pp. 167–168

BACKGROUND

From a developmental perspective, the attainment of eminence must involve family members, close mentors (often peers), and educators, within at least two major transformations: The first is both cognitive and personality based and helps convert early giftedness into creative potential. An important experience in this transformation is the early identification by others and the self-discovery and use of one's giftedness. This is often an outgrowth of other general experiences within the family, but central to it are an appreciation of the specifics of one's gifts (e.g., I *am* a poet, the young T.S. Eliot discovers), confidence in one's ability, and initiative in family expe-

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riences with a growing sense of autonomy (Albert, 1992; Ochse, 1990). This transformation usually occurs within the first four Eriksonian developmental stages in which, on balance, the child acquires workable capacities for trust, autonomy, initiative, and industry. Critical experiences generally include responding to and exploring novelty, setting goals for oneself, and being able to stand and meet comparisons with others—family and peers—without feeling overly competitive or inadequate, acts which help in gaining self-confidence through one's own efforts. (One of the clearest depictions of these processes is Eudora Welty's, 1984.)

Even among the exceptionally creative a second transformation is apparently necessary during adolescence and early adulthood. This transformation appears to be more critical and more permanent in its influence on creativity than the first because it comes during a time of ego and personality stabilization (Conley, 1985; Hauser, 1991). It is during these years that one can begin to predict the possibilities for real-life creative behavior. One must see a well-balanced set of cognitive skills, increasing focus on one's own interests, the presence of aesthetic values, and problem-oriented critical personality dispositions (especially for autonomy and calculated exploration and risk taking). Energized by moderately strong ambition and achievement motivations, this constellation can lead to a highly committed, socially responsible, and intrinsically motivated individual with high abilities focused on a specific area of interest (Albert, 1990; Bloom, 1985).

Although these developments occur over a broad span of time and in multiple settings, evidence for them most often appears first within the family, and then eventually outside of it. Eminence is rarely, if ever, achieved through a dependence on conventional thinking in defining and solving significant problems (Campbell, 1960; Gruber, 1986; Howe, 1982; Lumsden & Wilson, 1981; Nicholls, 1983). It has become increasingly evident that one salient characteristic of healthy development and eminent careers is the ability to think and work in a recognizably individualized (but not bizarre) manner. This capacity can be learned over a lifetime as a product of experience and becomes part of one's adult identity (Albert, 1991; Holton, 1973; MacKinnon,1962; Wallingford, 1988). Moreover, once in place this part of one's identity becomes consolidated and operates over long periods of time, influencing both the quality and persistence of one's creative behavior (Dudek & Hall, 1992).

Over the years empirical work has demonstrated several conspicuous features about eminent persons. In spite of their differences,

lifelong, as we see in Block, Block, and Keyes (1988), Helson's (1985), and Vaillant's (1977, 1983) ongoing work.

This project's earliest and sustained goal has been to find, test, and document the developmental continuities and discontinuities between and within two groups of exceptionally gifted boys, focusing on cognitive and personality developments that influence participants' education, career choices, and career achievement. The most important analyses are comparisons. The project was initially designed to maximize the clarity of these comparisons. The present research's significance comes from several of its salient characteristics, including its longitudinal time span, the diversity of measurement instruments used, and the variety and different levels of data generated through the participation of both parents and their gifted child on tests and through extensive interviews. The initial research issue raised in this project had to do with the effect of cognitive giftedness, family dynamics, and experiences on children of different levels and types of giftedness (Albert, 1969).

Soon several other important questions followed which implicated the role of temperament/environment interactions (Scarr & McCartney, 1983). Can early intrafamily factors be altered or enhanced by later variables such as educational opportunity, mentors, career opportunities and choices? If so, how? In short, how locked in are exceptionally gifted boys to their early personality and family characteristics and domains of giftedness? And implied here is the question: Can creativity be deliberately enhanced or even taught after childhood?

The guiding hypothesis of the project is the view of giftedness as exceptionality (Albert, 1980), operating as an organizer (biological and psychosocial in nature), whose influences are both cumulative and epigenetic. Anna Freud's concept of developmental line describes this broadband sequence of influences as do early attachment behaviors (Tyson & Tyson, 1990). Organizers influence the child's own sensitivities to and choices of environmental exchanges, as well as determining many of the interpersonal responses the child experiences in the course of his or her development. Another interest concerns the development of psychological health from preadolescence and its possible linkage with noteworthy creative ability (cf. Ludwig, 1992; MacKinnon, 1983; Richards, 1990).

Creative potential was explored with both samples, first as independent variables then, in the context of family structure and interactions, as dependent variables, and also as predictors. An equally critical issue is whether parents themselves also show high degrees of creative potential. How did childrearing evidenced by the parents

influence the development of creative potential, independence, and ambitions of their exceptionally gifted sons? This information, which was derived from questionnaires and interviews, was used to determine not only if there were significant early cognitive and motivational differences among the families, but to explore why some families were more successful than others in facilitating their son's early creative potential.

To be confident of their ability to measure and hopefully predict later behaviors, all of the personality and cognitive measures used in this project were standard, extensively researched instruments being tested in this project for their predictive power in terms of adult eminence.

Sample

Because most personality and cognitive developmental trends show little stability until age 10 (Kagan & Moss, 1962), and different personality traits, factors, and styles may contribute positively to academic achievement at one age but negatively at another (Cattell, 1971), only exceptionally gifted boys within the range of 11-14 years were selected for this longitudinal research. Moreover, Stanley, Keating, and Fox's (1974) data had shown that at least among mathematically precocious youth, early adolescence may be too early to observe the "classic pattern" of high theoretical and aesthetic values and distinctively low(er) social, religious, and political values frequently found among creative adults. Most likely these value patterns require extensive periods of family modeling and encouragement, along with specific educational and avocational experiences, in order to develop (Monsaas & Englehard, 1990; Roe, 1952; Zuckerman, 1977). Observing our exceptionally gifted subjects longitudinally should make it possible to replicate some of these observations and observe how values impact on career choices and behavior.

Because most of the serious investigations on creativity and achievement of the time (circa 1960-1970) were male-centered, only male subjects were used. To have added an equivalent number of females would be to study a sample whose size and complexity would have been beyond the capacity of this project's resources, and in the case of equally exceptionally gifted Math/Science girls, extremely difficult to locate (cf. Stanley & Benbow, 1981-1982). Third, Helson was undertaking her own longitudinal investigation of creative and

noncreative college women (Helson & Moane, 1987). Although not focused directly on eminence, this project was and has remained focused on women's career choices and developments. In fact, although unintended, the interested reader will find both conceptual and empirical complementarity between this project and Helson's (cf. Helson, 1985, 1987). Lastly, the author was the father of two gifted boys who showed striking differences, raising the question of how it was possible for full brothers, one year apart in age, to be gifted in different domains.

With all this in mind, the project was designed as a straightforward two-sample longitudinal study in which two closely matched cohorts, differing primarily in one basic cognitive ability, were measured repeatedly with the same instruments at the same age after the same length of elapsed time. Within this time span, now 18 years, two follow-up studies have taken place—when subjects were in high school and four years later in their early adulthood. A third follow-up is planned for 1992-93 now that the subjects are at an age when many eminent careers appear to take off (Albert, 1975, 1992; Raskin, 1936; Simonton, 1984).

Methodology

For all its power, there are standard problems involved in a longitudinal study, such as the attrition of subjects over time, the high level of commitment necessary on the part of the participants, the sampling biases introduced in selection of samples, and the effects of being assessed repeatedly, whether or not the same instruments are used time and again. We were prepared for some of these problems, and in other ways we have simply been fortunate.

Potential problems have been met in the following ways. First, to minimize bias in selection, specific psychometric and age criteria were set before any subject was contacted. The selection of all 54 subjects was by persons other than the principal researcher. For example, in 1977 the first step in contacting the 26 families of our math-science subjects was through the Johns Hopkins University Study of Mathematically Precocious Youth (SMPY). All families of boys in the top 99th percentile on the SAT-M were sent a detailed description of the research, its basic rationale and general goals, a statement of the principal researcher's credentials and publications, accompanied by a covering letter from SMPY's director Julian Stanley confirming this information. At this time, the families were sent letters of consent to sign if they wished to participate and a postal card directing me to contact them for further information. All subse-

quent meetings were with the permission of the families and at their convenience.

The same procedure was used in 1978 in the Southern California area to select the second sample of 28 exceptionally high-IQ boys. The same information about the project, letters of consent, and postal cards were sent by the directors of Mentally Gifted Minors programs in four school districts to all of the families within their district who had 12-year-old sons meeting the criterion of a 150+ IQ. Again the basic decision to participate or not was made by, and has remained with, the participants.

Because all participants are volunteers, a high level of interest in and motivation to participate in the project was virtually assured. Nonetheless, a problem of bias in the samples was introduced through the self-selection of subjects. An important reason for family participation was that at the onset they were told that the initial observations and interviews would be the most time consuming and personally demanding of all assessments. This was especially so for the parents. But by the same token, it was the intensive and personal nature of these interviews that allowed a deeper relationship to form between almost all of the participants and the investigator. In the process of getting to know the parents, we found that they were usually quite interested in the education and development of their gifted children. A number of families were familiar with the popular literature on giftedness. Clearly they were motivated to learn from the interviews and the project.

Because there would be long intervals between meetings, personal contact has been maintained with all families through seasonal cards, telephone calls, and some visits. As it was stressed initially by the interviewer and specifically in the letter of consent, all participants were (and have been) free to leave the project for whatever reason(s) without an explanation. Forcing them to remain when they no longer wished to could engender feelings of resentment and constraint, and therefore bias whatever data were being gathered.

Instruments and Procedure

Two major considerations guided the selection of instruments and procedures. First, all instruments had to have demonstrated high levels of reliability and validity. They were standard instruments well established in the research literature on giftedness, creativity, and personality assessment (e.g., Runco, 1991; Wallach 1983, 1985; Wallach & Kogan, 1965). Just as critical to the project, two complementary sources of data were used: A psychometric measure was

paired with either in-depth interviews or observable behavior and independent reports (e.g., G.P.A., academic progress, awards, etc). There are two reasons for using the complementary forms of data collection. One was to assure that data on important variables were acquired through at least two independent sources. Just as important, we would be able to compare the predictive validity of the various sources of data in the achievement of eminence. The measures used and most of the questions asked of parents and subjects were the same, allowing for a number of comparisons between parents and child.

Initial data collection (1977-1979). This consisted of two extensive open-ended interviews, one with both parents together and a later one with each parent alone. (Both interviews had been extensively pretested on families with an exceptionally gifted son the same age as the prospective subjects.) The interview with parents together consisted of questions developed by Albert and from Marjoribank's (1979) semistructured interview. The instrument covered the parents', grandparents', and siblings' early and contemporary demographics, educational and occupational history, as well as measuring the families' presses for Achievement, Activity, Intellectual interests, Independence, and each parents' involvement in the child's development (Marjoribank, 1979; see Table 11.1.) The parent-alone interview covered each parent's early family history, educational experiences, and aspirations, recalling when the parent was the same age as their son. This interview covered parents' description of their own parents (the indexed child's grandparents), their aspirations, and involvement with the parent as a child and adolescent. Also investigated were each parent's present sense of the son's future personal and social development, especially as these pertained to career goals and achievement. Lastly, each parent was asked to make a descriptive prediction of his or her son's future, occupationally and in general. All interviews were tape recorded except in two cases in which a parent requested no taping. One important consequence and a benefit from having all interviews conducted only by the principal investigator is that a high level of consistency in style, emphasis, and interpersonal relationship was established.

After the first parent-together interview, a separate self-addressed, packet of standard psychological measures was left for each participant. Participants were instructed to fill them out independently, and when completed, to mail them back to the principal investigator. All were returned. The reason for leaving the packages

Table 11.1. The Environmental Forces and Their Related Environmental Characteristics Used in the Interview Schedule: Learning Environment in the Home*

Environmental Force	Reliability	Environmental Characteristics
1. Press for Achievement	.94	1a. Parental expectations for the education of their child
		1b. Social press
		1c. Parents' own aspirations
		1d. Preparation and planning for child's education
		1e. Knowledge of child's educational progress
		1f. Parental interest
		1g. Valuing educational accomplishments
2. Press for Activeness	.80	2a. Extent and content of indoor activities
		2b. Extent and content of outdoor activities
		2c. Extent and purpose of the use of T.V. and other media
3. Press for Intellectuality	.88	3a. Number of thought-provoking activities engaged in by children
		3b. Opportunities made available for thought-provoking discussions and thinking
		3c. Use of books, periodicals, and other literature
4. Press for Independence	.71	4a. Freedom and encouragement to explore the environment
		4b. Stress on early independence
5. Mother Dominance	.66	5a. Mother's involvement in child's activities
		5b. Mother's role in family decision making
6. Father Dominance	.67	6a. Father's involvement in child's activities
		6b. Father's role in family decision making

*Adapted from Majoribanks (1979)

at this time was to allow participants an opportunity to become familiar with the measures and, if necessary, to discuss them with the interviewer before he returned to California. During this first stage, no formal interviewing of the gifted child was conducted, although the purpose of the researcher's visit was explained to each subject, who was also required to sign a letter of consent. In the subsequent 4-year follow-ups, almost all of the questions asked earlier of parents about their childhood, educational and career aspirations, and experiences were now posed to the subject. This matching of parents' and children's interviews was designed for comparisons between the two sets of data, and to determine whether or not there are significant antecedent relationships related to crucial developmental outcomes. For example, both the parents and the subject were asked identical questions regarding independence

training and practices. The results were published by Albert and Runco (1989).

All interviews were subsequently transcribed and analyzed by two professionals, each with extensive clinical and research experience in family processes and individual interviewing; the Loevinger *Sentence Completion* tests (Loevinger & Wessler, 1970) were scored by other persons trained specifically on that measure.

Overview of Empirical Findings

Over the years, the project's conceptualization and empirical results have been closely linked. This has had the benefit of allowing readers to follow the progress of the project and to see how "new" questions may arise and lead to new and revised thinking (e.g., the recent appearance of crossovers and noncrossovers which will be discussed below).

From the beginning, the data and analyses have been organized into three main areas: Subjects' and parents' personalities separately and together, how these compare with one another and their relationships to sons' and parents' creative potential; the identification of creative potential among youth of different levels and kinds of giftedness. More recently, subjects' and parents' ego development have become a focus of analyses along with their early adult personalities, creative development and career decisions.

Demographic Characteristics of the Parents

In keeping with earlier research on gifted children, the exceptionally gifted boys' parents attained considerably more education than their national cohorts and with only one exception, they were clearly members of the middle to upper-middle socioeconomic classes. On these indices and race and religion the two samples were closely matched (Albert, 1980). Mothers averaged 16 years of education, and 65% of them were college graduates. Fathers averaged just over 17 years of education, and 90% were college graduates. Equally important, parents came from families in which formal education had been valued and pursued for several generations, a finding that supports the evidence of a good many biographies of persons eminent in a number of fields. Nineteen of the math-science boys' and eight of the exceptionally high-IQ boys' maternal grandparents were

college graduates. Among their paternal grandparents, the figures were six and seven, respectively, and all but three were high school graduates. Another example of the remarkably high level of education among the families are the 16 postgraduates among the grandparents. This is impressive when one considers the depression years and the more restricted opportunities available to them. In spite of these being extremely well-educated families, one interesting difference exists between the two samples: Many more of the exceptionally high-IQ group parents than the math-science group parents were the first college graduate in their families. The significance of this for sons' educational career choices have been reported in Albert and Runco (1987) and gives added weight for taking an intergenerational perspective on the transmission of parental influences (cf. Van Ijzendoorn, 1992, for a review of studies pertaining to this).

Birth Order and Special Family Position

Over the years social science literature (Altus, 1966; Schacter, 1963; Wagner & Schubert, 1979) has addressed the question of birth order as it may influence achievements. The premise is that one's birth order, like gender, predisposes both parents and the child to specific parent-child interactions and socialization practices. In several cases, this tends to be true, leading to regularly developmental outcomes such as accelerated academic performances of first sons and only children when compared to the other birth orders (Altus, 1966; Wagner & Schubert,1979). This outcome appears even more evident for gifted and talented children. One way to conceptualize this phenomenon among eminent persons has been to narrow the general category of birth order to a more specific type of family position which constantly occurs among eminent-to-be and eminent persons. I have designated this as a "special" family position (Albert, 1983). Both samples in this project had closely matched distributions of birth orders. Combined samples included 3 only children, 24 oldest children, 11 middle children, and 16 youngest children. The finding that first-born boys were the largest group in the sample supports the expectation that most gifted children will be either the oldest or only child in their families.

In addition to "specialness" there is another way of examining birth order, which is to look for parent-child birth order similarities and differences. It is assumed that a similar birth order for parents (especially fathers) and sons would influence dynamics within the families. In this regard I found a large difference between the two

samples. Among the exceptionally high-IQ boys, eight mother-son pairs and nine father-son pairs had matching birth order. A statistically significant difference from the exceptionally high-IQ sample are the three mother-son matchings and 12 father-son matchings in the math-science sample. Other research shows that among scientists, father-son (and less clearly daughter) relationships appear more salient and influential in sons' educations and career achievements than mother-son relationships (Eidnuson, 1962; Roe, 1952; Terman,1955). Just as important, the opposite appears in the case of adult artists, politicians, and socially committed college students (Albert, 1980; Barber, 1985; Goertzel & Goertzel, 1962; Keniston, 1965, 1968). Research shows that early father-son relations, as well as father absence (Storfer, 1990) can have a distinct bearing on a son's mathematical aptitudes (Howe, 1990). Looking at our samples, we find that among the math-science sample's 26 fathers, 17 had mathematically related degrees and careers, which suggests that one basis for the initial greater father-son similarity among math-science boys may be the interaction between their genetic similarity in mathematical aptitude and their similar birth orders (cf. Stanley et al., 1977, for an interesting discussion of this possibility, and Grotevant, Scarr, & Weinberg, 1978, for empirical evidence). It appears also that the more bases for father-son similarities, the earlier the identification of the son's particular giftedness (Albert, unpublished data) and the more likely there will be behavioral similarities leading to subsequent reinforcements. However, growing similarities and modeling may tightly bind the father and son, limiting the son's later explorations of self and development of interests and identity.

Another developmentally significant fact found among many eminents is the exceptionally high rate of early parental death experienced before age 16 (Albert, 1971, 1980; Bennington, 1983; Eisenstadt, 1978). Approximately 33% of American Presidents, British Prime Ministers, Cox's historical geniuses, and Roe's eminent American scientists underwent this exceptional experience. So far, no parental deaths have occurred among the samples. But there is one finding appearing during the second follow-up that highlights the developmental significance father-son relationships can have in sons' educations and careers. Eight sons who, as of the 1987-88 follow-ups, had absent fathers due to divorce and separation, were functioning educationally very much below their exceptionally gifted cohorts. This is important not only because of its profound developmental implications regarding father-son relationships, but because, according to research (Conley, 1985; Costa & McCrae, 1980; Rutter, 1989; Whitbourne, 1986), one's personality is very stable

from early adulthood on. If so, these young men have much to overcome.

Analyses Using IQ and Achievement Tests

The relevance of intelligence (IQ) for creative potential has been examined many times (Runco & Albert, 1986; Wallach & Kogan, 1965). The present data offered an excellent opportunity to test what is referred to as the threshold hypothesis. This holds that creativity and IQ are correlated significantly only in the lower and moderate ranges (e.g., IQ between 95-120). Other researchers (Barron, 1969) have found indirect evidence for this relationship, but the results have been anything but consistent, especially when gifted IQ measured by the Stanford Binet is the measure of intelligence (ranging from 146-165). The creative potential of subjects measured by Wallach and Wing's (1969) test of divergent thinking and their exceptionally high IQs were found to be negatively correlated on five different measures of creative potential (two divergent thinking tests, scored for fluency and originality, as well as with ratings from the Teachers' Evaluation of Students' Creativity; Runco, 1984). Correlations between moderately gifted IQs (between 121-130 and 131-145) and these measures of creative potential were small but positive and significant. There are three points to note here: (a) there are modest correlations in the opposite direction predicted by the threshold hypothesis for exceptionally high IQs; (b) these correlations are considerably higher than those for subjects in the 95-120 IQ range, which the threshold hypothesis would predict having large, positive correlation between IQ and creativity; (c) when using subjects' achievement test scores as the measure of intelligence, the results are opposite from those obtained when IQ is used (Runco & Albert, 1986). Among subjects in the top quartile of achievement scores, there were highly significant positive correlations between all of the creativity measurements and the achievement scores. (The opposite was the case for IQs.) Among the lower quartile groupings of achievement scores, however, achievement and creativity measures were not significantly correlated. Clearly, within particular ranges of IQ and achievement test scores, IQ scores and achievement scores relate inconsistently to creative potential, and quite often in opposite directions from one another. Neither set of data supports the threshold hypothesis, but they do support research by Chauncey and Hilton (1983), Nicholls (1983), and Stanley et al. (1977) showing that achievement tests are more reliable and accurate than IQ tests as estimates of "real-life" giftedness.

Other Creativity Assessments

Among the project's exceptionally gifted boys there were no significant correlations between the Biographical Inventory of Creativity (BIC) and Wallach and Wing's divergent thinking scores. Given their reliabilities and the evidence for their validity, one can feel confident that these are distinctly different measures of creative potential. The BIC taps a subject's vocational and avocational behaviors, preferences, and active interests. The Wallach and Wing test measures production of responses—the quantity and originality of a subject's divergent thinking in figural and verbal modes. Both samples of exceptionally gifted boys are significantly higher in creative potential when compared to same-age average junior high and high school boys (Albert, 1980), as assessed with both the BIC (Schaefer & Anastasi, 1968) and the Wallach-Wing (1969) divergent thinking instruments.

The same holds for their parents. Not only are the parents significantly better educated than their national cohorts, but their creative potential scores surpass both their sons' and large groups of Duke University male and female students', many of whom are exceptional in their own right. On all Wallach and Kogan (1965) divergent thinking scores—figural, verbal, and total—both samples' fathers scored significantly higher than male students from Duke University. Furthermore, with only the exception of the math-science mothers' figural subtest scores, all subjects' mothers' divergent thinking scores were higher than the Duke University students, male and female. To the degree that these parental paper-and-pencil performances have a bearing in the real world, we believe that these parents are modeling creative skills and at the same time are encouraging similar interests and modes of thought for their gifted sons. Moreover, extensive parental education has been found to positively influence early IQ scores *and* adult achievement (Ceci, 1990). When this is linked to differences in the complexity and style of causal reasoning ability between children and adults and among lay adults, lawyers, and psychologists (who also differ from one another; Kuhn, Amsel, & O'Laughlin, 1988), there is strong reason for believing that parents' own levels of education and creative potential will be powerful influences, not only in their sons' educational ambitions but in their reasoning styles and eventual levels of achievement. Supporting this possibility is MacKinnon's (1962) evidence that the families of creative subjects show a significantly greater preference for complex, asymmetrical patterns over conventional line drawings on the Barron-Walsh Art test than did the

families of noncreative subjects. Using different measures, a similar difference also appears in Weisberg and Springer's (1961) study.

Personality and Family Variables

Although "family" is defined in various ways in the social sciences, this project focuses on three components of each subject's family: the parents' personality dispositions as measured by the CPI and interviews, their creative potential, and the family presses (measured by Marjoribanks' Family Inventory, 1979, and interviews). Along with teaching the child what is essential information for becoming an acceptable family and societal member, families model and quite often explicitly voice their main values, customs, and goals (e.g., Monsass & Englehard, 1992). From among these family variables, I have selected those that may have a direct bearing on long-term achievement, intellectuality, and creative behavior (cf. Bloom, 1985; Getzels & Jackson, 1962; Howe, 1990; Ochse, 1990; Oden, 1968, for evidence of such family influences). The assumption is that parental behaviors operating early in a child's development can have an enduring influence on their developmental pathways (Rutter, 1989), facilitating a gifted child's becoming first a potentially creative person and, possibly, an eminent one. Certainly more complex than it appears, this assumption has considerable validity (Bloom, 1985; Howe, 1990) and appears to be also transcultural.

It has been clear from the start that both samples' scores on a variety of measures of creative potential had quite different patterns of interrelationships (Runco & Albert, 1986). The math-science boys' creative potential scores are specific to the particular measure used and the domain tapped; no two measures are significantly intercorrelated. The opposite holds for the exceptionally high-IQ boys' scores. All of their creative potential scores were significantly and positively intercorrelated. In general, creativity scores were independent of SAT and IQ scores, the exception being a moderate ($p = .05$) correlation between IQ and verbal divergent thinking. This suggests that giftedness in different domains is associated with different patterns and types of creative potential as early as age 12, and this in turn tells us that each sample goes into its teens with its own pattern of creative potential. Throughout the project, the math-science sample has been found to be far less influenced by their family and social environments than the exceptionally high-IQ sample. This was first mentioned by Albert and Runco (1986, 1987) and

Runco and Albert (1987), and will be further documented in several papers now in preparation related to parents and subjects' CPI profiles. The developmental consequence is that each sample's families is "working" with a distinct pattern and degree of developmental "openness."

This, in turn, leads to an important developmental issue: whether and to what degree creativity can be taught, and for whom, in what domains, and through what types of interventions and experiences (Brinkman, 1981; Howe, 1990, Ch. 2). For example, there is a significant positive correlation between parents' and sons' divergent thinking ($r = .55$; $p = .02$; Runco & Albert, 1986). One might expect this considering the long-standing claim of parent-child similarities in both talent and interest among eminent persons, beginning with Galton (1869; Goertzel & Goertzel, 1962; Grotevant, Scarr, & Weinberg, 1977; MacKinnon, 1962, 1983). But the data raise questions about this intrafamily similarity because the two samples' creativity scores related differently to their parents' scores. Math-science boys' divergent thinking test scores were significantly correlated *only* with their mothers' divergent thinking scores. This is particularly notable in light of the literature that holds that mathematical aptitude is more male-based and father-centered, and verbal aptitude is more female-based (e.g., the higher verbal and lower mathematic aptitudes often observed among father-absent sons). Yet among the exceptionally high-IQ sons one finds that their divergent thinking scores are significantly correlated with both parents' divergent thinking scores, making for another striking difference between the two samples. The relationship between parents' and childrens' divergent thinking may therefore be partly a function of the level of sons' and parents' cognitive ability as well as the domain of giftedness.

Other data underscore and confirm these domain differences on the Bond-Vaillant Defense Questionnaire, The California Psychological Inventory, and to a lesser degree, The Loevinger Sentence Completion Test. (These results are being prepared for publication.) In almost all analyses at age 12, the exceptionally high-IQ boys' personalities, defensive styles, and stages of ego development are clearly more similar to their parents—both parents—than are those of the math-science boys and their parents. A simple conclusion is that the exceptionally high-IQ boys are much more susceptible, or "open," to parental influences up through early adolescence than are the math-science boys. This is no simple matter but quite likely reflects a mix of heredity, selective identification differences in parental styles and modeling, and the influences of differing reinforcing

contexts. Nor are these the only intrafamilial cognitive differences between the two samples. Exceptionally high-IQ parents' (especially fathers') divergent thinking scores were highly significantly correlated with the sons' IQs. This is all the more important given that the boys' own divergent thinking scores are statistically independent of any index of their own cognitive ability.

California Psychological Inventory

Personalities are influential in how persons at any age think of themselves, and how they interact with others. Self-images and personality dispositions determine an individual's consistency within a variety of situations (Albert, 1992, p. 265; Conley, 1985) and interpersonal consistencies in everyday life (Conley, 1985). Because parents of gifted children have been found to have rather distinctive personality styles of their own (Southern & Plant, 1968; Viernstein & Hogan, 1975; Viernstein, McGinn, & Hogan, 1977), investigating the influences of parents' personalities may be one way of merging Galton's emphasis on heredity in the attainment of eminence with Freud's emphasis on dynamic experiential forces in the genesis of the personality traits and motivations that underlie the creative drives that result in eminence (Albert, 1975; Simonton, 1991).

The California Psychological Inventory (CPI) was chosen for its neutrality regarding intrapersonal pathology and its validity with a variety of populations including a number of specifically creative groups (Gough, 1987). We will first describe the parents' personalities, because they form part of the background for a family's dynamic influence on parents' perceptions, interactions, specific teaching strategies, and support for their sons' development.

There are two important ways in which the CPI profiles of the two samples of parents of the exceptionally gifted boys differ. First, the profiles of the exceptionally high-IQ mothers and fathers are significantly more similar to one another than those of the math-science parents. In fact, there is only one significant CPI difference among the exceptionally high-IQ parents: Mothers had higher Psychological Mindedness scores, as one would expect. Among the math-science parents, however, there were consistent parental differences. These fathers were significantly higher than the mothers on the CPI scales for Dominance, Self-Acceptance, Good-Impression, Intellectual-Efficience, Achievement through Conformance, and Well-Being. In general, the exceptionally high-IQ parents appear on the CPI to be more alike and more sociable, confident, and self-accepting than the math-science parents. They, in turn, are more interested in their

own Achievement through Independence, and more self-controlled then exceptionally high-IQ parents. These findings are consistent with results from studies of adult scientists (Chambers, 1964; Cox, 1926; Rushton, Murray, & Paunonen, 1983; Simonton, 1987; Terman, 1955) and with our two samples' family presses reported below.

Both samples' fathers' CPI profiles resemble those of creative architects and writers with their high need for Achievement through Independence, high degrees of Psychological Mindedness, Flexibility, and Femininity (Barron, 1969; MacKinnon, 1962). Somewhat surprisingly, and again a domain difference, the exceptionally high-IQ mothers' CPIs (but not, as one would expect, those of the math-science mothers) closely matched creative women mathematicians. The math-science mothers closely resembled female MENSA members (the high-IQ organization) in their CPI profiles. These results are counterintuitive insofar as one would expect either that the mothers would match MENSA females or that the math-science mothers would resemble women mathematicians.

At age 12, it was difficult to say if these results predicted the creative futures of the boys, although as we will report below, they did relate to age 12 creative potential. One unexpected family predictor of early creative potential was the degree of CPI intrafamilial similarity. Psychoanalysis postulates and data from Getzels and Jackson (1962), Goertzel and Goertzel (1962), MacKinnon (1983), and Weisberg and Springer (1961) suggest that parents' disagreements and their personality dissimilarity are sources of stress among families of creative children and eminent persons. On 11 of the 18 total CPI scales, exceptionally high-IQ parents' scores were more similar—that is, less a potential source of intrafamily stress—than the math-science parents. Math-science parents, in turn, were more similar to one another on only 5 of the 18 CPI scores. (These 5 scales are different from the 11 scales on which exceptionally high-IQ parents were matched.) Lastly, the two samples of parents' CPI profiles differed significantly on five scales: Dominance, Sociability, and Good Impression, on which the exceptionally high-IQ parents' scores were almost identical, and Responsibility and Achievement through Independence on which the math-science parents' scores were more similar (Albert & Runco, 1986).

Examined separately, the two samples again show domain differences. Low parental similarity is associated with high *general* creative potential among the exceptionally high-IQ boys, and high divergent thinking test scores among the math-science boys. Furthermore, there are three other significant (conceptually and

statistically) relationships between parents' CPI profiles and their sons' creative potential. First the parental CPI scale Capacity for Status was consistently negatively correlated with all boys' creative potential scores. This scale (Gough, 1987) is an index of parental ambitiousness and status seeking and indicates a high degree of concern for one's social acceptance. High scorers would tolerate very little deviance in their children without being anxious and vigilant. Other studies point to a strong relationship between high concern (worry) for conventional status and authoritarian parenting, and this has recently been found to be a detriment to academic achievement among adolescents (Steinberg, Dornbusch, & Brown, 1992). High parental similarity on the CPI Tolerance scale among the exceptionally high-IQ parents and high parental similarity on the CPI Achievement through Conformance scale among the math-science parents each correlated with the sons' lower than cohort's creativity scores. When taken together, these results indicate that among exceptionally gifted 12-year-old boys, parental differences and intrafamilial stress have a greater capacity for potentiating a gifted boy's creativeness than parental trait similarity or high degrees of tolerance, acceptance, and conformity.

Early Family Environmental Presses

The concept and measurement of family environmental presses is drawn from Marjoribanks' (1979) *Family Environment Inventory*. Presses can be viewed as parents' internal motivations and, from the perspective of the child, environmental pressures. The implication, borne out by Marjoribanks (1979) and this study, is that families' parenting goals and efforts are far from random, instead pushing and guiding parent-child interactions along specific paths toward specific ends.

One very important way in which families can influence their gifted child's achievement is through an early awareness of the child's particular giftedness. Early identification, certainly no later than elementary school (Albert, 1978; Bloom, 1985; Robinson, 1981), can lead to early specialized interest and instruction, capitalizing on the child's own cognitive giftedness and identification with parents. Because it takes years of immersion for even the most gifted child to acquire the necessary levels of skill and knowledge to excel (Albert, 1992; Hayes, 1981; Walters & Gardner, 1986) early identification can be an asset to the child if he or she is not pushed by unreasonable parental demands (Montour, 1977). Giftedness,

especially exceptional giftedness, contributes to the selectivity of early experiences (Montour, 1977; Walmsley & Margolis, 1987). To the extent that our exceptionally gifted boys' families differ in key areas of personality values, emphases, and birth orders, it is likely that the early family lessons taught and the early experiences encouraged will also differ.

Two brief examples follow. The exceptionally high-IQ families—mothers and fathers—were significantly more involved with their sons on an everyday activities level. (As reported, these boys' test performances were much more open to their parents' influences than those of the math-science boys.) This high parental involvement was manifested in two ways—from the interview content and parents' higher scores on the presses for Activity, Independence, and Father and Mother Involvement. Families that stress activity emphasize involvement in such extracurricular pursuits as music, sports, languages, reading, and so on. The exceptionally high-IQ boys' parents were also significantly more involved with their sons' recreational activities, and equally important, they themselves took more courses outside of the home than did the math-science families.

Although the math-science parents were not as clearly involved in their sons' daily activities (and the sons recognized this to some extent, Runco & Albert, 1987), neither were they indifferent to their sons' potential. These families emphasized their sons' independence significantly more than the exceptionally high-IQ families did (Albert & Runco, 1989). Along with their strong press for independence, math-science families also emphasized their sons' achievement more than the exceptionally high-IQ families.

Certainly, these differences affect sons' creative potential, but only for the exceptionally high-IQ sample in which there were significant positive correlations between family presses and sons' BIC creativity scores and divergent thinking test scores. In contrast, there were *no* significant relationships among the math-science families' presses and their sons' creativity scores.

These family domain differences show up even more clearly in multiple regression analyses. Only 19.8% of the variance of the math-science boys' divergent thinking scores was associated with their family presses (Independence, Mother Involvement, and Father Involvement) but 55.1% of the variance in the exceptionally high-IQ boys' divergent thinking test scores was accounted for by their family presses (Intellectuality, Mother Involvement, and Achievement). The same clear domain differences hold true on the second measure of creative potential. A mere 9.8% of the variance for math-

science boys' BIC total scores (Art/Writing and Math/Science scales) is accounted for by their families' presses (Independence, Intellectuality and Father Involvement) compared to 50.3% for the exceptionally high-IQ boys' BIC score total scores (Father Involvement, Activity, and again Intellectuality). Not everything about these two samples of families differs, however: The presses of Father Involvement and Intellectuality contributed to both samples' creative potential, indicating that both groups' fathers were positively influencing their exceptionally gifted sons' intellectual efforts at a very strategic developmental stage.

In summary, one can say that the creative potential of the exceptionally high-IQ boys was more influenced than the math-science boys' by their families' presses for Intellectuality, Activity which implies initiative, Father Involvement, and by their fathers' own creativity measured by tests of divergent thinking. In the case of the math-science boys, the family presses for Independence and both parents' involvement along with their mothers' own creativity contributes to their early creative potential. Involvement of the father relates to creative potential in both samples at age 12.

Longitudinal Results

For all the questions raised and data collected at the beginning of the project, there were some unanticipated developments (Albert & Spangler, 1992). The first follow-up was conducted when the subjects were 16 years old. They were all asked many of the same questions as in the first data collection point about schooling, aspirations, potential careers, and the sources of important lessons for life. Many answers can be categorized as extremely concrete (e.g., "I like being at Hopkins") or extremely vague (e.g., "I guess I'll be a businessman." "I haven't thought much about it this year; I have exams coming up."). The item was useless in eliciting information, leading me to believe I was never going to learn much from these adolescents.

Four years later, however, I discovered that close to one-third of the young men in each sample had made educational and career decisions that were not predicted or even considered at the onset of the study. Even more surprising, these "crossovers" had changed, in their personalities and career aspirations, to now closely resemble the majority of boys in the other sample to which they crossed, for example, a shift from math-science to community medicine; from a business career to graduating from California Technological Insti-

tute. In college these boys had selected courses and careers that were much more aligned with and expressive of their age 22 personalities and interest than those at age 12.

In order to give the reader an appreciation of these unanticipated developments, we present some data regarding the crossovers and noncrossovers. As one might expect, it is easier to observe the crossovers among the math-science sample than those among the exceptionally high-IQ sample. Educational and career meandering and switches are far more common, accepted, and encouraged among liberal arts students. An equally gifted boy in mathematics, physics, or engineering usually experiences more curricular guidance and has more specific career choices put before him. To exit this track he must radically change. Inspection of the early test scores of crossovers shows that they were as gifted and creative as the rest of their sample who did not cross over. Therefore, it was not because a lack of cognitive or creative potential that they changed.

For most gifted persons, creativity, identity, and career choice come together during their late teens or early 20s, and these two samples are no exceptions. It was after the second (1988-1990) follow-up study that the changes appeared. Analyses focused on the subjects' age 22 "Adjective Check List" personality profiles, their age 12 and 22 ego developments according to the Loevinger Sentence Completion Test, and their parents' when their sons were age 12, Vaillant's Early Childhood Environment Scales, and their Bond-Vaillant Defense Style Questionnaire results. Only results on the personality profiles of crossovers and noncrossovers and their early home environments will be presented. More details can be found in Albert and Spangler (1992).

Once the crossover/noncrossover phenomenon was discovered, and before the data were coded and analyzed, Albert and Spangler (1992) derived some hypotheses regarding them. In each sample, the personalities of crossovers differed significantly from that of noncrossovers. Although these changes took place within a 10-year period, one would expect that it is probably a more difficult change for math-science boys to crossover than for the exceptionally high-IQ boys. We see evidence of this in the tables. Math-science crossovers are significantly more dominant, attracted to novelty and change, autonomous and self-willed, assertive, and more of a free child. Not only do the math-science crossovers show more of a creative personality (ACL scale 25), but they indicated more self-assertion and intrinsic motivation than the exceptionally high-IQ crossovers.

Regardless of other considerations at this time, these are substantial personality differences, and they raise questions about their

Table 11.2. Adjective Check List Scales Applied to Hypotheses with Major Descriptors

Behavior Style	
(Dom) Dominance	"behaves in an assertive fashion," "emphasizes being with others; gregarious," "Is power-oriented; values power in self or others."
(End) Endurance	not "conservative"; "persist in any task undertaken," is "curious."
(Ord) Order	emphasizes "neatness," "organization," "routine," "conventional."
(Cha) Change	emphasizes "seeks novelty of experience and avoid routine"; "characteristically pushes and tries to stretch limits."
(CPS) Creative Personality Scale	"adventurous," "genuinely values intellectual and cognitive matters," "interests wide"; not "timed."
(A-2) High Origence High Intelligence	"high value placed on both affect (origence) and rationality (intellectence). High scores suggest versatility, unconventionality and individuality."
Motivational Needs	
(Ach) Achievement	"ambitious," ". . . determined to do well and usually does."
(Int) Intraception	"Genuinely values intellectual and cognitive matters," does not "give up and withdraw where possible in the face of frustration and adversity."
(Aut) Autonomy	"egotistical," "independent and autonomous but also assertive and self-willed."
Self-Image Reported	
(S-Cfd) Self Confidence	"behaves in an assertive fashion," "has a high aspiration level for self."
(P-Adj) Personal Adjustment	"energetic," "self-confident"; not "apathetic," not "timid" or "withdrawn."
(Iss) Ideal Self Scale	"Has a wide range of interests," "Is productive," ". . . elements of narcissistic ego inflations."
(Mas) Masculine Attributes Scale	"forceful," not "submissive," "self-confident," "initiative."
(Fem) Feminine Attributes Scale	"adaptable," "appreciative," not "defensive" or "fault-finding."
Transactional Analysis Scales: Predominate Child	
(FCS) Free Child Scale	"daring," "enterprising," "pleasure-seeking," "versatile."
(ACS) Adapted Child Scale	"experiences great difficulty in setting aside subordinate childhood roles"; is "very dutiful" is not "argumentative" and "determined."

Note: All descriptions are drawn from either *The Adjective Check List Manual* (1983) or *The Adjective Check List* of standard scales. Categories are Albert and Runco's.

Table 11.3. Hypotheses, Means, Standard Deviations, and t-values: *Math-Science* Crossovers and Non-Crossovers On Specific Adjective Check List (ACL)

	Math/Science Crossovers		Math/Science Noncrossovers		
	M	S.D.	M	S.D.	t-value
Behavioral Style					
Dom	58.33	(5.29)	45.86	(11.25)	3.10*
End	45.78	(7.29)	48.33	(9.10)	.71
Ord	44.44	(8.68)	48.73	(9.72)	1.09
Cha	57.89	(7.91)	50.33	(10.97)	1.80*
CPS	64.67	(5.45)	54.13	(10.58)	2.75**
A-2	55.33	(7.14)	51.93	(10.53)	.85
Motivational Needs					
Ach	52.44	(6.77)	47.73	(9.97)	1.25
Int	51.22	(8.70)	52.60	(8.77)	.37
Aut	59.89	(7.01)	51.67	(10.61)	2.13*
Self-Image Reported					
S-Cfd	58.56	(5.15)	47.13	(10.11)	3.14**
P-Adj	51.78	(6.24)	48.67	(10.03)	.83[A]
Iss	56.56	(9.81)	48.40	(11.14)	1.81*
Mas	53.55	(5.46)	48.20	(12.15)	1.24[A]
Fem	44.11	(9.88)	49.07	(9.36)	1.23
Predominant Child					
FC	62.00	(10.98)	47.87	(10.71)	3.10**
AC	44.56	(5.08)	50.53	(10.25)	1.62

Note: All significant mean difference are in hypothesized direction
A = Difference not significant, hypothesis confirmed.
*1 - tail p-value ≤ .05 **1-tail p-value ≤ .01
Adapted from Albert & Spangler, 1992.

Table 11.4. Hypotheses, Means, Standard Deviations, and t-values: *Exceptionally High-IQ* Crossovers and Noncrossovers on Specific ACL Scales

	Expt-High IQ Crossovers		Expt-High IQ Noncrossovers		
	M	S.D.	M	S.D.	t-value
Dom	47.00	(5.43)	50.80	(14.08)	.56[A]
End	54.00	(4.06)	37.40	(6.39)	4.90**
Ord	54.20	(5.93)	37.80	(6.76)	4.08**
Cha	45.00	(6.82)	62.60	(6.07)	4.31[B]
CPS	53.60	(9.40)	60.40	(9.13)	1.16[A]
A-2	56.60	(10.43)	61.60	(4.04)	1.00
Ach	48.60	(3.58)	44.20	(9.83)	.94[A]
Int	49.60	(13.24)	45.40	(5.13)	.66
Aut	48.80	(12.66)	60.80	(6.38)	1.89*

Table 11.5. Hypotheses, Means, Standard Deviations, and T-values Between *Two Samples'* Crossovers on Specific Adjective Check List (ACL) Scales Crossovers

ACL Scale	Hypotheses Tested	Math-Science M	Math-Science S.D.	Excpt. High IQ M	Excpt. High IQ S.D.	t-value
Dom	Math-Science *higher* than Excpt. High IQ	58.33	(5.29)	47.00	(5.43)	3.81**
End	Excpt. High IQ *higher* than Math-Science	45.78	(7.29)	54.00	(4.06)	2.30*
Ord	Excpt. High IQ *higher* than Math-Science	44.44	(8.68)	54.20	(5.93)	2.22*
Cha	*No* difference between the subgroups	57.89	(7.91)	45.00	(6.82)	3.05**B
CPS	*No* difference between the subgroups	64.67	(5.45)	53.60	(.40)	2.83*B
A2	*No* difference between the subgroups	55.33	(7.14)	56.60	(10.43)	.27A
Motivational Needs						
Ach	*No* difference between the subgroups	52.44	(6.77)	48.60	(3.58)	1.17A
Int	*No* difference between the subgroups	51.22	(8.70)	49.60	(13.24)	.28A
Aut	Math-Science *higher* than excpt. High IQ	59.89	(7.01)	48.80	(12.66)	2.14*
Self Image						
S-cfd	Math-Science *higher* than Excpt. High IQ	58.56	(5.15)	44.80	(4.55)	4.97**
P-adj	*No* difference between the subgroups	51.78	(6.24)	42.80	(12.03)	1.87A
ISS	*No* difference between the subgroups	56.56	(9.81)	55.60	(10.78)	.17A
MAS	*No* difference between the subgroups	53.55	(5.46)	48.20	(7.12)	1.58A
Fem	*No* difference between the subgroups	44.11	(9.88)	45.40	(11.78)	.22A
Predominate Child						
FC	Math-Science *higher* than Excpt High IQ	62.00	(10.98)	45.00	(5.24)	3.22**
AC	Excpt. High IQ *higher* than Math-Science	44.56	(5.08)	50.20	(7.43)	1.70

antecedents. Looking at their age 12 data, the crossovers' ego development and early home environments are congruent with these changes. Their age 12-22 ego development was much greater and toward more independence than that for their noncrossover co-

horts. At age 12 there was no significant difference between the ego development stages of the two groups, both being between a highly conformist stage and one in which there is a sense of one's self as independent of others. (See Hauser, 1991; Loevinger & Wessler, 1970, for some of the behavioral and developmental ramifications of these stages.) When parents' levels of ego development were examined, as one would expect, they were significantly higher (more developed) than their sons' ($p = .03$), but there were no significant differences between the two samples of mothers or fathers. It is the magnitude of the math-science crossovers' ego development over the 10 years that is most striking.

Just how much the math-science crossovers had changed can be seen when they are compared to the change of exceptionally high-IQ crossovers and noncrossovers. At age 12, the math-science crossovers' level of ego development was lower than either of the exceptionally high-IQ subgroups ($p = < .05$). But by age 22, the math-science crossovers had moved from being primarily self-protective and wary of other persons' blame and control to an individualistic stage in which the self is the guide and decision maker ($p = .02$); their level of ego development was now equal to that of the exceptionally high-IQ crossovers, who also had moved up in their ego development. What makes these changes thought-provoking, is that noncrossovers in both samples showed hardly any change in their levels of ego development between the ages of 12 and 22. This makes sense. These boys had to change little in order to stay on their early career paths. Whatever in their development had put them there in the early years was still sufficient and applicable at age 22.

Needless to say, the data have shown that the subjects' families are involved. There are significant linkages between parents' own levels of ego development and the degree of early home environmental support given to the son and his subsequent development. Both have significant positive bearings on a son's own continued development.

CONCLUSION

To some extent, two of the project's early questions have been answered: There are definitely domain differences in exceptional giftedness; early cognitive giftedness is at best a necessary but far from sufficient agent in subsequent personal development and career choice among exceptionally gifted boys. What is also clear is that much of their early ego development, creative potential, and later

personality changes are related to their parents' personalities, levels of creative potential, and ego development, and the specific family presses these boys had experienced.

By using standard measures of personality, ego development, family presses, cognitive and creative performances over time, the project has demonstrated that it is possible to locate, distinguish, and document developmentally significant differences within and between two samples of exceptionally gifted boys and their parents. Equally important, is the evidence (both direct and indirect) that the degree of intrafamily stress, the presence of parental differences, and the quality of father-son relationships are important in potentiating these boys' creative and educational potential. Furthermore, the high degree of creativity that other research has reported in families of eminence-achieving persons occurs within these families as well. This is evidence that these exceptionally gifted boys did not start at ground zero in their own creative potential or efforts. Families are not only launching pads but can fuel their sons' later creativeness. This should alert and encourage parents and educators to their own contributions to the development of potential. Neither a high-IQ nor a talented math-science boy is a better candidate for eminence, because it is the "fit" between the candidate and his career that matters (Albert, 1992).

What Is It About Longitudinal Research That Is So Gripping?

The power, the problems—many logistical—and the risks of longitudinal research have become increasingly evident as time goes by. Many are spelled out in this volume. But there is one aspect not often discussed that is highly influential in longitudinal research—perhaps more than in other designs. This has to do with the fit that must exist between the investigators and the primary content and goals of their projects. Possibly more than any other type of research design, longitudinal research is a statement of the researcher's own sense of self, career purpose, and intellectual passion. How else could anyone devote so much of his or her lifetime to one set of people, purposes, and questions? My own experiences tell me that longitudinal research is a professional statement that over time becomes a personal definition. Sooner or later longitudinal research is as much an act of personal commitment as it is of pure science, fulfilling one basic requirement for a creative life which is the meshing of knowledge, purpose, and emotion in the individual making

the effort. Once in, never out; and once underway, the project and those personal relationships that make it up, and upon which its continuance relies, can take on lives of their own. Naturally, they change, as most enduring relationships do. But it is critical for anyone who anticipates designing and conducting longitudinal research to consider their own motivations and interests, because there is a degree of private and interpersonal commitment, engagement, and responsibility that is not always present in other research designs.

Some time ago it was reported that the participants were far from set in their ways (Albert & Runco, 1986). Now we see developmental changes and variety within and between the samples. Whatever these young men's subsequent and final destinations, it should be underscored that much of the data and outcomes emerged from the project's longitudinal perspective and multifaceted methodology. The third follow-up began Fall 1992, when according to other evidence (Albert, 1975; Cox, 1926; Raskin, 1936; Simonton, 1984) signs of eminence should appear.

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