

YEAR-BY-YEAR CHANGES IN PERSONALITY FROM SIX TO EIGHTEEN YEARS¹

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ABSTRACT

Teacher trait-ratings on 42 bipolar traits were obtained for 650 school children (25 boys and 25 girls from Kindergarten through Grade 12). The trait-ratings were transformed into factor scores on Cattell's 15 basic personality factors. Year-by-year cross-sectional analysis of the trait-ratings and factor scores yielded significant sex and age differences throughout the school age period.

A number of different approaches may be taken to the objective study of personality development. Within the strictly longitudinal approach (exemplified by the Fels studies; see Kagan and Moss, 1962), one may compute correlations between measures taken at different points of time in the life-cycle, examining thereby the stability of certain processes, traits, or dynamic functions. Alternatively, the development of such processes in general may be examined by studying trend-lines over age-periods. Using a cross-sectional approach, subjects taken at different ages are assumed similar in other respects. While correlations between different age-groups cannot be computed, trend-lines over age-periods can be examined. In recent years far more complex mathematical models of studying growth and change have been developed (see, for example, Harris 1963; Tucker, 1965; Horn and Little, 1966).

The present research is conceived in continuity with the cross-sectional trend-line approach. This approach has been most extensively used by Cattell and his associates (Cattell and Coan, 1957a,b; Coan and Cattell, 1958; Cattell, Coan and Beloff, 1959). In these studies factor patterns of ratings and questionnaires were examined for continuity over the age-periods studied (middle-childhood and high-school age), and in comparison with factor patterns obtained for adults (Cattell, 1957). In the latter source, Cattell has offered trend-lines for objective test factors measured in children ages nine through sixteen. In general, controls and alertness increase steadily over this interval (Will Control, Inhibition, Neural Reserves, Comention, Corticalertia) while Exuberance decreases. Critical Practicality and Immediate Overresponsiveness increase up to 11½ years and then level off.

Systematic examination of year-to-year changes in the several studies mentioned above has been hampered by the fact that different instruments were employed at the different age-periods. The concept of age-period itself, of course, is an honored one. Mussen, Conger and Kagan (1963), for example, organize their book on

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child development around the period concept: preschool, middle-childhood, etc. The techniques of investigation of these several periods have most commonly been different, techniques or instruments appropriate for one period not necessarily being appropriate for other periods (compare the use of verbal questionnaires designed for adults with the means necessary to obtain comparable information from preschool children!). For this reason, Cattell and his associates have sought to go beyond the particular instruments and focus upon underlying factors of personality, measurable by whatever devices are in fact appropriate for the given age-period. What is sought is conceptual continuity despite instrumental diversity. However, it is in fact extremely difficult to be sure that identity of factorial structure and of particular factors has been obtained when different devices have been used to obtain the raw measurements. The one device that does give promise of true identity over different age-periods is that of ratings. In fact, between the ages of five or six and seventeen or eighteen (later still in college, of course), it is possible to obtain ratings from comparable observers, namely the children's teachers.

Typically, in the above-mentioned studies, focus has been directed toward establishment of comparable factor structures at the different age-periods. There is another important difficulty with such structures however, namely that there may well be marked variations from year to year *within* the period. For example, Mussen, Conger and Kagan (1963, p. 357) point out that although middle-childhood is conceived as a unitary period and treated as such, its years from six to twelve could usefully be split into two periods: five through nine and nine through twelve. From the point of view of factor structures, it is perhaps necessary in fact to conduct separate studies at each of these two sub-periods, or perhaps at each year.

Another point of substantial importance is that of sex-differences. In the above-mentioned studies, attention to sex-differences has been scant, on the assumption that such differences will show up largely in differences of level or mean score upon factors, not in differences of factors as such. However, there is ample evidence that the course of development (of passivity or aggression for instance; see Kagan and Moss, 1962) differs for boys and girls. Mussen, Conger and Kagan (1963) give extensive treatment of sex differences throughout their text. Terman and Miles (1936) provided an early general and fundamental treatment of sex differences in personality.

The present study, then, attempts to provide some preliminary basic data upon the course of development of certain personality factors, year by year, from age six through age eighteen, for males and for females separately. Certain compromises and limiting assumptions are accepted. First, it is assumed that factor structures are relatively constant over the years. Though there is evidence for this assumption, there is also evidence against it, depending

upon the particular "structure" concerned. While Cattell and his associates have generally adduced evidence for stability over ages of Cattell's fifteen personality factor structure (Cattell, 1957), one of his associates found evidence which suggested first that a two-factor structure (General Adjustment and Extroversion-Introversion) was superior structurally; second that such a structure showed better evidence of generality over ages (Peterson, 1960). Digman (1963) again found evidence suggesting that a two- or three-factor structure should be identified with second-order analysis; while at the first order he found a structure of eleven factors.

Despite the obvious difficulties of decision here, due to the variations in items, rotation methods, and order of analysis, the present work is based upon the assumption that the fifteen personality factor structure obtained by Cattell provides a stable basis for organizing trait ratings. Moreover, it is also the case that the particular traits upon which Cattell's work has been carried out have had the most careful derivation and the most widespread application. It is Cattell's set of 42 trait descriptions that were therefore used in the present ratings. Since the identical set of rating items is used at all ages there can be no doubt about *their* stability.

PROCEDURE

A personality trait-rating scale was developed by adapting descriptions given by Cattell (1957) for his "normal personality sphere." A booklet of 42 bi-polar trait-descriptions was made up, positive and negative poles being randomly assigned. Each rater was required to rate his subjects on a three-point scale, indicating by his rating whether one of the poles was more representative of his subject, or by using the indifference point, when neither pole was applicable. Each pole was anchored by a descriptive paragraph to ensure greater rater reliability. The summary adjectives describing the poles are listed in Table 1.

Subjects (N=650) were obtained from the Lincoln Nebraska Public Schools. Twenty-five boys and 25 girls were randomly selected in each grade from Kindergarten to Grade XII. Because of the nature of the local school system, children were selected from one grade school (grades Kindergarten through VI), a junior high (grades VII to IX) and a senior high school (grades X to XII). The schools were selected so as to obtain the broadest socio-economic coverage. There may be some slight differences in average socio-economic status, but these are not considered large enough to be of over-riding importance. Each subject was rated on the 42-item trait scale by his home-room or guidance teacher. Two or more raters were employed for each grade, and each rater rated both male and female subjects. The rating procedure took place in late Spring, so that each teacher had had opportunity to become acquainted with his subjects for at least a six-month period.

RESULTS

Reliability of trait ratings. The reliability of the ratings was investigated by drawing ten eighth grade students at random, and

Table 1
Analysis of Variance of Age and Sex Differences in
Teacher Trait Ratings (N = 650; 25 Ss per cell)

Trait	Age		Sex		Interaction		Residual ^a
	MS	F	MS	F	MS	F	MS
1. Considerate-Inconsiderate	.46		24.03	42.16**	.58		.57
2. Calm-Excitable	1.69	2.25**	3.12	4.16*	.67		.75
3. Energetic-Tired	1.80	2.69**	1.77		.99		.67
4. Quiet-Noisy	1.58	2.43**	18.27	28.11**	.45		.65
5. Patient-Impatient	.82		18.28	30.98**	.29		.59
6. Cheerful-Solemn	3.51	5.59**	1.99		.75		.59
7. Friendly-Reserved	1.37	2.08*	3.26	4.94*	1.11		.66
8. Meditative-							
Unquestioning	.68		2.58	4.45*	1.04	1.77*	.58
9. Cooperative-Obstructive	1.09	3.41**	11.38	35.56**	.47		.32
10. Happy-Sad	1.66	3.77**	4.16	9.45**	.49		.44
11. Sensitive-Tough	1.77	4.92**	9.36	26.00**	.55		.36
12. Intelligent-Stupid	1.88	3.76**	3.85	7.70**	.46		.50
13. Poised-Flustered	1.71	3.17**	10.60	19.62**	.86		.54
14. Tolerant-Jealous	.92	2.19*	2.71	6.45*	.41		.42
15. Dominant-Submissive	1.04	1.89*	3.84	6.98**	.38		.55
16. Relaxed-Tense	.79		2.58	4.37*	.80		.59
17. Conventional-							
Unconventional	1.86	3.96**	6.30	13.40**	.61		.47
18. Sociable-Selfcontained	2.19	3.53**	.01		.50		.62
19. Trustful-Suspicious	.89	1.89*	.35		.61		.47
20. Selfeffacing-Egotistical	1.30	3.17**	7.11	17.34**	.25		.41
21. Conscientious-							
Unscrupulous	1.66	4.49**	13.60	36.76**	.21		.37
22. Adventurous-Timid	.72		13.02	18.33**	.84		.71
23. Stable-Unstable	1.53	2.51**	8.66	14.20**	1.09	1.79*	.61
24. Persevering-Quitting	1.41	2.39**	21.79	36.93**	.97		.59
25. Modest-Attentionseeking	2.32	4.38**	16.97	32.02**	.59		.53
26. Open-Defensive	.88		1.29		.91		.55
27. Refined-Crude	1.11	3.08**	28.46	79.06**	.46		.36
28. Imaginative-Practical	1.83	3.33**	.12		.79		.55
29. Obedient-Disobedient	.84	2.00*	14.77	35.17**	.60		.42
30. Adaptable-Inflexible	1.06	2.41**	4.49	10.20**	.46		.44
31. Responsible-							
Irresponsible	1.72	2.77**	15.69	25.31**	.20		.62
32. Curious-Incurious	1.32	2.59**	.39		.37		.51
33. Talkative-Silent	1.26		1.30		1.06		.74
34. Carefree-Anxious	.73		.31		.68		.51
35. Tasteful-Inartistic	1.62	4.05**	11.91	29.78**	.55		.40
36. Resourceful-Baffled	.92		4.82	8.31**	.82		.58
37. Independent-Dependent	2.26	3.83**	2.11		.67		.59
38. Adult-Naive	2.07	3.98**	5.00	9.62**	.52		.52
39. Orderly-Disorderly	1.23	2.24**	20.70	37.64**	.93		.55
40. Easygoing-Irritable	1.16	2.58**	4.65	10.33**	.70		.45
41. Expressive-Secretive	1.02	1.92*	.16		.59		.53
42. Brave-Complaining	3.02	7.95**	.62		.32		.38

^aSince the main variables are fixed constants, the residual variance becomes the appropriate error term. F ratios are evaluated with 12 and 624 *df* for age; 1 and 624 *df* for sex; and 12 and 624 *df* for the interaction term.

*Significant at or beyond the 5% level of confidence.

**Significant at or beyond the 1% level of confidence.

having two guidance teachers, who knew the subjects about equally well, do independent ratings. Of the 420 ratings 64% showed perfect agreement, in 24% one rater checked the neutral point where the other rater had checked a trait end, while in 12% of the ratings there was disagreement between raters. An analysis of variance check failed to allow rejection of the null hypothesis as to differences between raters at or beyond the 1% level of confidence. The reliability coefficient yielded by the analysis of variance was .93 when trait differences as well as individual x trait and rater x trait interactions were removed. A more conservative estimate, considering only overall differences between individuals and raters, yielded a coefficient of .72. These values were deemed acceptable for purposes of the present nomothetic research.

Age differences in the trait ratings. Although the trait ratings were rather gross because of the 3-point scale used, it is of interest to examine the age differences on group means for the separate traits before combining them. The analysis of variance was used to test hypotheses as to age and sex differences for each of the traits rated. Results are summarized in Table 1. Significant sex differences are found for thirty traits, but one of the most striking findings is the fact that girls are rated with significantly higher frequency towards the more "socially desirable" pole of every trait except "dominant-submissive" and "adventurous-timid."

Significant age differences are found for 34 traits, but the interaction between sex and age is significant only for "meditative-unquestioning" and "stable-unstable." Except for these two traits the growth-curves for boys and girls have similar shapes. It is of interest that the hypothesis of linearity is not tenable for any trait where age differences are found to be significant. Growth functions for these traits appear to be complex, and no single equation could be considered typical for their description. No further descriptions of the individual trait-ratings are given here, however, as the principal interest is focused at present upon the combination of these raw data in factor-score form.

The fifteen personality factor scores. Scores on fifteen personality factors (Cattell's factors A through O) were obtained by combining the trait-ratings, assigning unit weight on each factor to those traits which were considered to have a significant factor loading in Cattell's factor analysis of ratings on adults (1957). The factor weights are listed in Table 2. Means and standard deviations were computed for the total group of 650 subjects to obtain a reasonably stable point of reference for the sub-group comparisons.

Means for the different age-groups, separately computed for boys and girls, are presented in Tables 3 and 4. These means are expressed in standard-score form, with a mean of 50 and a standard deviation of 10, using the total group as point of reference. They are thus comparable among groups as well as personality factors. A difference between sub-group means of 5.7 standard

Table 2
Factor Weights Assigned to Trait Ratings for
Computing Factor Scores

Trait	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1. Considerate-Inconsiderate					-1		1						-1		
2. Calm-Excitable	1			-1		1									
3. Energetic-Tired					-1	1				-1					
4. Quiet-Noisy					-1		-1								
5. Patient-Impatient				-1				-1							
6. Cheerful-Solemn	1				-1										
7. Friendly-Reserved	1				-1										-1
8. Meditative-Unquestioning		1						1		1					
9. Cooperative-Obstructive						1				-1					
10. Happy-Sad									1						-1
11. Sensitive-Tough															1
12. Intelligent-Stupid		1													
13. Poised-Flustered											1				
14. Tolerant-Jealous					-1							-1			
15. Dominant-Submissive		1								-1					
16. Relaxed-Tense			1										1		
17. Conventional-Unconventional									1	-1			-1		
18. Sociable-Self-contained															1
19. Trustful-Suspicious															-1
20. Selfeffacing-Egotistical	1				-1										
21. Conscientious-Unscrupulous	1				-1										

Table 3
Mean Standard Scores for Boys in each Age Group on the Fifteen Basic Personality Factors (N = 25 each; reference group: total sample, N = 650)

Factor	Age												
	6	7	8	9	10	11	12	13	14	15	16	17	18
A	47.8	47.7	52.3	51.4	44.5	47.6	49.0	46.8	48.7	48.2	46.2	46.0	52.4
B	48.0	49.3	52.2	48.7	49.1	46.2	49.7	47.4	51.3	49.1	46.0	48.0	49.5
C	45.2	45.3	52.4	49.1	43.1	48.9	49.5	44.6	50.1	50.8	48.9	45.7	48.2
D	55.5	52.5	49.4	41.5	57.3	53.7	51.0	55.3	50.9	49.9	40.2	44.0	49.5
E	57.9	54.2	41.9	52.4	56.4	50.8	53.0	56.3	52.5	51.6	52.0	50.2	48.7
F	47.8	48.3	54.7	49.9	46.7	50.3	48.2	48.7	48.5	47.9	45.9	46.1	50.2
G	45.1	46.1	50.8	48.5	44.3	46.6	49.2	43.5	50.4	48.3	47.0	45.7	48.3
H	53.8	51.2	54.7	51.1	52.0	47.9	52.6	53.7	50.0	49.0	46.0	48.6	48.9
I	51.2	51.2	47.6	48.2	53.9	53.5	50.1	53.1	49.0	48.4	46.9	48.4	48.4
J	50.8	52.1	47.9	49.4	51.6	46.4	49.7	54.2	48.4	40.6	53.7	49.8	51.9
K	45.0	43.8	51.1	48.7	44.7	52.4	51.3	46.9	49.2	53.0	43.5	45.6	44.7
L	51.2	51.2	48.8	45.5	55.9	52.4	50.8	54.1	52.0	51.0	52.9	53.1	48.6
M	53.1	48.8	51.6	50.5	47.4	51.0	51.2	47.1	50.3	49.9	51.6	49.9	49.7
N	46.8	46.0	51.9	48.5	47.0	52.6	52.3	43.4	49.8	44.4	44.1	49.1	47.5
O	52.1	52.1	46.3	46.3	53.9	51.5	48.1	53.2	50.3	55.9	49.2	52.6	47.0

score points is significant at the 5% level and of 7.6 standard score points at the 1% level of confidence.

The analysis of variance was used to test the null hypothesis with respect to age and sex differences separately for each of the fifteen factors. Results of these analyses are presented in Table 5. It appears that the null hypothesis may be rejected with respect to age for all personality factors except B (Intelligence), G (Superego strength), I (Premsia vs. Harria) and M (Autia vs. Praxernia). The null hypothesis with respect to sex may be rejected for all personality factors except H (Parmia vs. Threctia), I (Premsia vs. Harria), J (Coasthenia), M (Autia vs. Praxernia) and O (Guilt proneness vs. Confidence). The null hypothesis fails

Table 4
Mean Standard Scores for Girls in each Age Group on the Fifteen Basic Personality Factors (N = 25 each; reference group; total sample, N = 650)

Factor	Age												
	6	7	8	9	10	11	12	13	14	15	16	17	18
A	49.2	53.9	52.7	52.2	48.5	51.6	52.1	55.3	46.6	50.0	51.6	51.8	56.3
B	48.9	53.0	54.0	52.8	48.7	54.2	50.5	47.0	48.9	47.2	55.5	53.6	50.9
C	48.8	51.5	55.8	52.9	46.2	56.0	53.6	53.5	48.2	50.5	52.4	50.6	51.6
D	51.5	48.2	43.3	47.3	50.2	46.9	46.7	46.6	50.3	47.9	46.2	48.1	44.3
E	51.3	47.0	43.9	48.6	48.9	46.1	47.3	45.7	48.1	46.6	48.7	45.4	44.3
F	49.6	55.3	54.8	52.8	48.5	40.8	51.6	52.0	44.9	48.0	51.3	52.1	55.3
G	48.9	53.8	55.9	51.9	50.6	55.1	54.7	52.8	50.2	52.4	54.2	52.3	53.2
H	51.2	52.1	50.4	51.5	49.5	49.7	48.6	50.6	42.9	47.9	49.5	48.7	48.1
I	47.6	52.2	46.1	47.1	49.7	50.1	48.6	47.4	55.4	50.9	50.5	50.9	53.7
J	51.1	46.6	47.1	48.0	54.3	47.9	46.0	53.2	54.2	49.0	49.5	47.8	48.9
K	46.3	51.9	53.7	51.6	49.6	59.1	54.8	53.3	52.7	51.5	54.2	51.0	49.9
L	53.3	45.7	48.2	46.9	50.0	47.3	48.2	48.0	51.6	49.0	49.8	46.3	46.1
M	51.0	47.8	48.8	52.7	46.3	53.5	53.1	48.2	51.2	47.6	50.3	48.8	48.2
N	45.9	51.4	55.5	52.7	49.8	58.2	59.1	51.8	48.3	51.9	50.6	53.1	48.6
O	51.9	48.5	46.5	46.5	51.5	47.0	48.1	47.4	55.9	51.0	49.9	49.7	46.8

to be rejected for the sex-by-age interaction for all factors except I (Premsia vs. Harria). These results suggest important age or sex differences on all basic personality factors except factor M.²

Table 5
Analyses of Variance Testing the Hypotheses
of Age and Sex Differences for Factors A to O
(N = 650; 25 Ss per cell)

Factor	Age		Sex		Interaction		Residual ^a MS
	MS	F	MS	F	MS	F	
A: Cyclothymia vs. Schizothymia	27.30	2.34**	218.66	18.76**	12.38		11.65
B: Intelligence	4.92		38.41	9.23**	7.05		4.16
C: Ego-strength vs. Proneness to neuroticism	55.93	3.21**	443.65	25.44**	18.26		17.44
D: Excitability vs. Insecurity	30.48	2.72**	503.36	44.94**	7.45		11.20
E: Dominance vs. Submissiveness	38.46	2.55**	936.00	61.99**	8.91		15.10
F: Surgency vs. Desurgency	38.30	2.68**	164.50	11.51**	16.05		14.29
G: Super-Ego Strength	17.45		572.46	54.93**	8.92		10.42
H: Parmia vs. Threctia	27.38	2.06*	44.98		14.04		13.32
I: Premsia vs. Harria	4.99		.01		36.54	10.41**	3.51
J: Coasthenia	13.06	2.15*	10.10		7.15		6.07
K: Comention vs. Abcultion	27.62	4.59**	234.00	38.87**	8.31		6.02
L: Protension vs. Inner Relaxation	7.67	2.07*	44.46	12.02**	4.34		3.70
M: Autia vs. Praxernia	7.37		.89		1.88		4.45
N: Shrewdness vs. Naivete	28.58	5.44**	164.51	31.33**	7.38		5.25
O: Guilt Proneness vs. Confidence	9.91	3.25**	9.85		3.75		3.05

^aSince the main variables are fixed constants, the residual variance becomes the appropriate error term. F ratios are evaluated with 12 and 624 *df* for age; 1 and 624 *df* for Sex; and 12 and 624 *df* for the interaction term.

*Significant at or beyond the 5% level of confidence.

**Significant at or beyond the 1% level of confidence.

Examination of maturational gradients for sex differences shows that these gradients in general appear to coincide in shape but differ in level. In spite of this inter-sex consistency of gradient shape, peaks as well as low points for the different factors occur at different ages depending upon the sex of the subjects. These findings will be demonstrated by examining three typical factor age-gradients, selected because they illustrate different points.

The analysis of variance for Factor A resulted in significant

2. It is of interest to note that this factor could be located only with difficulty in the factorial studies of child behavior ratings. Similarly Factor I which shows significant age/sex interaction, but no sex or age differences, appears to be quite elusive in Cattell's researches.

age and sex differences. Examination of Figure 1 suggests that the girls were found to be more outgoing than the boys at all ages except age 14; that there is a tendency for an age-linked move in the cyclothymic direction; but also that there are periods in the developmental scheme where a reversal in the schizothymic direction is seen. For the girls there is a tendency to be rated increasingly reserved during the period 7 to 10, then a rise in the outgoing direction to age 13, a marked drop in the schizothymic direction at 14, and from then on a straight positive slope in the cyclothymic direction. For the boys there is a similar early schizothymic trend, except that it covers the period 8 to 10, followed by a slight rise to age 12 and a subsequent modest negative slope through age 17, with a final marked increment at age 18. These findings might point to a prepubertal crisis for both boys and girls at age 10, at least as far as tendency in the schizothymic direction is concerned. Recovery is more marked for the girls, with another pubertal schizothymic trend at age 14.

Factor E, whose age gradient is shown in Figure 2, also showed both significant age and sex difference. There is a general trend towards the submissive end of the continuum. The girls show an early submissive peak at age 8, somewhat of an increase in dominance for ages 10 to 11 with a plateau to about age 16, and a subsequent further move in the submissive direction. The gradient for the boys shows more marked negative slope, which is interrupted at ages 10 and 13.

Figure 3 illustrates the one factor (I) showing significant age-by-sex interaction. The girls showed a general trend in the "tender-minded" direction. However, from ages 6 to 13 girls are equally or more "tough-minded" than the boys, while the converse holds true for ages 14 to 18. There is an early "tender" peak for girls at age 7 with a more pronounced peak at age 14. The boys'

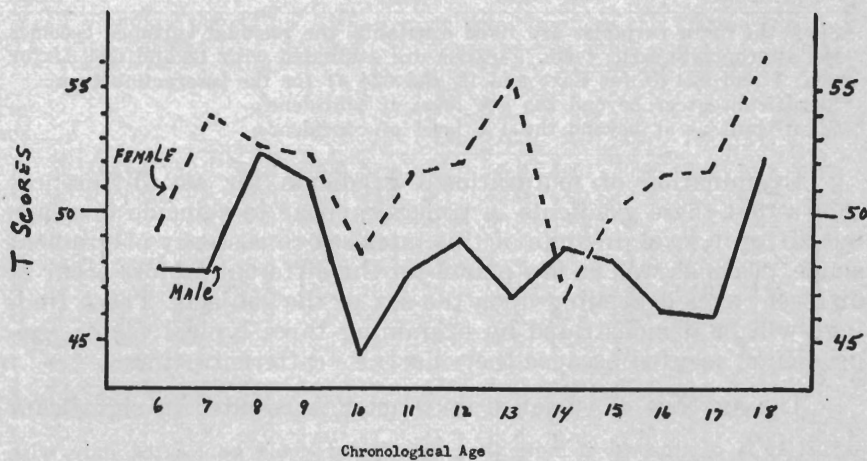


Fig. 1. Factor A: Cyclothymia vs. Schizothymia; trend-lines over age for males and for females separately.

gradient looks slightly negative towards the "tough-minded" direction. However, there is tendency towards "tough" at ages 8 and 9, with a subsequent move towards the "tender" end from ages 10 to 14, and with a subsequent move again in the "tough-minded" direction.

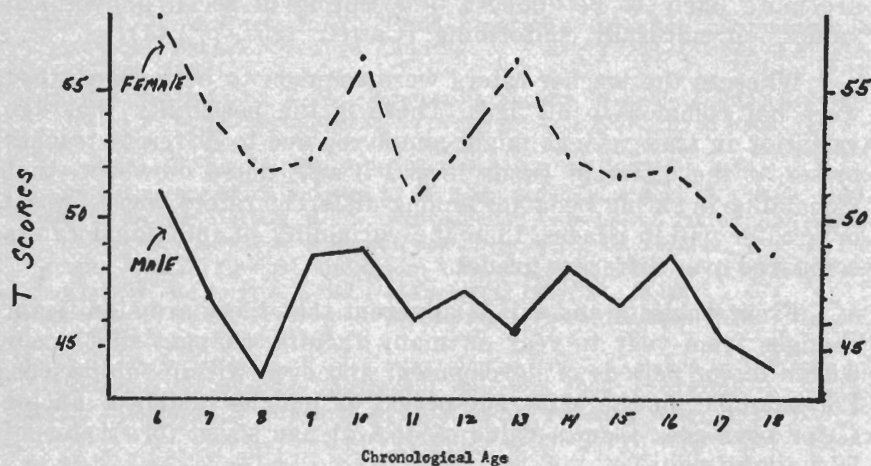


Fig. 2. Factor E: Dominance vs. Submissiveness; trend-lines over age for males and for females separately.

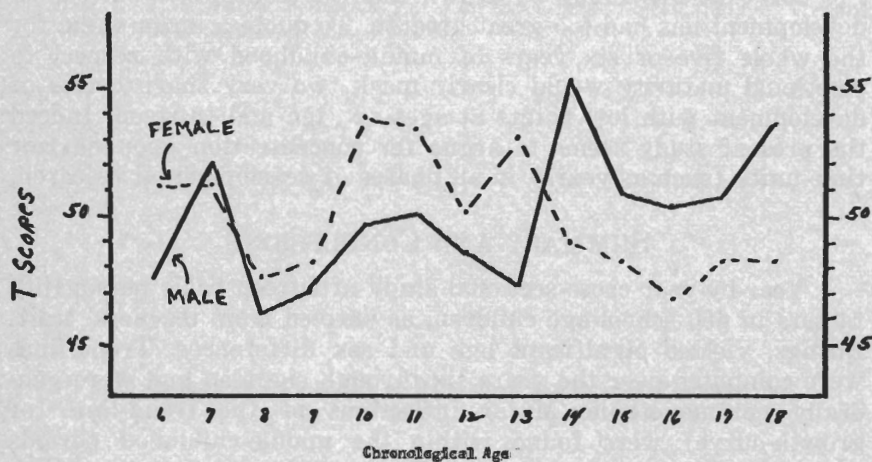


Fig. 3. Factor I: Premsia vs. Harria; trend-lines over age for males and for females separately.

DISCUSSION

It is possible that the overall sex differences may be a function of a general teacher bias in systematically assigning more socially desirable trait-ratings to their female pupils. Nevertheless, such systematic attributions of more favorable personality traits is meaningful in that it indicates differential judgment of personality

traits depending upon the subject's sex, and must be recognized in any attempt to standardize rating methods.

An important alternative hypothesis is simply that the girls are really more socially desirable. Indeed this hypothesis receives considerable support from data on objective tests, in which females are more likely to be "honest," "accepting of social and ethical values," or culturally conforming (Cattell, 1957, p. 244).

Whereas the teacher-raters were common to both sexes, they were not common to all ages. There is the possibility that age variation in trait ratings might simply be due to different teacher biases at the different grade levels. It was noted, however, that variability in rating behavior among different raters was as great or greater within grades, than the variability of individual raters compared over different grades.

From Tables 3 and 4 it is apparent that there are significant changes from year to year on many factors, changes that occur within major periods of development and even within sub-periods. For example, in the early sub-period of middle-childhood, Factor C for boys goes from a value of 45.3 at age seven to a value of 52.4 at age eight.

Important as such results are from a substantive point of view, their methodological implications are perhaps more far-reaching. For the conclusion may be drawn that the concept of periods in development has had too great breadth. To quote a mean value for the whole five or six years of middle-childhood with respect to emotional maturity would clearly mask two very sharp cycles of development with low points at ages six, ten and thirteen. Indeed the present study seems to argue for concentration upon narrow time-units (such as years) in all phases of developmental research.

SUMMARY AND CONCLUSIONS

Year-by-year cross-sectional study of fifteen basic personality factors in 650 school-age children, as derived from teachers' trait-ratings, yielded significant age and sex differences. Trend-lines were computed over the years six through eighteen and were generally non-monotonic. Major inflections of the trend-line (or growth-curve) were found within the middle-childhood periods and within the adolescent period. Even within sub-periods such as the early part of middle-childhood, namely between the ages of six and nine, there were sharp inflections in the trend-lines of several factors. Discussion centered upon some problems of interpretation of data which confound teacher- or rater-differences with age-differences, and upon problems of disentangling teacher bias in favor of girls from true differences between boys and girls. The fact that sharp age differences were found even between adjacent years in several factors was judged to cast doubt upon the utility of the "period" concept in developmental research, and

it was suggested that concentration should be placed upon narrower time-units such as years.

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