

The Effect of Cardiovascular Disease
on Personality and Attitudinal Factors

S. B. Maitland, S. L. Willis & K. W. Schaie
Department of Human Development and Family Studies
The Pennsylvania State University
University Park, PA 16802

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Abstract

Using personality factors described in previous work (Maitland, Dutta, Schaie & Willis, 1992; Willis, Schaie & Maitland, 1992) this study examined a subsample of participants from the Seattle Longitudinal Study (SLS) to better understand the relationship of personality and attitudinal factors and cardiovascular disease (CVD). Previous work with the SLS population derived 13 personality and attitudinal factors using confirmatory factor analysis and demonstrated factorial invariance in these traits over time. The current sample consisted of 253 subjects (CVD=127, No-CVD=126) with a mean age of 70.6 years (range 43-92) who had complete data for the 1977, 1984 and 1991 data collection periods of the SLS.

This study examined the question of stability or change for these personality factors between 1977-1991, and tested for overall CVD, gender, cohort group and occasion differences. Significant differences in mean scores were found between the CVD and Non-CVD subjects for 5 of the 13 factors. CVD subjects scored higher on superego strength and honesty and lower on premsia, political concern and community involvement than Non-CVD subjects. Gender, cohort and occasion differences were present. A CVD by occasion interaction for honesty was also found, with CVD subjects considering themselves more honest in 1977 but declining in 1984 and leveling off through 1991, while Non-CVD subject's honesty rating increased between 1977 and 1984 and then declined sharply to its lowest level measured in 1991.

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In light of the long history of publications on cardiovascular disease, and the fact that CVD poses the primary health problem faced as we age, it should not be surprising that attempts to better understand this disease process continue. The focus has broadened from purely medical studies to include psychological and psychosocial determinants of chronic disease processes to build upon this knowledge. As discussed by Willis et. al. (1992), the association between psychological factors and health or disease should be studied over multiple occasions since this process is not static. The question of intraindividual change versus interindividual differences deserves attention not only because individuals continue to develop in adulthood, but also because this development and the disease process take place within a sociocultural context (Willis, et. al, 1992).

Based upon previous work conducted on the SLS population, the current study examines the issues of mean-level differences and stability and/or change of personality and attitudinal factors in a sample of subjects with CVD and controls. Earlier studies (Maitland, et. al., 1992) used confirmatory factor analytic techniques to derive a 13 personality and attitudinal factor model from the Test of Behavioral Rigidity Questionnaire (Schaie & Parham, 1975), a true/false personality and attitude measurement instrument derived from the California Psychological Inventory (CPI; Gough, 1955). This solution resulted from replication

studies of the original factor structure of the data suggested by Schaie and Parham (1976).

Previous work also utilized cross-sectional analyses to examine gender and cohort differences in independent samples for these personality and attitudinal factors measured in 1977 and 1984 (Maitland, et al., 1992). The current study includes a third wave of data collected in 1991 and re-examined the question of gender, cohort and cardiovascular disease differences, as well as employing a repeated measures design to look for longitudinal change in these 13 factors.

Subjects

The current sample consisted of 253 subjects ($M=114$; $F=139$) with a mean age of 70.6 ($SD=9.9$; range 43-92) from the SLS population. The SLS has been in progress over 35 years with the main objective of studying adult cognitive development and intellectual abilities. The SLS participants are recruited at random from a Health Maintenance Organization (HMO) in the Seattle metropolitan area. See Schaie (1983) for a detailed description of the history of the SLS.

Subjects for this study were selected based upon the presence of data for the 1977, 1984 and 1991 collection periods of the SLS (data were also collected in 1956, 1963, 1970). Full health history data was also a requirement for this study. Table 1 presents information about age and education by gender for the CVD and Non-CVD groups.

Table 1 here

Measures

A set of 13 personality and attitudinal factors was derived from the 75 item TBR Questionnaire. The 13-factor model was developed using a sample of pre-1977 subjects ($N=2515$) and tested for factorial invariance on subjects tested after 1977 ($N=2811$). The random-half validation was successful ($X^2 [df=2515]=6910$, $p < .0001$, $GFI = .945$, $RMSEA = .01$). The 13 personality and attitudinal factors are presented in Table 2 with an exemplar item from each factor. Items are true/false and subjects were asked whether or not the statement described them.

Table 2 here

Procedure

The TBR questionnaire accompanied a large battery of psychometric ability and demographic measures that were collected at each 7-year occasion of the SLS. Health history data were transcribed from the subject's medical records obtained from the HMO. The record consists of diagnoses using the International Classification of Disease (ICDA-8; USPHS, 1968) format, the time of

diagnosis, and number of incidents and episodes for each diagnosis between the years of 1956 and 1984. Using these resources, all subjects had personality and demographic data for 1977, 1984 and 1991. The method of coding CVD described by Hertzog, Schaie and Gribbin (1978) was used to eliminate cases of benign CVD that would not be expected to have an effect on personality and only cases of above average severity were included.

Due to sample size restrictions, cohort groups were obtained by collapsing the traditional 7-year birth cohorts used in the SLS. Three groups resulted with the following characteristics. The oldest-old group (N=72) had a mean age of 82.4 years (range 78-92). The young-old group (N=115) had a mean age of 71.3 years (range 64-77), and the middle-aged (N=65) had a mean of 57.6 years of age (range 43-63).

Table 3 here

Repeated measures analysis of covariance (RMANCOVA) was performed to examine mean level change and/or differences of the personality/attitudinal factors. A 2 CVD (presence/absence) x 2 gender x 3 cohort group x 3 occasion (1977, 1984, 1991) design was employed while covarying for education status. Trend analysis was also performed after applying orthogonal polynomial coefficients to transform the original personality variables.

Results

Significant main effects were found for CVD ($F=2.07$, $df=13.227$, $p < .02$), gender ($F=6.71$, $df=13.227$, $p < .001$), cohort group ($F=1.80$, $df=26.454$, $p < .01$) and occasion ($F=3.24$, $df=26.213$, $p < .001$). Results are reported for all personality and attitudinal factors that had these significant main effects. The only significant interaction was a gender by occasion effect for the honesty factor.

Main Effects for CVD

Significant factor results included superego strength ($F=4.00$, $p < .05$), premsia ($F=3.77$, $p < .05$), honesty ($F=5.23$, $p < .02$), political concern ($F=3.95$, $p < .05$), and community involvement ($F=4.04$, $p < .05$). Subjects with CVD scored higher on superego and honesty, and lower on premsia, political concern and community involvement than subjects without CVD. Therefore, subjects with CVD reported themselves as less concerned with public problems and global affairs, more tolerant of uncertainty, but more honest and conscientious or staid.

Table 4 here

Main Effects for Gender

The following factors showed significant gender differences: threectia ($F=35.00$, $p < .001$), untroubled adequacy ($F=5.40$, $p < .02$), group dependency ($F=20.11$, $p < .001$), and interest in science

(F=29.71, p < .001). Males scored higher on the traits of threctia and untroubled adequacy showing greater concern for law-abiding behavior and more tolerant of ambiguity than females, while females were higher for group dependency and interest in science.

Main Effects for Cohort Group

Significant results were found for premsia (F=3.47, p < .03), untroubled adequacy (F=6.23, p < .01), conservatism of temperament (F=10.90, p < .001), and honesty (F=6.29, p < .01). The oldest-old subjects scored significantly higher on premsia than the middle-age group but not higher than the young-old subjects. A similar result was found for untroubled adequacy, utilizing the HSD posthoc test for unequal sample size, with the oldest-old scoring significantly higher than the youngest group and only marginally different from the young-old group. Conservatism of temperament revealed the same pattern with the oldest-old scoring lower than both younger groups, and the younger groups not significantly different from each other. The only result to break from this pattern was the honesty factor which had both the oldest-old and young-old scoring significantly lower than the middle-aged subjects while the two older groups were not different from each other.

Table 5 here

Main Effect for Occasion

Personality and attitudinal factors which had a significant occasion effect included: threctia (F=14.83, p < .001), untroubled adequacy (F=7.75, p < .001), conservatism of temperament (F=9.06, p < .001), honesty (F=5.53, p < .01) and community involvement (F=6.13, p < .01). Post-hoc comparisons revealed declines for threctia, conservatism of temperament, honesty and community involvement that were significantly lower in 1991 than for earlier occasions. The only factor with the reverse trend was untroubled adequacy which had higher scores for 1991 than for earlier measurement points indicating less of an acceptance toward ambiguity in 1991.

CVD x Occasion Interaction for Honesty

A significant CVD x occasion interaction was found for the honesty factor. Previous analyses conducted on two time points of data (1977 & 1984) also revealed this trend (Willis, et al., 1992). CVD subjects reported themselves to have become less honest over the period of 1977-1984 and then leveled off through 1991, while those without CVD reported becoming more honest between 1977-1984. Interestingly, the Non-CVD subjects declined to a level that was lower in 1991 than the previous "low" level recorded in 1977. Examining cohort group differences we are reminded that the oldest-old and young-old scored themselves lower on honesty than the middle-aged group. It is interesting to note that subjects in both the CVD and Non-CVD groups decline over the entire fourteen year

study period (though they followed different patterns of decline in the interim).

Results from Trend Analysis

Trend analysis results provided further confirmation of the relationships described above and also revealed new information. A linear trend for threectia was found ($F=2.07$, $df=12,238$, $p < .02$). This reflects the gender differences noted in the previous analyses with females scoring lower than males. Group dependency was significant ($F=1.89$, $df=12,238$, $p < .04$), with a cohort by gender interaction ($F=3.58$, $p < .03$). Group dependency was lower in younger cohort groups and also lower in males than females. The only quadratic trend noted was for the honesty factor ($F=2.17$, $df=12,238$, $p < .01$). The main effect for CVD ($F=10.95$, $p < .001$) and cohort-group ($F=3.10$, $p < .05$) were significant. This trend has been described in the previous section. The new finding revealed through trend analysis was a linear trend for the flexibility factor ($F=2.23$, $df=12,238$, $p < .01$). This trend was found for the main effect of cohort-group ($F=5.11$, $p < .01$) with scores higher in younger groups.

Discussion

The goal of this paper was to examine the effects of cardiovascular disease on personality and attitudinal factors over a fourteen year period (three points of measurement). Previous work had defined the differences in these factors based upon gender, age, and CVD status in two earlier waves of the study.

Results for the CVD main effect indicate that subjects with CVD saw themselves as more conscientious, moralistic and honest and were more willing to accept uncertainty. Subjects with CVD were also less concerned with politically-related issues and community-involved or civic responsibilities.

Gender differences revealed that males were more self-assured or secure about themselves, more tolerant of ambiguity but also more law-abiding, and restrained. Females were less tolerant of ambiguity than males and higher on the trait of group dependency (indicating a "joiner" or adherence to groups). Females also expressed a higher interest in science.

Cohort group differences revealed the oldest-old were more tolerant of unpredictability than the middle-aged group but not different from the young-old. A similar finding existed with the untroubled adequacy factor: the oldest-old subjects were more willing to accept ambiguity while the middle-aged subjects were less tolerant. The two younger groups were scored as more conservative than the oldest-old, a finding which contradicts classic stereotypes! Finally, the oldest-old and young-old groups

were both significantly lower on honesty than the middle-aged subjects.

Decline over time was noted for a number of our factors. Subjects scored themselves as lower in such beliefs as concern for law-abiding behavior, conservatism of attitude, lower in honesty and less concern for community issues. The only factor with the reverse trend was untroubled adequacy revealing increased tolerance of ambiguity with age.

The present study expanded upon previous work by examining a fourteen-year (3 measurement) sequence of the SLS database for mean-level differences and/or change for 13 personality and attitudinal in subjects with CVD and controls without the disease. Future work will include examining these issues in the larger SLS database as well and examining the effect of other disease processes on personality and attitude measures.

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Table 1: Sample Description

Variable	CVD			No-CVD			Grand Total (N=253)
	M (N=57)	F (N=70)	Total (N=127)	M (N=57)	F (N=69)	Total (N=126)	
Age	74.60 (8.31)	74.31 (7.01)	74.44 (7.59)	66.86 (10.79)	67.91 (11.57)	67.45 (11.19)	70.94 (10.17)
Education (years)	15.02 (3.19)	14.00 (2.74)	14.46 (2.99)	15.12 (2.83)	14.00 (2.33)	14.51 (2.62)	14.48 (2.80)

Table 2: Personality Factors and Exemplar Items

Factor	Item
Affectothymia	There is no use doing things for people; you only find that you get it in the neck in the long run (negative)
Superego	I think that I am stricter about right and wrong than most people (positive)
Threctia	I have never been in trouble with the law (positive)
Premisia	I don't like things to be uncertain and unpredictable (negative)
Untroubled Adequacy	Our thinking would be a lot better off if we would just forget about words like "probably" "approximately", and "perhaps" (negative)
Conservatism of Temperament	I never make judgments about people until I am sure about the facts (positive)
Group Dependent	I was a slow learner at school (positive)
Low Self-Sentiment	I often start things I never finish (positive)
Honesty	If I get too much change in a store, I always give it back (positive)
Interest in Science	I like science (positive)
Flexibility	It bothers me when something unexpected interrupts my daily routine (positive)
Political Concern	We ought to worry about our own country and let the rest of the world take care of itself (negative)
Community Involvement	I would be ashamed not to use my privilege of voting (positive)

Table 3: Cohort Group Description

	<u>Birth Years</u>	<u>Mean Age 1991</u>	<u>Range</u>
Oldest-old (N=72)	1893 - 1913	82.36	78-92
Young-old (N=115)	1914 - 1927	71.34	64-77
Middle-aged (N=65)	1928 - 1948	57.58	43-63

Table 4: T-Score Means for CVD Status and Gender

Variable	CVD Status		Gender	
	Yes	No	M	F
Affectothymia	48.40	50.37	50.00	48.78
Superego	51.51	49.17*	49.68	51.00
Threectia	49.29	49.63	52.90	46.02***
Premsia	48.39	50.74*	49.23	49.89
Untroubled Adequacy	48.79	50.56	50.68	48.67*
Conservatism of Temperament	50.59	50.26	50.31	50.54
Group Dependency	48.63	50.39	47.19	51.84***
Low Self- Sentiment	49.13	50.13	48.90	50.35
Honesty	51.15	48.82*	50.70	49.27
Interest in Science	49.70	49.96	46.59	53.08***
Flexibility	50.89	49.98	49.70	51.17
Political Concern	48.01	50.07*	48.26	49.82
Community Involvement	48.41	50.81*	49.27	49.95

*p < .05, **p < .01, ***p < .001

Table 5: T-Score Means for Cohort-Group and Occasion

Variable	Cohort-Group			Occasion		
	O-O	Y-O	M-A	1977	1984	1991
Affectothymia	49.91	48.99	49.25	50.04	49.17	48.94
Superego	49.10	50.26	51.66	50.51	50.42	50.10
Threctia	49.24	49.16	49.98	50.58	50.45	47.35***
Premisia	51.57	49.79	47.32*	49.29	48.87	50.53
Untroubled Adequacy	52.09	49.20	47.75**	49.20	48.64	51.19***
Conservatism of Temperament	47.72	52.39	51.16***	51.21	51.13	48.93***
Group Dependency	50.14	49.28	49.12	49.28	50.20	49.06
Low Self Sentiment	50.87	49.45	48.56	49.29	49.47	50.11
Honesty	48.56	48.53	52.87**	50.61	50.82	48.52**
Interest in Science	50.38	49.53	49.59	49.71	49.47	50.32
Flexibility	48.83	50.59	51.89	50.39	50.63	50.29
Political Concern	49.33	48.87	48.92	48.97	49.18	48.97
Community Involvement	48.67	50.05	50.11	50.53	50.18	48.13**

*p < .05, **p < .01, ***p < .001