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Status after early retirement the effects of social network and activity level on body age and health

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STATUS AFTER EARLY RETIREMENT:

THE EFFECTS OF

SOCIAL NETWORK AND ACTIVITY LEVEL

ON BODY AGE AND HEALTH

by

Tom Malcomson

A THESIS

submitted to the Department of Psychology
in partial fulfillment of the
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ABSTRACT

The present study explored the relationship of general health and body age (measured by the Adult Growth Examination, Morgan , 1981) with leisure activity, social network and life events, for 38 noncommissioned officers; retiring in 1981 or 1976. Retirees from 1981 were expected to have experienced more change in health, leisure activity, and social network, life events and to have poorer health and body age scores. Importance and satisfaction of relationships, few life changes, high frequency and enjoyment of leisure activity were expected to be related to perceived good health and low body ages. Perceived good health and low body ages were expected to have fewer changes in leisure activity and social network and fewer life events than high body ages and poor health. Those in good health were expected to have fewer contacts with social service and health providers than those in poor health. The 1981 group experienced significantly more change in social network and activity level than the 1976 group. Body age was found to be unrelated to all other variables for the present sample. General health was related to life events, activity frequency and enjoyment, and social network. However, the

relationship between general health and importance and satisfaction of relationships was more complex than predicted, and requires further study. The possible impact of self-selecting characteristics of the participants was discussed. The present study failed to find a group of people with significantly older body ages which may account for the failure of body age to be related to the other variables. Methodological problems were noted and future research suggested.

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Foner and Schwab (1981) and Kleiler (1978) reported that the incidence of early retirement is on the increase. This is particularly true among civil servants, the police and firefighters, as retirement becomes possible at a younger age, based on the number of years employed. The current study will attempt to examine the relationship between the physical health of retired military personnel (age 38 to 55 years) and their social network and leisure activity involvement. Although retirement for the military personnel occurs at the natural end of their career it takes place early in life relative to that of the general population. The review of relevant literature will be organized as follows: Retirement and Health; Retirement and Social

Network; Retirement and Activity; leading to The Present Study and Predictions. Each section will contain a review of the research pertaining to retirement at age 65 and military retirement.

Retirement and Health

Review of the literature exploring the effect of retirement on health, at age 65, reveals contradictory findings (Friedmann and Orbach, 1974; MacBride, 1976; Rowland, 1977; McKenzie, 1980; and Foner and Schwab, 1981). McKenzie (1980) stated that no direct relationship has been established between continued working and longevity, or between retirement and increased occurrence of early mortality. Friedmann and Orbach (1974), in a review of the retirement literature, asserted that research indicated that retirement benefited health. Both McKenzie (1980) and Friedmann and Orbach (1974) suggested poor health prior to retirement accounts for the occurrence of poor health or increased mortality after retirement.

Crawford (1972) found a minority of subjects "changed the description of their health" (p.378) between pre and post retirement interviews. Changes that did occur were equally balanced between increases and decreases in health problems. Perhaps most importantly, Crawford (1972) reported it did not appear that any stress experienced

through retirement was expressed in psychosomatic terms. Crawford (1972) stated that people in poor health prior to retirement either die shortly after retirement, or remain in poor health. Those in good health before retirement remain in good health, unaffected by the event of retirement.

Kimmel, Price and Walker (1978), while examining voluntary and nonvoluntary retirement and retirement satisfaction, noted that health of voluntary retirees was superior to nonvoluntary retirees. However, a close scrutiny of their data revealed that the five years between the original retirement survey answers and their 1978 survey had yielded a slight decline in the health of those in good health prior to retirement. Similarily, those in poor health in the pre-retirement study showed a small benefit in their health after retirement. Nonvoluntary retirees were also less likely to work after retirement due to poor health or inability to find a job than voluntary retirees. They also found that those in good health retired later and were more satisfied with retirement than those in poor health.

Haynes et al. (1977) examined the mortality rates among retired industrial workers six years after retirement. They found low status employees had a higher mortality rate within the first three years of retirement than higher status workers. The higher status employees had a higher mortality rate in years four and five after retirement. Their findings are in accord with those of Martin and Doran

(1966) who found an increase in poor health four to six years after retirement. Haynes et al. (1977) stated, in opposition to Crawford (1972), that retirement is a very stressful event as a result of the loss of socially meaningful roles, and a decrease in activity. They conclude that role loss, declined activity, attitudes towards work, income and medical condition prior to retirement influence "the early death of some workers after retirement" (p. 112).

Haynes et al. (1978), studying mortality among early (62 to 64 years of age) and normal (age 65) retirees, attributed mortality in early retirees to pre-retirement health status. They also found normal retirement not to be "obviously detrimental to survival" (p. 276). Haynes et al. (1978) found lower status employees to show an increase in mortality rate three years after normal retirement. The high status employees showed an increase in mortality rate five years after retirement, which supported their earlier findings.

Although unrelated directly to retirement, Kasl and Cobb (1970) examined the blood pressure changes of 150 men experiencing job loss over a period of two years. They found the blood pressure of men who lost their job significantly increased during the period of unemployment and subsequent adjustment to reemployment, compared to an employed control group. Those men whose blood pressure remained high the longest "had a more severe unemployment

experience" (p. 36) and indicated more subjective stress. Changes in diastolic blood pressure were more closely associated with these findings than changes in systolic blood pressure. However, Kasl and Cobb (1970) noted that changes in diastolic and systolic blood pressure were positively correlated, but systolic blood pressure did not show the same degree of change as diastolic blood pressure.

McMahan and Ford (1955) studied mortality rates of Air Force officers who were retired for five years. They found the mortality rate within this time frame was higher for officers retired between the ages of 50 and 59, compared to the average for white American males. However, officers between 60 and 69 years of age had a mortality rate less than that of the average white American male of similar age. These findings were considered by the authors to be confounded by the health of the subjects prior to retirement. They suggested that officers retiring between 50 and 59 years of age may have done so as a result of health disabilities which may in turn have resulted in their above average mortality rate. Similarily, the older group may have a lower mortality rate due to a superior condition of health at the time of retirement. They further observed that no conclusion could be drawn regarding health and retirement based on their sample. Therefore future research should differentiate health related from nonhealth related retirements.

McNeil and Giffen (1965 and 1967) viewed retirement from the military as potentially creating a great deal of stress for the retiree. Unlike its civilian counterpart, military retirement is based on a restricted number of years of service and not chronological age. As a result military retirees, at time of retirement, are middle aged and do not usually retire to leisure activity, but seek a second career. The authors noted the unique nature of the social system within the military which is removed from the nonmilitary civilian society. They posited that military life has very well defined roles and status positions, removal from which will result in stress. Further, they suggested the stress of adjusting to civilian life may result in the need for medical intervention.

McNeil and Giffen (1965 and 1967) proposed a retirement syndrome for military personnel involving psychological and psychosomatic symptoms. The psychological complaints include anxiety, irritability, apprehension, job ineffectiveness, apathy, alcohol abuse, and depression. The psychosomatic complaints are usually centered on gastrointestinal tract or cardiovascular problems. Onset of the symptoms occurs in the two or three years prior to retirement and without intervention continue into retirement. Without resolution of these problems individuals' adjustment to retirement can be potentially marred by psychological and physical health problems.

MacBride (1976) stated that past research has dwelled on single aspects of the effects retirement has on the individual and have failed to account for other variables. In agreement with McKenzie (1980) and Friedmann and Orbach (1974) she suggested that factors such as subjects' health, income and socioeconomic status combine to influence adjustment to retirement. Further, the occurrence of life events at the time of and during retirement will effect the subjects' physical reaction to retirement.

MacBride (1976) criticized past research, with both civilian and military samples, which found a negative effect of retirement, as being based on theoretical postulation and limited case histories. She suggested that research employing proper experimental methodology has tended to show a positive effect on the individual as a result of retirement. She notes that research concerning the effect of retirement on health has been the area of most interest and contradictory results.

Friedmann and Orbach (1974) warned against the eager acceptance of the present belief that retirement in good health does not potentially lead to a decline in health. They contend that where past researchers' "superstitous belief" (p. 367) was that retirement led to poor health and increased mortality, the present disbelief of a harmful effect may be "based on inconclusive research" (p. 367).

Perhaps the major problem in this area, one that MacBride (1976) and Friedmann and Orbach (1974) failed to mention, is the method of measuring indices of health change. Haynes et al. (1977) noted that self reported health status in research yields data of a questionnable nature. They report that overestimation of good health by subjects occurs twice as often as underestimation. Thus research such as that of Crawford (1972) and Kimmel et al. (1978) are suspect of showing an artificially inflated positive impact of retirement.

Haynes et al. (1977) further suggested that studies of health are speculative until an "actual physiological measure" (p. 113) of an individual's reaction to retirement is found. A potentially sensitive measurement of the body's physical reaction to life events such as retirement may be the Adult Growth Examination (AGE) (Morgan, 1981). Morgan (1981) created AGE to establish the body age, or physiological age, of an individual. The body age may be different from the chronological age. The test consists of measuring systolic blood pressure, near point vision, and high frequency hearing. Morgan (1981) reported that past research has found these three measures to "correlate significantly with calendar age and may be used to predict aging for specific populations by specific formulae" (p. 63). However, to date, the AGE has not been employed in a study of the adaptation to retirement.

Retirement and Social Network

Wan and Weissert (1981) and Winnubst, Marcelissen and Kleber (1982) noted the role social network systems provide in reducing the physical harm resulting from stressful situations. Wan and Weissert (1981) found accessibility of family and friends to be related with "high levels of physical and mental functioning" (p. 253) in a sample of senior citizens. Those living without access to social support systems were hospitalized more frequently and for longer periods of time than those with a social support system. Winnubst et al. (1982) found social support from supervisors and fellow workers acted as a buffer to the effects of stress on employees' health. They further noted that various sources and forms of social support differentially affected stress reactions (i.e. supervisors are the main source of support when job role confusion and job future are of concern).

Friedmann and Orbach (1974) stated that retirement has been viewed as a time of social upheaval in the retiree's life. They asserted the prevalent view is that loss of work is "totally disruptive of family life and relationships" (p. 626) with loss of respect, authority, meaning and function for the retiree. However, they criticized this orientation for placing family life under the domination of the work role. Friedmann and Orbach (1974) suggested that family

relationships can act as a cushion to the problems of retirement. They contend that research has ignored the role of increased family contact as a replacement for lost activity of and involvement in work.

Dohrenwend and Dohrenwend (1978) stated the extent of emotional support offered by the social network to an individual experiencing a life change influences the reaction to the change. The more supportive the social network the healthier the person's adjustment to the change in their life situation. Streib (1965) supports this view of the importance of family relationships after retirement. Streib's (1965) research noted retirees had perceived an increased closeness to their family. Friedmann and Orbach (1974) noted that contact between family members is "the consequence of situational conditions such as residential proximity, health and economic situation" (p. 627).

In a similar manner, Friedmann and Orbach (1974) note that past research has predicted a decrease in social interaction with the nonfamily members of the retirees social network. However, they observed that past research has failed to account for potential differences in subjects' past history of social interaction and their current involvement which may be due to social or situational factors. Friedmann and Orbach (1974) stated research provides no reason to believe that retirement leads to a decrease in social networks and activity if health,

socioeconomic status, situational factors and past history of contact are controlled.

Rowland (1977) suggested that as retirement becomes a commonplace occurrence the loss of status or sense of social role will become less stressful to the individual. He noted the increase in access to organizations for older people as sources of activity and social involvement. Therefore social network loss at retirement is replaced by entry into new activities. Rowland (1977) posited that the extended social network softens the stressfulness of retirement and may be partially responsible for low relationships between retirement and mortality.

Past research has also concentrated on quantitative aspects of social interaction and has ignored the qualitative nature of the interactions as viewed by the retiree. Haynes et al. (1978) reported that marital status, club membership and number of dependents at time of retirement did not predict subsequent survival. The mere fact of being married, with a family and involvement in activities "were not protective against mortality" (p. 277). They suggested that qualitative measures such as "actual love and support from spouse" (p. 277), be used instead of simply counting the presence of a spouse and number of relatives and friends in the individual's social network. Dyson (1980) criticized past retirement research for failing to assess the individual's personal orientation toward the

members of their social network. She suggested that apart from the number of social contacts researchers need to establish the importance of and satisfaction gained from the relationships.

McNeil and Giffen (1965 and 1967) noted that, for military personnel, retirement to civilian life often results in drastic changes in the type of interpersonal relationships in which they are involved. This is due to the loss of culturally ascribed military rules of interpersonal behavior, some of which are based on their former rank. Giffen and McNeil (1965 and 1967) noted that second careers are usually necessary to meet their family responsibilities. Often the second career is not as rewarding in income and/or status as the military career. This potentially results in stress within the family with tension between the retiree and their family members. However, they deal with only psychological problems caused by the upheaval of retirement. To date, there are no studies which specifically examine the relationship between social network after retirement and health.

Methodologically, Wan and Weissert (1981) noted that measures of social support in the past have ranged from type of aid provided to the presence of a marital relationship. Carveth and Gottlieb (1979) expressed the need to measure multiple sources of social support (i.e. specific family members, friends and health providers). Further, Wan and

Weissert (1981), and Carveth and Gottlieb (1979) stated that definitions of social network focus on different aspects of the social contacts, from receiving information indicative of being loved, to simply the presence of others and informative feedback concerning "behavior and its consequences" (p. 180). Lin, Simeone, Ensel, and Kuo (1979) defined social network as "support accessible to an individual through social ties to other individuals, groups and the larger community" (p. 109).

Retirement and Activity

Increase in the amount of leisure time after retirement has received a great deal of attention by researchers (Roner and Schwab, 1981). There is the concern that extra time after retirement will not be used in a constructive fashion, resulting in the retiree deteriorating in both psychological and physical health. Cummings and Henry (1961) found their older subjects to be involved in fewer activities than the younger subjects. They proposed that this is a natural and positive outcome of the aging process, to become less involved as one grows older. Contrary to this position is the notion that continued involvement in activities leads to healthy adjustment to the aging process (Knapp, 1977; and Lemon, Bengtson and Peterson, 1972).

Mutran and Reitzer (1981) reported that retirement may inhibit participation in leisure activity as a result of the identity crisis involved in leaving the work force. As a result of surrendering the central role of provider the person experiences a drop in self-esteem and self-respect which threatens the individual's confidence in performing other roles, especially participation in social and leisure activity. They found that maintenance of a high level of social and leisure participation aided in yielding a 'young' identity in both a group of working men and a group of retired men.

Foner and Schwab (1981), citing the findings of the unpublished 1975 Retirement History Study, stated that retirees (age 64 to 69) on the whole did not change their activity levels after retirement. However, nearly half the respondents reported increased contact with family and friends, while one third reported a decrease in such contact. Involvement in hobbies increased for one quarter of the sample while an increase in household chores was reported by one fifth of the sample. Comparison with an employed sample of a similar age indicate that overall, retirees do not differ from employed subjects with regards to their activity involvement.

Ingraham (1974), studying retired teachers (age 60 to 99), reported nearly half of the respondents worked fulltime after retirement. The jobs they held were similar to the

ones they had retired from. Money was the reason given by 29 percent of respondents for returning to work. A desire to work again, missing their former jobs, and "an offer too attractive to refuse" (p. 83), were the other main reasons for reemployment. Ingraham (1974) found half the respondents had engaged in some form of voluntary service after retirement. He noted that 28 percent of the respondents neither worked nor engaged in voluntary service after retirement.

Simpson, Back and McKinney (1966) examined the differences between different levels of occupational status and prior history of job orderliness and activity involvement after retirement. They found that upper-white-collar workers were involved in more activities after retirement than semi skilled or middle-status retirees. The orderliness of the individuals' employment experience also was related to high involvement after retirement. That is, those who were employed by the fewest organizations had more involvement after retirement than those who were employed by many companies.

They stated that "many patterns of social involvement supported by work persist" (p. 73) into retirement. However, upper-white-collar retirees were found to lose more pre-retirement involvements than other status levels because these activities were too closely associated with work. Simpson et al. (1966) noted that if people had not engaged

in leisure activities , or social interaction prior to retirement it appeared that they did not after.

The research findings reported by Foner and Schwab (1981) and Ingraham (1974) suggested that retirement is a time of continued and even increased activity involvement countering Cumming and Henry's (1961) view of disengagement. However, Puner (1977) asserted that retirement leaves a void in the retiree's life as the work role is surrendered. He proposed that the initial period of retirement is dominated by a lack of involvement and a sense of uselessness. Puner (1977) viewed retirement as indicating the beginning of the final phase of the retiree's life. Unfortunately Puner did not offer data to support his premise, only referring to the numerous support agencies for retirees and a statement from a conference on gerontology declaring older people spend many hours each day "doing absolutely nothing" (p. 136). He contended that lack of activity and the severe reaction to the loss of the work role leads to the increased mortality rate within the first year of retirement. However, as noted above, the relationship between retirement and increased mortality lacks the support of current data.

O'Brien (1981) noted that no research has been conducted on the relationship between leisure activity and retirement satisfaction. He observed that research involving assessment of leisure activity has failed in the past to assess the qualitative nature of the activities. O'Brien

(1981) predicted that skill utilization for pre-retirement employment would be important in post-retirement activity and life satisfaction. Although skill utilization was not found to be important, social interaction and the number of activities were related to life satisfaction. He proposed that retirement may lead to isolation and therefore any activity promoting social interaction may be highly valued. O'Brien (1981) recommended that future research should pursue the social interaction nature of activities with the addition of measuring the frequency of the activities. O'Brien (1981) also noted that activity level was related to satisfaction with health and income level. However, he failed to collect enough health data to adequately describe the extent of the relationship.

The research reviewed so far has studied retirement at age 65. Early retirement and activity level does not appear to have received any attention. McNeil and Giffen (1967) and Giffen and McNeil (1967) did not deal with the leisure activities which retired military personnel become involved in and how they relate to retirement adjustment. However, McNeil and Giffen (1965) stated that military retirees usually have familial responsibilities requiring them to seek employment negating the use of leisure activities to the same extent as for retirees at the age of 65. However, if the time between military retirement and beginning of a new career is a time of crisis then leisure activity may be

of extreme importance. Leisure activity may allow the military retiree to fill the gap left by leaving the military establishment. Involvement in civilian activities may help to bridge the distance between military and civilian life styles. Thus individuals who are adapting successfully to military retirement may be engaged in more activities resulting in more social interaction than retirees who are not successfully adapting to retirement.

The relationship between leisure activity involvement and health has not been explored in either normal or early retirement. O'Brien (1981) noted a link between health and activity but as mentioned above did not detail the nature of the relationship. Poor health prior to retirement may impede involvement after retirement. Increased involvement after retirement may serve to counter the possible decline in health due to the stress of retirement. This last possibility is supported by Friedmann and Orbach (1974) who suggested that post-retirement clubs and emphasis on activity may offset some of the earlier findings of a decline in health after retirement.

The present study and hypotheses

The present study will examine the relationship between the health and social network and leisure activity level of two groups of retired military personnel. Research reported

by Haynes et al. (1977, 1978), Giffen and McNeil (1967) and Friedmann and Orbach (1974) suggested that the effect of retirement on the individual was mediated by the amount of time since retirement. Haynes et al. (1977, 1978) reported an increase in mortality rates three to five years after retirement. Giffen and McNeil (1967) discussed an unspecified period of adjustment beginning prior to retirement and lasting into post-retirement reemployment. Contrary to these last two findings, Friedmann and Orbach (1974) indicated that health improved after retirement. Therefore, one group in the present study will have retired in 1981 while the second group will have been retired since 1976.

It was noted earlier that past research regarding effects on health of retirement has primarily used self ratings of health and that this approach may lead to data of a questionable nature (Haynes et al., 1977). The present study will employ two measures of health: one will consist of self ratings by the subject, but the second will involve the AGE test. Self report ratings will allow comparison between the present research and past research. The AGE test will yield a physiological indication of the individual's reaction to retirement. Friedmann and Orbach (1974) and MacBride (1980) criticized earlier research for not accounting for the possible impact of other life events on the health of retirees. Thus the present study will also employ a measure of life change.

Finally, Haynes et al. (1978), Streib (1965), Dyson (1980) and Carveth and Gottlieb (1979) noted a need to examine the subjects' view of the importance and satisfaction with the relationships in their social network. This suggestion could also be extended to research on leisure activity with acquiring the level of enjoyment the individual has for the activity in which they are engaged. Therefore, the present study will include ratings of satisfaction and importance for each relationship in the subjects' social network, as well as the number and type of regular contact. The present investigation will also rate the enjoyment and frequency of the subjects' leisure activities.

Based on the review of the literature the following predictions are made for the relationship between general health self ratings, social network, and leisure activity. A negative correlation is predicted between scores on the self rated health questionnaire and ratings of importance and satisfaction of the relationships within the individual's social network. That is, those in good health (low scores on the self rating questionnaire) will have high scores on the ratings for importance and satisfaction of their relationships. These individuals will also report fewer contacts with social and health service providers than those in poor health. The military retirees in good health should also have experienced less change in their social network in the past year.

With regards to leisure activity, a negative correlation is predicted between scores on the self rated health questionnaire and rating of frequency and enjoyment of leisure activities. As with social network, those in good health will have high scores on ratings of frequency of involvement in activities and enjoyment of those activities. Those in good health will have experienced less change in their leisure activities over the past year compared to those in poor health.

Self rated health scores should also be negatively correlated to the occurrence of life events in the past year. Those in good health should report fewer life events within the past year than those in poor health.

Predictions concerning the relationship between body age scores on the AGE test and social network and leisure activity are similar to those outlined above. Body age scores will be negatively correlated with importance and satisfaction with relationships in the social network. Subjects with lower body ages than their chronological age will have higher scores on the ratings of importance and satisfaction of the relationships in the social network than those with body age scores higher than their chronological age. Subjects with low body age scores will also report less change in their social network than those with high body age scores.

A negative correlation is predicted between body age scores and leisure activity frequency and enjoyment ratings. Subjects with low body age scores should show a high frequency of involvement in the leisure activities accompanied by a high rate of enjoyment. Those with low body age scores should indicate less change in their activity level over the past year than those with a high body age score. Low body age scores will also be associated with low scores on the life event scale.

As for differences between the two groups of military retirees the following predictions are made based on the studies of Haynes et al. (1977, 1978), Giffen and McNeil (1967) and McNeil and Giffen (1967). It is predicted that the group of retirees from 1981 will have poorer general health ratings and higher body age scores than those who retired in 1976, as result of the stress from their recent retirement. The 1967 group is also expected to have fewer changes in their health, social network, leisure activity and lower life event scores than the men retiring in 1981.

In summary the present study examined the following nine hypotheses:

1. General health ratings will be negatively correlated with ratings of importance and satisfaction of the relationships within the individuals' social network.

2. General health ratings will be negatively correlated with ratings of frequency and enjoyment of leisure activities.

3. General health ratings will be positively correlated with scores on the life events scale.

4. Participants with low scores on the general health scale are predicted to have had fewer contacts with social service and health providers, less change in their social network and leisure activity and fewer life events than those with high scores on the general health scale.

5. AGE test scores will be negatively correlated with importance and satisfaction with relationships within the participants' social network.

6. AGE test scores will be negatively correlated with ratings of frequency and enjoyment of leisure activities.

7. AGE test scores will be positively correlated with scores on the life events scale.

8. Participants with low AGE test scores are predicted to have had less change in their social network and leisure activity and lower scores on the life events scale than those with high AGE test scores.

9. Participants retiring in 1981 will have higher body age and general health scores, more change in their health, social network, and leisure activity, and higher scores on the life events scale than those who retired in 1976.

Method

Subjects Thirty eight male noncommissioned officers retired from the Canadian military participated in the present study. Their mean length of service was 28.77 years (standard deviation SD = 12.65). The mean age of the eight participants who retired in 1976 was 49.63 (SD= 5.32), while the mean age of the 30 men retiring in 1981 was 46.93 (SD= 4.58). Participants retired after a minimum of 20 years military service and therefore receive a military pension. There are 147 retired noncommissioned officers presently living in one of the following urban areas: Toronto, Hamilton, St. Catharines, Brantford, Guelph, Kitchener, Waterloo. Selection of only Noncommissioned Officers living in urban areas controled for the differences between various levels of rank and urban versus rural experiences, respectively.

In order to obtain the 38 participants, 147 unaddressed packages were sent to the National Defense Headquarters in Ottawa. For the protection of the participants' confidentiality, address labels were placed on the 147

envelopes by military personnel at the National Defense Headquarters in Ottawa. Address labels were randomly placed on the two sizes of envelopes (see explaination below) within each retirement year and then placed in the mail. Fifty eight of these packages were to be sent to 1976 retirees, while 89 packages were to be sent to the 1981 retirees. Half of each group of potential participants received a 26.67 cm x 19.05 cm envelope containing a letter explaining the research and asking for their cooperation, plus a stamped, addressed envelope and two consent forms (one of which the participant was to retain) (See Appendix A for a copy of the consent form). The letter informed the participant that if they choose to participate a Body Age test would be conducted first followed by completion of a questionnaire (See Appendix B for a copy of the letter type I sent to potential participants). The remaining retired personnel received a 36.83 cm x 29.21 cm envelope containing a letter differing from the other letter only in specifying the order of testing. That is, this group of potential participants completed the questionnaire first and then a Body Age test appointment was arranged (See Appendix C for a copy of letter type II sent to potential participants). Six weeks after the initial packages were sent out a reminder letter was mailed, via the National Defense Headquarters, to those who had not replied (See Appendix D for a copy of the reminder letter).

Apart from the 38 actual participants 13 packages were returned because of a change in address for the 58 sent to 1976 retirees, while only two envelopes were returned as a result of a change in address for the 1981 group. One participant retiring in 1976 completed the Body Age test but failed to return a questionnaire. After repeated unsuccessful attempts to contact this person his Body Age data was withdrawn from the sample. Another potential participant, retiring in 1981, expressed an interest in the study but moved before arrangements for a Body Age test and questionnaire completion could be made. Data was not collected on another potential participant expressing an interest in the study due to the fact he lived in Indonesia. Finally, one individual returned his consent form unsigned, with the following message, "I do not wish to participate. Therefore, from the 147 potential participants 57 individuals were accounted for.

Apparatus In order to test body age the Adult Growth Examination (AGE) (Morgan, 1981) was employed. The AGE test includes a portable blood pressure unit, portable audiometric monitor and portable visual near point indicator, with vision cards. A portable Beltone Audiometer (Model 10D) was used in administering the hearing test to subjects. Systolic blood pressure was measured by a battery operated Digital Sphygmomanometer (Astropulse, 99). Near

point vision is measured using a 64 inch metal ruler and a visual target card (7.62 cm x 12.70 cm) on which a sentence is placed in pica type. The ruler is mounted on two pedestals. The pedestal at the furthest end of the ruler from the subject is 35.56 cm in height. The participant placed their chin on a 25.40 cm high pedestal and held the end of the ruler to the bridge of their nose. A vision card was moved toward the participant from the far end until they could see the sentence clearly. The vision card was then moved closer, until the sentence began to blurr. At this point the remaining distance to the participants nose was noted on the ruler and recorded on the AGE test score sheet. (See Appendix E for a copy of the AGE test manual.)

General health was measured using 11 questions dealing with health from the Social Change in Canada: Trends in Attitudes, Values and Perceptions questionnaire (1977). The 11 questions assess the subjects' opinion of their physical health over the preceding six months. All questions are forced choice allowing, however, the participants to specify the occurrence of any long standing health problem other than the five mentioned in the questionnaire. Participants were asked to indicate the number of times they have visited their doctor, been hospitalized (with and without surgery) in the past 12 months, and whether they were taking any prescribed medication. One question was added to ask the subject to

indicate whether there had been any change in his health over the past year, and if so to briefly describe the change(s). (See Appendix F for a copy of the general health scale.)

Leisure activity frequency of involvement and enjoyment level was measured using the scale created by Pace (1941). The scale contains 47 activities in which an adult may be involved. Each of the 47 items is rated by the subject for frequency of involvement in the activity (1. Never, 2.Rarely, 3. Occasionally, 4. Fairly Often, 5. Frequently) and then rated again for their enjoyment of the activities they are engaged in (1. Dislike Very Much, 2. Dislike, 3. Indifferent, 4. Like, 5. Like Very Much). One question was added to ask the participant if there had been a change in his activity level over the past year, and if so to briefly describe the change(s). (See Appendix G for a copy of the Leisure Activity scale.)

Social network data was collected using a scale specifically created for this study. Participants were told to write down the first names of individuals with whom they have regular contact, either in person, by telephone, or by mail. Subjects then rated each relationship for type of relationship (1. Family Member, 2. Nonfamily Relative, 3. Friend, 4. Social and Health Service Provider), frequency of contact in the past year (1. Once a year, 2. Three times a year or twice a year, 3. Every two months or four times a

year, 4. Every two weeks or once a month, 5. Daily or weekly), the importance of the relationship to them (1. Very Unimportant, 2. Unimportant, 3. Neutral, 4. Important, 5. Very Important), and their satisfaction with the relationship (1. Very Unsatisfied, 2. Unsatisfied, 3. Neutral, 4. Satisfied, 5. Very Satisfied). Subjects were also asked if there had been any change in his social network over the past year, and if so to briefly describe the change(s). (See Appendix H for a copy of the social network scale.)

The amount of life event change was measured by the Paykel, Prusoff and Uhlenhuth (1971) adapted version of the Holmes and Rahe (1967) scale of life events. The scale consists of 61 events that an adult may experience. Participants proceeded through the 61 events and indicate the number of times the events had occurred in their life within the past 12 months. (See Appendix I for a copy of the life event scale.)

Another form was completed by the subjects on which demographic information pertaining to age, marital status, current occupation, present income level, last rank and duty held before retiring from the military, military income, present residence, length of time since retirement, time in the military, number of postings outside of Canada while in the military, religion, education level, were all asked. (See Appendix J for a copy of the demographic information form.)

Procedure

Pretest The social network, leisure activity, general health and life event scales were tested for test-retest reliability in a pilot study. The pilot study involved 15 university students completing the specified scales on two occasions separated by a period of one week. Pilot study subjects were not informed on the first session that the second would involve the completion of the same scales.

Main Study As mentioned above two types of packages were mailed to the participants, one containing a questionnaire, the other asking for an AGE test appointment to be made prior to completion of the questionnaire. This procedure was conducted in an attempt to balance the order of the two tests. Twenty of the participants received the AGE test first, followed by the questionnaire. The remaining 18 participants experienced the AGE test and questionnaire in the reverse order. Figure 1 depicts the design of the main study.

Subjects were contacted by telephone and arrangements were made for completing the questionnaire and administration of the AGE test. Participants living in Kitchener, Waterloo and Guelph had their AGE test administered in the Aging Lab at Wilfrid Laurier University. Retirees living in London and St. Catharines were given the

Figure 1

Design of the Study

Year of Retirement	Subdivision of group by order of test	Order of Tests	
1981	n= 16	Questionnaire	Adult Growth Examination
n= 30	n= 14	Adult Growth Examination	Questionnaire
1976	n= 4	Questionnaire	Adult Growth Examination
n= 8	n= 4	Adult Growth Examination	Questionnaire

AGE test in a convenient academic institution or in their own home. Retirees living in Toronto were tested at the Clarke Institute, in Toronto, or in the privacy of their own home. All other subjects were tested in the privacy of their own home with the exception of two men, one who was tested in a laboratory where he worked and the other who was tested in an empty Officers lounge in an Armoury. Although room size varied among the settings, all rooms were brightly lit and as free from outside noise as possible (i.e. appliances were turned off, other people were sent to another room in the dwelling).

Participants receiving the paper and pencil tests first were mailed the appropriate materials. They were asked to bring the completed scales with them to the AGE testing session. The other subjects were given the package of questionnaires at the end of their AGE testing session. They were asked to complete the forms at home and mail in the scales using the enclosed stamped envelope. Apart from these differences both groups received identical forms and instructions. The questionnaire package were arranged in the following manner: (a) the demographic information form, (b), the leisure activity scale, (c), the general health questionnaire, (d), the social network information, and (e), the life events scale.

The AGE test began with the taking of the first of three systolic blood pressure readings. Subjects are then given a

hearing test at 1000 Hz and again at 6000 Hz. The hearing test involves the establishment of the auditory threshold by decreasing the decible output until the subject indicates hearing the signaled tone only half the time that the experimenter is sending it to them. The second of three systolic blood pressure readings is taken at the conclusion of the hearing test, followed by the near vision test. Finally the third systolic blood pressure reading is taken. The experimenter then converts the raw scores into three body age scores by consulting the norms in Morgan (1981). From these three scores the median score is used to indicate the overall body age of the subject. Twenty-four of the AGE tests were administered by three trained Lab Assistants who remained naive to the predictions of the current study. Due to a problem in scheduling AGE tests and assistants the experimenter administered 14 AGE tests personally. At the outset of the AGE testing session participants signed a consent form granting the experimenter permission to send the test results to their physican if the systolic blood pressure indicated the possibility of hypertension. (See Appendix K for a copy of the medical release form.)

The demographic data was scored by assigning numerical values to the answers. However, income levels were treated as raw data and not otherwise coded. The leisure activity scale yielded two scores: one for frequency of activity and one for enjoyment level. Separate total frequency of

activity and enjoyment of activity scores were obtained for each subject for analysis.

The general health scale yielded an overall score of general health by adding the responses to items 1,2,4, and 6 through 11. Answers were scored in a manner to produce a high score indicating illness, or a low score indicating health. Answers to questions concerning visits to a doctor, number of days ill, and number of days hospitalized (with or without surgery) were treated as raw data. 'No' response to the question concerning the use of prescribed medication received a '1' while a '2' was assigned to 'Yes' responses.

The life events scale was scored by summing the number of times each event had occurred in the past 12 months. Thus a high score indicated a large degree of life event change in the individual's life. Questions concerning a change in general health, leisure activity, and social network in the past 12 months were scored such that 'No' responses received a '1' while a '2' was assigned to 'Yes' responses.

The social network scale yielded 17 separate scores. One score indicated the total number of contacts. Four other scores indicated the number of each one of the following four types of relationships the participants had contact with: (1) family, (2) nonfamily, (3) friends, and (4) social service and health service providers. The mean frequency of contact with the members of the social network

was calculated by adding up the separate ratings of frequency of contact, for each type of relationship, divided by the number of people in the particular category of type of relationship. Importance of relationship was scored by summing the importance ratings for each of the four types of members of the social network and dividing by the number of people in the particular category of relationship. Thus high scores indicate a high degree of importance attached to the relationships. The score for satisfaction with the relationships is calculated in the same manner, with high scores indicating a high degree of satisfaction with the relationships. (See Appendix L for a copy of the coding book for the complete questionnaire.)

Confidentiality and Feedback During the initial telephone contact, asking for their cooperation, participants were assured of confidentiality for all information they would provide to the experimenter. Participants were also asked to sign a consent form included with the questionnaire, agreeing to participate in the study with the understanding that all information is confidential. To insure confidentiality code numbers appeared on the questionnaire and AGE test score sheets. This procedure required a master list of participant names and corresponding code number to allow appropriate matching of AGE test scores and completed questionnaires. The master list was destroyed at the completion of statistical analysis.

A three page summary of the purpose and findings of the study was sent to the participants after analysis was completed. The summary included only group performance data, as performance by individual participants was not released to anyone. Participants were also provided with a telephone number to call the experimenter if they wish to discuss any aspect of the study, apart from their own performance. The National Defense Headquarters received a copy of the completed thesis and raw data. The raw data was presented in a format that did not allow identification of individual participants.

Analyses Pearson Product-Moment correlations were employed to test the hypotheses concerning the relationships between general health scores, importance and satisfaction in the subjects' social network, frequency and enjoyment of leisure activities and life event scores. Similarily, Pearson r correlations were employed to test the hypotheses concerning the strength of the association of body age scores with importance and satisfaction in the subjects' social network, frequency and enjoyment of leisure activities and life event scores.

Randomized two group design t-tests were used to examine differences in the occurrence of change in social network and leisure activity over the past 12 months between subjects reporting good health and those reporting poor

health. A t-test was used to test the hypothesis that those in good health had less contact with social and health service providers than those in poor health. The two groups were created by dividing subjects scoring below the group mean on the general health questionnaire into the group reporting good health and those who scored above the mean into the group reporting poor health. Similarily, randomized two group design t-tests were used to test hypotheses concerning differences between subjects with low body ages and those with high body ages for changes in social network and leisure activity over the past 12 months. Two multiple regressions were constructed to examine the variance in each of the dependent variables accounted for by the combined independent variables.

In order to examine the hypothesized differences between subjects who retired in 1981 and those who retired in 1976, six between group t-tests were employed. This allowed the experimenter to test the hypothesized differences in general health and body age between the two groups. The remaining four between group t-tests tested differences between the two groups for changes in their social network, leisure activity, health and differences in their life event scores.

Results

Pretest In order to calculate the Pearson r correlations for the test-retest reliability the Pearson r correlation programme from the Statistical Package for the Social Sciences (SPSS) (Nie, Hull, Jenkins, Steinbrenner and Bent, 1975) was employed. The results indicated an impressive test-retest reliability for the questionnaire. With regard to the leisure activity scale a correlation of r= .92 was obtained for the frequency of activity involvement. The leisure enjoyment portion of the leisure activity scale yielded a test-retest correlation of r= .94. The additional question concerning change in activity level over the past year secured a perfect correlation, r= 1.00. The life event scale yielded a test-retest correlation of r= .62.

Table 1 contains the test-retest correlations for the general health scale. As with the leisure activity scale the general health scale proved to be highly reliable with correlations ranging from r= .87, for the overall general health score, to r= 1.00, for the use of prescribed medication and occurrence of health change in the past 12 months. Correlations could not be calculated for the two questions regarding hospitalization because none of the participants in the pretest group had experienced this event within the past year.

Table 1

Test-retest Correlations for the General Health Scale

	r	alpha level
Total General Health	.8713	$p < .001$
Number Days Ill	.9789	$p < .001$
Visits to Doctor	.9775	$p < .001$
Hospitalized with Surgery	99.00	N/A
Hospitalized no Surgery	99.00	N/A
Prescribed Medication	1.00	$p < .001$
Health Change	1.00	$p < .001$
Type of Illness	.9167	$p < .001$

The outcome of the test-retest correlations for the social network scale is shown in Table 2. The social network scale proved to be reliable with test-retest correlations ranging from r= .43 , for frequency of contact with friends, to r= .99, for the number of nonfamily members in the social network. The relatively low correlation for the frequency of contacts with friends may have resulted from a change in school work load for the participants resulting in an alteration in the frequency of contact with friends during the week between testing sessions.

Cronbach's alpha was generated as a measure of validity for the general health, social network and leisure activity scales (Hull and Nie, 1981). The analysis was performed on the data collected during the first pretest completion of the questionnaire. Cronbach's alpha test of the leisure activity scale yielded an alpha of .89, indicating a fairly high degree of validity within the scale. The social network scale produced an alpha of .77. Although this is only a moderate alpha, it does suggest that the social network scale created for the study has internal validity. Cronbach's alpha test for the general health scale (without the questions concerning hospitalization which no one answered) was only .55. This indicates a low degree of inner validity, suggesting that the questions in the scale do not address themselves to the identical conception of

Table 2

Test-retest Correlations for the Social Network Scale

	Number	Frequency	Importance	Satisfaction
Family	.9376*	.9553*	.7552*	.8250*
Nonfamily	.9856*	.8677*	.8662*	.9167*
Friends	.7881*	.4311**	.7987*	.8486*
Social Service and Health Providers	.8882*	.6070***	.7262*	.8479*
Total Social Network	r = .8964*			

* $p < .001$

** $p < .054$

*** $p < .008$

health. Questions concerning the occurrence of change in general health and leisure activity were excluded from the Cronbach's alpha analysis because they were not a part of the original scale.

Main Study In order to perform the necessary calculations to analyze the data appropriate programmes were employed from the SPSS manual (Nie et al., 1975). The .05 level of confidence was used in the establishment of significance for the t-tests between independent samples. Although the numerous t-tests conducted in the present study would normally warrant the use of a high level of confidence, the exploratory nature of the present study justifies the use of the .05 level.

Perhaps the most appropriate hypothesis to begin with is the ninth hypothesis which predicted that 1981 retirees would have higher body age and general health scores, more change in their health, social network, and leisure activity, and higher scores on the life events scale than those who retired in 1976. Table 3 contains the outcome of the series of t-tests for independent samples performed to test the final hypothesis. The two groups of retirees did not differ with respect to body age, general health scores, and life event scores. Although retirees from 1981 had a higher mean score on the question concerning health change in the past 12 months (M= 1.33, SD= .48) than the retirees from 1976 (M= 1.00, SD= .00) this difference only approached

Table 3

Results of the *t*-tests for the Comparison of the 1981 and 1976 Retiree Groups; With Respect to Body Age, General Health, and Changes in Health, Activity Level and Social Network, and Life Events Scores

Variable	Year Retired	Mean	Standard Deviation	*T*-test	df	alpha level
Body Age	1981	36.40	12.28	.94	36	*p*= .352*
	1976	40.75	8.07			
General Health	1981	21.73	5.17	1.38	36	*p*= .176*
	1976	24.63	5.66			
Change in Health	1981	1.33	0.48	1.95	36	*p*= .059*
	1976	1.00	0.00			

*$t(30)p = .05 = 2.042$

Table 3 (continued)

Results of the T-tests for the Comparison of the 1981 and 1976 Retiree Groups, With Respect to Body Age, General Health, and Changes in Health, Activity Level and Social Network, and Life Events Scores

Variable	Year Retired	Mean	Standard Deviation	T-test	df	alpha level
Change in Social Network	1981	1.55	0.51	2.23	35	p= .032**
	1976	1.13	0.35			
Change in Activity	1981	1.57	0.50	2.32	36	p= .026*
	1976	1.13	0.35			
Life Events Scores	1981	14.77	11.50	0.08	36	p= .939*
	1976	14.38	16.88			

*t(30)p= .05 = 2.042

significance , ($t(36) = 1.95$, $p = .059$*). However, the 1981 group reported the occurrence of change in their social network, $t(35) = 2.23$, $p = .032$*, and leisure activity, $t(36) = 2.32$, $p = .026$*, significantly more often than those retiring in 1976.

The first hypothesis predicted that general health ratings would be negatively correlated with ratings of importance and satisfaction of the relationships within the individuals' social network. Results of the Pearson r correlations performed to test the first hypothesis are revealed in Table 4. An examination of Table 4 indicates that the first hypothesis is not supported by the data. That is, general health is only weakly related to ratings of importance and satisfaction of relationships within the participants social network. Although five of the correlations were in the predicted direction, the largest of these, between general health and importance of nonfamily members, was only $r = -.29$, ($r^2 = .0831$). The coefficient of determination ($r = .0831$) indicates that only 8.31 percent of the variation in the importance rating is associated with variation in general health scores. Three of the correlations were in the opposite direction to that predicted; general health with importance of family members ($r = +.16$, $r^2 = .0241$), importance of social service and

*$t(30)p = .05 = 2.042$

Table 4

Pearson Correlations and Coefficients of Determination for General Health with Importance and Satisfaction of Relationships *

		Importance of Family	Importance of Nonfamily	Importance of Friends	Importance of Social Service and Health Providers
General Health	r	+ .1552	- .2883	- .1031	+ .2220
	r^2	.0241	.0831	.0106	.0492

		Satisfaction of Family	Satisfaction of Nonfamily	Satisfaction of Friends	Satisfaction of Social Service and Health Providers
General Health	r	- .0782	- .1204	+ .0426	- .2279
	r^2	.0061	.0145	.0018	.0519

*$p > .05$ for all correlations.

health providers ($r = +.22$, $r^2 = .0492$) and satisfaction of friends ($r = +.04$, $r^2 = .0018$).

The second hypothesis stated that general health ratings would be negatively correlated with ratings of frequency and enjoyment of leisure activities. The data supported this hypothesis in that the correlations were in the predicted direction, however these correlations were very weak. General health scores were negatively correlated with leisure activity frequency ($r = -.22$, $r^2 = .0495$) and leisure activity enjoyment ($r = -.04$, $r^2 = .0015$). Therefore, it appears that variation in the general health score is associated with only 4.95 percent of the variation in leisure activity frequency scores and 0.15 percent of the variation in leisure activity enjoyment scores.

The prediction that general health ratings would be positively correlated with scores on the life events scale constituted hypothesis three. Both the direction and magnitude of the correlation between general health and scores on the life events scale support the third hypothesis. General health scores were positively correlated with life events score, $r = .45$, $r^2 = .2036$. Therefore, variation in general health scores were associated with 20.36 percent of the variation in scores on the life events scale.

The fourth hypothesis stated that participants with low scores on the general health scale would have fewer contacts with social service and health providers, less change in their social network and leisure activity and fewer life events than those with high scores on the general health scale. The *t*-tests results for the fourth hypothesis are shown in Table 5. The data indicate that individuals scoring below the overall mean on the general health scale (M= 22.34, SD= 5.33) did not indicate fewer changes in their social network, or leisure activity, than those scoring at or above the mean. Those with perceived good health (low scores on the general health scale) did not have fewer contacts with social service and health providers than those in subjectively perceived poor health (high scores on the general health scale). Those participants who indicated poor health had significantly higher life events scores than those who reported good health, $t(36)= 2.58$, $p= .014$*. However, it should be noted that the standard deviation for the mean life events score of the high general health score group (M= 19.58) was 14.75, while the standard deviation for the mean life events score of the low general health score (M= 9.79) was only 7.48. Therefore it would appear that those in subjectively perceived poor health have a larger degree of variation in life events occurrence than those in

*$t(30)p= .05 = 2.042$

Table 5

Results of the T-tests Comparing Participants in Perceived Good Health to those in Perceived Poor Health; With Respect to Change in Social Network, and Activity Level, Number of Contacts with Social Service and Health Providers, and Life Events Scores

Variables	Group	Mean	Standard Deviation	T-test	df	alpha level
Change in Social Network	Poor Health n=18	1.39	0.50	.82	35	p= .416*
	Good Health n=19	1.53	0.51			
Change in Activity Level	Poor Health n=19	1.58	0.51	1.29	36	p= .204**
	Good Health n=19	1.37	0.50			

*t(30)p= .05 = 2.042

Table 5 (continued)

Results of the T-tests Comparing Participants in Perceived Good Health to those in Perceived Poor Health; With Respect to Change in Social Network, and Activity Level, Number of Contacts with Social Service and Health Providers, and Life Events Scores.

Variables	Group	Mean	Standard Deviation	T-test	df	alpha level
Number of Contacts with Social Service and Health Providers	Poor Health n=19	0.21	0.42	.86	36	p= .397**
	Good Health n=19	0.37	0.68			
Life Events Scores	Poor Health n=19	19.58	14.75	2.58	36	p= .014**
	Good Health n=19	9.79	7.48			

*t(30)p= .05 = 2.042

subjectively perceived good health.

The fifth hypothesis predicted AGE test scores would be negatively correlated with importance and satisfaction with relationships . Table 6 contains the results of the Pearson r correlations performed to examine the fifth hypothesis. Only four of the eight correlations were in the predicted direction, they were body age score with importance of nonfamily members ($r= -.25$, $r^2= .0632$), importance of social service and health providers ($r= -.17$, $r^2 = .0293$), satisfaction with nonfamily members ($r= -.04$, $r^2= .0018$) and satisfaction with friends ($r= -.15$, $r^2 = .0226$). The remaining correlations were in a positive direction, however, they were extremely weak, as were the four correlations which followed the predicted negative relationship.

The prediction that AGE test scores would be negatively correlated with ratings of frequency and enjoyment of leisure activity formed the sixth hypothesis. Body age was found to be negatively correlated with leisure activity frequency ($r= -.21$, $r^2 = .0420$) and leisure activity enjoyment ($r = -.21$, $r^2 = .0421$). However, as the coefficients of determination indicate, the relationships are very weak with variation in body age scores being associated with 4.20 and 4.21 percent of the variation in leisure activity frequency and enjoyment, respectively.

Table 6

Pearson Correlations and Coefficients of Determination for Body Age with Importance and Satisfaction of Relationships *

		Importance of Family	Importance of Nonfamily	Importance of Friends	Importance of Social Service and Health Providers
Body Age	r	+ .1221	- .2514	+ .1047	- .1712
	r^2	.0144	.0632	.0110	.0293

		Satisfaction of Family	Satisfaction of Nonfamily	Satisfaction of Friends	Satisfaction of Social Service and Health Providers
Body Age	r	+ .0913	- .0425	- .1504	+ .1410
	r^2	.0083	.0018	.0226	.0199

* $p > .05$ for all correlations.

AGE test scores were predicted to be positively correlated with scores on the life events scale. The results did not support this hypothesis, unlike general health, body age scores were unrelated to the occurrence of life events, $r = -.02$, $r^2 = .0005$. In a similar fashion, body age and general health scores appear to be poorly correlated, $r = +.06$, $r^2 = .0035$. Therefore, only 0.35 percent of the variation in body age scores is associated with variation in the general health scores.

Participants with low AGE test scores were predicted to have had less change in their social network and leisure activity and lower scores on the life events scale than those with high AGE test scores. Initially it was proposed to compare those scoring below their chronological age on the AGE test with those who had a body age above their chronological age. However, within the present group of participants only three people had a body age score over 5.10 years older than their chronological age. Twenty people had a body age score ten or more years younger than their chronological age. Ten participants obtained a body age within plus or minus five years of their chronological age. The plus or minus five year range coincides with one standard deviation of the AGE test (Morgan, 1981). Morgan (1981) considered a body age score within one standard deviation of chronological age to indicate the person's physical age was comparable to their chronological age.

Five participants had body age scores between -5.10 and -9.99 years of their chronological age. The contents of Table 7 indicate the absolute and relative frequency of body age as described above.

Therefore, as a result of the data's nature, it was considered more appropriate to compare only those participants with body age scores ten years or younger than their chronological age to those participants whose body age score was within one standard deviation (+/- 5 years) of their chronological age.

Table 8 contains the results of the t-test for independent samples between the two body age score groups with respect to change in social network and leisure activity and occurrence of life events within the past 12 months. A review of Table 8 reveals that participants with a body age score at least ten years younger than their chronological age did not differ from those whose body age score was within one standard deviation of their chronological age with regard to change in social network, and leisure activity, or the occurrence of life events. Therefore, hypothesis eight did not receive support in the present study.

The relationship between the dependent and independent variables was further explored by conducting two Forward Multiple Regression analyses. In the first regression

Table 7

Absolute and Relative Frequencies for the Body Age Score Groups

	Body Age Group	Absolute Frequency	Relative Frequency
1	10 years or younger	20	52.60
2	-9.9 to -5.1	5	13.20
3	-5.0 to +5.0	10	26.30
4	+5.1 to +9.9	2	5.3
5	10 years or older	1	2.6
		38	100

Table 8

T-test Results Comparing Body Age Group 1 to Body Age Group 2; With Respect to Change in Activity Level and Social Network, and Life Events Scores

Variable	Body Age Group	Mean	Standard Deviation	T-test	df	alpha level
Change in Activity Level	1	1.50	0.51	0.00	28	p= 1.00*
	3	1.50	0.52			
Change in Social Network	1	1.47	0.51	1.15	27	p= .260**
	3	1.70	0.48			
Life Events Scores	1	13.10	14.98	1.13	28	p= .270*
	3	19.00	9.81			

* $t(28)p= .05 = 2.048$

** $t(27)p= .05 = 2.052$

leisure activity frequency , leisure activity enjoyment, life events, total social network, and general health were regressed on body age. The multiple regression summary table is contained in Table 9. This computation yielded the following regression equation: body age= 46.81 + .088 (general health) - .069 (leisure activity enjoyment) + .062 (total social network) - .030 (leisure activity frequency) + .023 (life events). A review of the R square and R square change scores in Table 9 indicates body age scores are not influenced by changes in leisure activity enjoyment or frequency, life events, total social network, or general health. This conclusion is supported by the fact that the regression analysis did not reach significance, $F(5, 31)= .31413$, p .05 ****.

The multiple regression analysis for general health was found to be significant, $F(5, 31)= 2.61$, p .05****. Table 10 contains the summary table for this multiple regression. Life events scores and leisure activity enjoyment appear to be strongly associated with changes in general health scores. Leisure activity frequency and total social network were also involved in determining the variation in general health scores but to a lesser extent. As before, body age appears to be unrelated to general health for this sample.

****$F(5, 30)p= .05 = 2.53$

Table 9

Multiple Regression Summary Table with Body Age as the Dependent Variable

Variables	Multiple R	R square	R square change	Pearson r to Body Age *
Leisure Activity Frequency	.20506	.04205	.04205	- .20506
Leisure Activity Enjoyment	.21173	.04483	.00278	- .20518
Life Events	.21349	.04558	.00075	- .02330
Total Social Network	.21695	.04707	.00149	- .03654
General Health	.21960	.04822	.00115	+ .05910

* $p > .05$

Table 10

Multiple Regression Summary Table with General Health as the Dependent Variable

Variable	Multiple R	R square	R square change	Pearson r to General Health
Leisure Activity Frequency	.22248	.04950	.04950	- .22248
Leisure Activity Enjoyment	.39434	.15551	.10601	- .03866
Life Events	.51387	.26407	.10856	+ .45128
Total Social Network	.54375	.29566	.03159	- .24108
Body Age	.54453	.29651	.00085	+ .05910

* $p < .05$

The multiple regression yielded the following regression equation: general health= 27.52 + .17 (life events) + .11 (total social network) - .083 (leisure activity frequency) + .029 (leisure activity enjoyment) + .014 (body age).

Discussion

Results from the present study tend not to give convincing support for the nine hypotheses stated at the outset. Differences between the two retirement groups were predicted based on the findings of Haynes et al. (1977, 1978), Giffen and McNeil (1967) and McNeil and Giffen (1967). The 1981 retirees were expected to report more changes in their social networks, leisure activity and health, have more life events, poorer health and higher body ages than the 1976 group. The predicted differences were attributed to the recent stress of retirement. However, 1981 retirees were found to have experienced more change only in their social networks and leisure activities than those retiring in 1976.

A review of the participants' description of the change (if one occurred) in their social network and leisure activity revealed both negative and positive changes.

Retirees from 1981 reported expanded social networks as a result of new contacts at their new civilian jobs. Those who reported decreased social networks attributed the change to the loss of contact with former military co-workers coupled with a failure to establish new civilian acquaintances. Perhaps the most common reported reason for change was relocation after release from the military. The new location was often a great distance from their last military posting. The 1976 retirees who expressed changes in their social network tended to report increases in their social contacts.

In a similar fashion changes in leisure activities for the 1976 retirees tended to involve increased activity. The 1981 retiree group , which reported more change, indicated both positive and negative changes in their leisure activity level. Some retirees reported increased involvement in civilian organized athletic activities and social functions (i.e. church choirs). Other 1981 retirees indicated a decline in activities as a result of failure to become involved after relocation following discharge from the military. One participant indicated a decline in activity as a result of surgery.

The two retirement groups did not differ with respect to general health, body age, or life events. It was predicted that the general health of the 1981 retirees would be worse than that of people retiring in 1976. Giffen and McNeil

(1967) and McNeil and Giffen (1967) described a retirement syndrome for military personnel involving both psychological and physical problems, prior to and immediately after retirement. The retirement syndrome was not apparent in the present sample of retired military personnel. Haynes et al. (1978) reported higher mortality rates for retired lower status employees, within the first two years of retirement, than high status employees. The higher status employees had an increased mortality rate over the lower status employees, six years after retirement. The general health scores indicated no difference between the two retiree groups, however all participants were former noncommissioned officers and did not differ in job status to the extent seen in Haynes' et al. (1978) sample. Further research with retired military personnel should attempt to compare ranks such as noncommissioned with commissioned officers, or officers with enlisted personnel. A further improvement over the present study would be to obtain military medical records for the participants. This would allow for comparison of participants in poor health with those in good health prior to retirement and with their respective post retirement health situation. This improvement, to include prior health information, was suggested earlier by McKenzie (1980) and Friedmann and Orbach (1974).

Wan and Weissert (1981), Winnubst et al. (1982), Dohrenwend and Dohrenwend (1978), Streib (1965) and Carveth

and Gottlieb (1979) noted the importance of involvement with a supportive social network in successfully coping with stressful events and preventing physical illness. The present study failed to establish strong support for this notion. Subjectively perceived good health was related minimally to high ratings of importance and satisfaction with the relationships within the participants social network.

Importance ratings of family and social service and health providers were opposite to prediction, indicating high importance for these members of the social network was related to subjectively perceived poor health. At first these results seem to contradict the logically expected relationship between health and social network; however, Carveth and Gottleib's (1979) study yielded a similar finding. They concluded that people in need of help, either psychological or physical, increased contact with the social network members whom they believed best able to deal with their problems or needs. Although Carveth and Gottlieb (1979) did not study importance of relationships, the possibility exists that relationships for those in poor health are seen as more important, as they are relied on for social support (in the case of family members) or medical aid (in the case of social service and health providers).

However, the correlations between general health and satisfaction of relationships did not coincide with the

correlations for importance of relationships. This may indicate a conceptual difference between the importance and satisfaction components of relationships. Further exploration is needed of the role these two aspects of relationships play in the occurrence and resolution of health problems. The current findings, with regards to social network, support the suggestion by Haynes et al. (1978) and Dyson (1980) to study various aspects of the relationships within the individuals' social network.

As predicted from the research of Foner and Schwab (1981) and Friedmann and Orbach (1974) the enjoyment and frequency of leisure activity was related to subjectively perceived good health. However, as with the social network data, these relationships were very weak in magnitude. The possible importance of leisure activity with regards to general health was indicated in the multiple regression analysis. Leisure activity enjoyment was found to be a main contributor to the variation of general health scores. Future research should expand on the component of leisure activity; including an analysis of participation in solitary or group activities. Answers by a few of the participants to the open ended questions concerning change in activity and social network revealed a decrease in involvement with Officers Club activities, either stopping their membership, or attending fewer social events yet maintaining the membership. Two of the participants still work for

National Defense as civilian employees. Perhaps a future study should record the degree of involvement with the military community after retirement. Post retirement contact with the military may be related at some level to adaptation to retirement.

The prediction receiving the strongest support concerned the relationship between general health and the occurrence of life events. McKenzie (1980), Friedmann and Orbach (1974) and MacBride (1976) stressed the importance of measuring the life events occurring in the participants life apart from retirement. Within the present study, life events were positively correlated with general health scores. This follows the predictions of Holmes and Rahe (1967), Paykel et al. (1971) and Dohrenwend and Dohrenwend (1978) that life events are related to poor health, or increased illness. Those in subjectively perceived poor health experienced significantly more stress than those in subjectively perceived good health. However, the group of participants categorized as in subjectively perceived 'poor health' showed a large degree of within group variation. This large degree of variation in reporting life events, suggests the relationship between life events and poor health needs further exploration.

Haynes et al. (1977) urged the use of a physiological measure in place of subjectively rated questionnaires. The present study employed the AGE test (Morgan, 1981) to test

the reaction of participants physiological age to the stress of retirement. Results of the present study failed to support all predictions concerning body age scores. Body age was found to be unrelated to the occurrence of life events, and only barely related to importance and satisfaction of relationships.

The relationships between body age and importance and satisfaction of social network did not follow the same pattern as with general health. As noted previously, Carveth and Gottleib (1979) suggested that people in a state of need increased their contacts with members of their social network. High body age (indicating a possible negative reaction to stress) was related to a high rating of importance for family and friends in the social network. High ratings for satisfaction of relationships with family members and social service and health providers were related to poor health. The satisfaction and body age relation was opposite to that found between general health and satisfaction. Combining the findings between both general health and body age and the relationship to importance of social network members, it is apparent that family members play an intricate part when the person is experiencing poor health. This appears to be true, to a lesser extent, for both friends and social service and health providers. Perhaps future research should conduct follow-up body age test sessions to compare change in body age related to change in aspects of the person's social network.

Leisure activity frequency and enjoyment were weakly correlated in the predicted negative direction with body age. This suggests that younger body ages may be related to a high frequency of involvement in and enjoyment of activities, however more research is needed to explore the full extent of the relationship. The research should follow the same line as suggested earlier for general health, namely examine the type of activity in order to discern whether it is a solitary or group activity.

The *t*-tests between the group of participants with body age scores ten or more years younger and those with scores within five years of their chronological age produced nonsignificant results. The younger group was found not to differ from the 'same age' group with respect to the occurrence of changes in their social network or leisure activities, or in their life events scores. It would appear that general health is more strongly related to, and affected by, leisure activity, social network and life events than body age. Superficially, this might be interpreted to indicate that the AGE test (Morgan, 1981) is not sensitive enough to physiological differences between high and low levels of leisure activity, components of social networks, or life events. Acceptance of this conclusion would be an error in interpreting the data from the present study.

It should be noted that in the current study only three participants were over five years older in body age than their chronological age. Over half of the participants were ten years or younger than their chronological age. Another quarter had body ages that were almost identical to their birth age. Therefore, the present sample failed to allow for a true examination of differences between a significantly younger and significantly older group of participants with respect to leisure activity, social network, or life events. The three scales used to measure the independent variables might have lacked the sensitivity to reveal differences between those whose body age is the same as their birth age and those whose body age is significantly younger.

The overall weakness of nearly all relationships found in the present study may be a result of several characteristics of the sample of participants. Only 38 of the 147 possible participants actually took part in the study. Although this constitutes a respectable return rate for mailed requests, future studies should devise a method of enlistment to recruit a larger number of participants. Perhaps this could be accomplished by approaching military personnel just prior to their release from the military, and if possible making this first contact in person. As a result of the small sample size, the present relationships may be weaker than they actually are in the population from which the sample was drawn.

However, the most influential aspect of the study which may have helped to lower the magnitude of the findings, was depicted in the body age scores. It would appear that a majority of the participants were in good to excellent health. Therefore, the 38 participants may have responded to the experimenters request for volunteers in a study dealing with general health and physical age, because they knew they were healthy. These men were willing to take the risk of possibly receiving information that they were in poor health, because they knew this was an unlikely possibility. Participation may have resulted from the individuals' desire to receive feedback concerning their physical health, which they attempt to maintain at a high standard. Whether either of these reasons are correct, it appears that some subject self-selection occurred in the present study. Therefore, those people who are in extremely poor health, or who wish not to receive any information concerning their physical condition, did not participate.

Another potential group of retired military personnel which the present study missed are those men who severed all connections with their past military careers. However, this group is a hypothetical one, for the present study did not reveal any indication that retired military personnel wished to totally disassociate themselves from their military past. On the contrary, many of the participants, during post AGE testing informal conversation, expressed fond memories of

the service and occassionally a sense of grief over the loss of commradeship they had in the military. However, some retired personnel expressed disappointment in the military's pre-retirement preparation programmes. Whether this accusation is accurate can not be assessed by the present study, but should be appraised by future research.

In summary, the present study found evidence of general health being related to the importance and satisfaction of relationships and leisure activity frequency and enjoyment. However, the actual extent of these relationships requires further exploration. The occurrence of life events were found to be related fairly strongly with general health. With regards to body age the findings suggested a need to contrast AGE test results of a group who are significantly younger with a group who are significantly older. Only then could conclusions be reached on the effects of social network, leisure activity, and life events on early retirement adjustment as measured by physical aging.

Employing the methodological considerations mentioned above, future research should attempt to increase the sample size, include a comparison of military personnel of different ranks, and pre-retirement health status. As suggested by Carveth and Gottlieb (1979), further study should involve a long term follow-up to assess the changing role of social network components and leisure activity in blunting the effects of retirement stress on general health

and physical aging. The quest for the answers to the questions raised by the present research has only begun.

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APPENDIX A

PARTICIPANT CONSENT FORM

Consent to Participate Form.

Please read the following statement and if you agree to participate sign on the line marked 'Participant' and indicate the date. Then, print your name and the telephone number where I can reach you in the space provided. There are two copies of this form, I would like you to keep one and return the other in the enclosed stamped addressed envelope, if you have not contacted me by telephone.

I agree to participate in this study with the understanding that all information will be kept confidential and will not be released under any circumstance.

Participant: _____

Date: _____

Researcher: Tom Wilson

(Please print)

Name: _____

Telephone number: _____

APPENDIX B

TYPE I LETTER TO POTENTIAL PARTICIPANTS

Tom Malcomson,
Department of Psychology,
Wilfrid Laurier University,
Waterloo, Ontario,
January 28, 1982.

Dear Sir:,

I am a graduate student at Wilfrid Laurier University, in Waterloo, working on my Masters of Art degree in Psychology. Currently I am writing a thesis concerning retirement. I am interested in the relationships between the social contacts, leisure activities, the occurrence of life events in the past year, general health and physical age of men who retired from a career between the ages of 38 and 55 years. As a former member of the Canadian Armed Forces you have experienced the form of retirement in which I am interested.

At this point you are probably wondering how this letter came to arrive at your home. In November of 1981 I forwarded a detailed description of my proposed study to the National Defense Headquarters in Ottawa for review. At the end of December, 1981, Major Ellis of the Directorate of Personnel Research of the Armed Forces notified me that the military had approved my research and were willing to cooperate in the collection of data. The vital role which the National Defense Headquarters has played, is one of acting as a post office. In order to protect your confidentiality they did not release names and addresses of retired personnel to me. I sent a package of stamped, unaddressed envelopes, all containing materials identical to this one, they put the address label on and then mailed the envelopes.

If you participate in the study you will complete, on your own at home, a short questionnaire dealing with your social contacts, leisure activities, recent life events, general health and some background information. To ascertain your physical age we will have to meet at a mutually convenient time, at a location close to where you live. Physical age is assessed by using the Adult Growth Examination (AGE), which involves taking readings of your systolic blood pressure, a test of near point vision and high frequency hearing. The administration of the AGE takes 15 to 20 minutes.

All information will be kept strictly confidential. The thesis that I write, based on the results, will not contain any information that could possibly identify anyone who participated in the study. A copy of the thesis will be sent to the National Defense Headquarters in return for their help in mailing out the envelopes. When the data has been analyzed I will send a three page summary of the results to all those who participated.

If you wish to participate in my study, either call the Department of Psychology at Wilfrid Laurier University, (519-884-1970, Ext. 371) and leave your name and number with the secretary, and I will call you back, or send the enclosed, stamped envelope, whichever is more convenient for you. I will then contact you and arrange a mutually convenient time and place for the administration of the AGE. When we meet for the AGE test I will give you the questionnaire to take home and complete at your leisure. When you have completed the questionnaire you can return it to me by mailing it in the stamped, addressed envelope that I will provide.

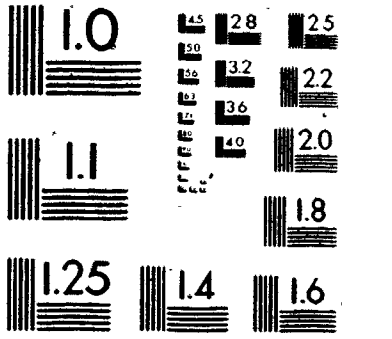
If you would like to ask a few questions before deciding whether to participate please contact me at the above telephone number at Wilfrid Laurier University.

Thank you for your time and consideration.

Yours truly,

Tom Malcomson.

[redacted]



APPENDIX C

TYPE II LETTER TO POTENTIAL PARTICIPANTS

Tom Malcomson,
Department of Psychology,
Wilfrid Laurier University,
Waterloo, Ontario,
January 28, 1982.

Dear Sir:,

I am a graduate student at Wilfrid Laurier University, in Waterloo, working on my Masters of Art degree in Psychology. Currently I am writing a thesis concerning retirement. I am interested in the relationships between the social contacts, leisure activities, the occurrence of life events in the past year, general health and physical age of men who retired from a career between the ages of 38 and 55 years. As a former member of the Canadian Armed Forces you have experienced the form of retirement in which I am interested.

At this point you are probably wondering how this letter came to arrive at your home. In November of 1981 I forwarded a detailed description of my proposed study to the National Defense Headquarters in Ottawa for review. At the end of December, 1981, Major Ellis of the Directorate of Personnel Research of the Armed Forces notified me that the military had approved my research and were willing to cooperate in the collection of data. The vital role which the National Defense Headquarters has played, is one of acting as a post office. In order to protect your confidentiality they did not release names and addresses of retired personnel to me. I sent a package of stamped, unaddressed envelopes, all containing materials identical to this one, they put the address label on and then mailed the envelopes.

If you participate in the study you will complete, on your own at home, a short questionnaire dealing with your social contacts, leisure activities, recent life events, general health and some background information. To ascertain your physical age we will have to meet at a mutually convenient time, at a location close to where you live. Physical age is assessed by using the Adult Growth Examination (AGE), which involves taking readings of your systolic blood pressure, a test of near point vision and high frequency hearing. The administration of the AGE takes 15 to 20 minutes.

All information will be kept strictly confidential. The thesis that I write, based on the results, will not contain any information that could possibly identify anyone who participated in the study. A copy of the thesis will be sent to the National Defense Headquarters in return for their help in mailing out the envelopes. When the data has been analyzed I will send a three page summary of the results to all those who participated.

If you wish to participate in my study please complete the enclosed questionnaire. Then, either call the Department of Psychology at Wilfrid Laurier University, (519-884-1970, Ext. 371) and leave your name and number with the secretary, and I will call you back, or send the enclosed consent form in the enclosed stamped envelope, whichever is more convenient for you. I will then contact you and arrange a mutually convenient time and place for the administration of the AGE.

If you would like to ask a few questions before deciding whether to participate please contact me at the above telephone number at Wilfrid Laurier University.

Thank you for your time and consideration.

Yours truly,

Tom Malcomson.

APPENDIX D

REMINDER LETTER

Tom Malcomson
Department of Psychology
Wilfrid Laurier University
Waterloo, Ontario
March 16, 1982.

Dear Sir:

Approximately three weeks ago you received a package of information from me via the National Defense Headquarters in Ottawa. I am still attempting to obtain participants for my study on retirement from the military. If you are willing to participate could you please complete the consent form and return it to me in the stamped envelope enclosed in the original package I sent to you.

If you have any questions before deciding whether to participate, or misplaced the original package, you can call the Department of Psychology at Wilfrid Laurier University (519 884-1970, Ext. 371), leave your name and number, and I will return your call.

Thank you for your time and help.

Yours truly,

Tom Malcomson.

APPENDIX E

ADULT GROWTH EXAMINATION MANUAL

Part I. Directions for administration and scoring

You do not have to be a psychologist or a physician to give the Adult Growth Examination (AGE). On the other hand, you may well wish to consult with such professionals to interpret any results significantly different from normal from the calendar age. What you do need to give this test effectively is highly practiced familiarity with the test materials and careful adherence to the test instructions. Courses in psychological testing, assessment of adult aging, and gerontology would also be helpful. After sufficient supervised practice, the AGE may be used by any intelligent adult to monitor their body age and the relative aging of friends and family. The test may also be used professionally by psychologists, physicians, mental health workers, nurses, researchers, and other specialists within the health or life sciences.

Test Materials

A complete test kit will include handbook (with manual), portable electronic blood pressure monitor, portable audiometric monitor, portable visual near point indicator and cards, a pack of score sheets, and a carrying case for the equipment.

Portable electronic blood pressure monitor: Battery operated, with solid-state circuitry, it allows accurate rapid measurement without a stethoscope. Cuff microphone, red signal light on instrument panel, monitor panel of at least 2.5" with at least one marked division for every 2 mm/hg.

Portable audiometric monitor: Operates on normal AC wall current, solid-state circuitry, stereo earphones, microphone, variable volume dial (up to 59 dbs by increments of 1 db), two frequences of 1000 cps and

6000 cps. Hearing level tested.

Portable visual near point indicator: Visual target cards with pica type sentence (3 different sentences for 3 different cards), card insert on graded measurement ruler expandable up to 65 inches. Near point of clear focus tested.

Score sheets: pack of one hundred (100).

Time Requirements

Most people can be tested in ten to fifteen minutes on this untimed test. Relaxed accuracy is much more important than speed with AGE.

Administering the Test

General Suggestions:

1. Set up the test equipment in a quiet well illuminated room with ample movement space.
2. The examiner should be relaxed, positive, encouraging, and postpone irrelevant discussion until all measures are completed. Discussion of the test's background, meaning or purpose should also not be done during the actual testing.
3. Directions to the person being examined should be read aloud rather than given from memory. It is useful to have the persons being examined follow the reading of the directions on their own copy.
4. Never rush the person being examined.
5. It is often useful to give the test several times to the same person, say a few days apart and at varying hours. This will determine the individual stability or reliability of the body age score.
6. Significantly high or unusual age results should be referred to a health professional. Persons tested should be told that this test,

like all tests, is subject to error. Results should be carefully double-checked before any serious personal or research decisions are made in consequence. The most frequent use of the test will be for personal knowledge and, as such, it can lead to a greater enjoyment of life if properly used.

7. Before examining anyone on this test, they should know its purpose and should provide their clear approval to be tested. In addition to this informed consent, the examinee is always entitled to the results of the test: transmitted in a clear, comprehensible form. Since confidentiality is promised, it must be honored. Also: no test result is irreversible.

8. The ethical standards, federal and professional, for testing or research with human all apply to this test.

Test Procedure:

A. The person to be tested (examinee) is seated on a comfortable chair next to a table. On the table is the score sheet which is completed as to basic background information at this time.

B. The examiner reads: "YOU ARE ABOUT TO HAVE A SHORT PAINLESS SERIES OF TESTS OF HEALTH MEASURES ASSOCIATED WITH AGING. YOU MAY LET THE EXAMINER KNOW IF THE DIRECTIONS ARE NOT CLEAR BUT OTHERWISE PLEASE HOLD ALL QUESTIONS UNTIL THE TEST SERIES IS OVER. DO I HAVE YOUR CONSENT TO BEGIN?"

C. With consent, the first blood pressure measurement is made. The examiner reads: "THIS WILL BE THE FIRST OF THREE BLOOD PRESSURE

PEADINGS TO BE TAKEN IN THE TEST SERIES." The blood pressure measurement is made with the subject wearing the blood pressure monitor cuff over the bulge in the upper left arm. This places the cuff microphone directly over the brachial artery. The cuff is then plugged into the instrument case, the instrument switched on and the air valve closed by rotating the cap clockwise with thumb and forefinger. The cuff is then inflated by pumping the hand bulb. The light may flash on the control panel while the cuff is moved or inflated: this is caused by noise picked up by the sensitive microphone in the cuff. The red flashing will cease when the inflation is stopped and pressure is above systolic pressure (inflate to about the systolic pressure you would expect at 20 calendar years above the age of the person being tested up to a maximum pressure of 160 mm/hg). The cuff is then slowly deflated by gradually opening the air valve, turning the cap counterclockwise. The first flash on the dial occurs at systolic pressure (the maximum pressure in the arteries when heart is not at rest) and the pressure must be read at exactly that instant. When the reading has been made, let out all the pressure. Leave the cuff loose and uninflated on the left arm. Record the first systolic blood pressure reading on the score sheet. (Note: Corday & Vyden, 1966, have shown that blood pressure will go up 10-30 mm/hg up to 45 minutes after eating; they also found excessively warm rooms to lower blood pressure while excessively cold rooms raise it. It therefore makes sense to test only in a comfortably temperate room and not after examinee has just finished eating.)

D. On to the hearing test. The examiner reads: "NEXT IS A HEARING TEST. PLEASE PUT ON THE EARPHONES. MAKE SURE THEY ARE FIRMLY ON YOUR EARS BUT ARE NOT SO TIGHT AS TO BE PAINFUL." When this is done, the examiner speaks through the portable audiometric monitor's (PAM) microphone and continues: "NOD IF YOU CAN HEAR ME. ALL RIGHT. NOW I WOULD LIKE YOU TO TURN SO THAT YOUR BACK IS TO ME. THIS WILL HELP YOU CONCENTRATE ON THE SOUND IN THE EARPHONES WITHOUT THE DISTRACTION OF SEEING THE TONES TURNED ON. IT ALSO HELPS ME KEEP FROM LETTING YOU KNOW WHEN I AM SOUNDING A TONE." Tune PAM to 1000 cps at 40 db for the right ear. "WHEN YOU HEAR A TONE IN YOUR RIGHT EAR, RAISE YOUR RIGHT HAND ALL THE WAY UP .. LIKE THIS" (sound tone). "WHEN YOU HEAR A TONE IN YOUR LEFT EAR, RAISE YOUR LEFT HAND ALL THE WAY UP .. LIKE THIS" (switch to left ear and sound tone). "GOOD. BE SURE TO RAISE YOUR HAND ALL THE WAY UP ON THE SIDE YOU HEAR THE TONE WHEN YOU CAN HEAR THE TONE. WE ARE NOW READY TO START THE TEST." The frequency is still set at 1000 cps. This is a normal conversation frequency and is not an age measure. It is used to warm up the examinee to the test and to get a rough indication of the quality of normal hearing. It is also a chance to make sure the equipment is in good order. Test first the right ear and then the left. Use one second tones. Begin testing each ear at 50 dbs. If no hand goes up at that level, raise up to 59. If at 59 db, the hand has still not gone up, cut in with the microphone and reread the directions. If still no success, check PAM and see if the examinee has fallen asleep. Most people will raise their arm at 50 db. If so, decrease the volume by gradual steps until you find the volume level so low that the exa-

minee hears it only about half the time. Record that as the hearing level score for each ear. Now do the same for each ear at the age-related high frequency of 6000 cps. The 'better ear' score is the lowest volume in db scored at 6000 cps, whether it is the right or the left ear. Turn off PAM.

E. Time for another blood pressure test. After removing the earphones, the examinee turns in the chair to again face the examiner. When comfortable, examinee is told: "THIS IS THE SECOND OF THREE BLOOD PRESSURE READINGS TO BE TAKEN IN THIS TEST SERIES." Inflate the cuff to about 20 mm/hg higher than the first systolic reading (up to 160 maximum). Take and record the second systolic blood pressure reading. Then, leaving the cuff loose on the left arm, go on to the vision test.

F. The examiner reads: "THIS IS A TEST OF NEAR VISION OR HOW CLOSELY YOU CAN SEE PRINTED MATERIAL WITHOUT ANY BLURRING." One of the three target cards is inserted in the near point indicator (NPI) at the far end from the examinee. Lighting should be excellent and without glare. "LOOK DOWN THE RULER TO THE FAR END WHERE YOU SEE A WHITE CARD. I AM GOING TO MOVE THIS CARD TOWARD YOU UNTIL YOU CAN SEE THE PRINTED LETTERS ON IT CLEAPLY. SAY WHEN. GOOD. NOW I AM GOING TO KEEP MOVING IT TOWARD YOU VERY SLOWLY. TELL ME WHEN IT BEGINS TO BLUR IN ANY WAY. ALL RIGHT. NOW I AM GOING TO MOVE THE CARD AWAY FROM YOU. TELL ME WHEN IT STOPS BLURRING." In this manner, the distance at which the sentence on the card blurs is recorded. No glasses are allowed. Record distance to the nearest tenth of an inch if at all possible. Any one of the three target cards may be used;

Alternatives are for retesting. When done, the examinee is again made comfortable in the chair.

6. The examiner reads: "THIS IS THE THIRD OF THREE BLOOD PRESSURE READINGS TO BE TAKEN IN THIS TEST SERIES." Again inflate the cuff to about 20 mm/hg, higher than the last reading (up to 160 maximum). Take and record the third systolic blood pressure reading. Then, remove the cuff from the examinee's arm and turn off the machine. Make sure all equipment is off. Compute the average of the three systolic blood pressure readings and record that on the score sheet. Thank the examinee for the time and cooperation. Set an appointment for a later date to present and explain the results, once they are determined by converting raw scores to body age scores.

Scoring the Test:

Using conversion tables (which follow) convert the raw score for each subtest into the equivalent age score. Then rank order the three scores. The middle one or median (neither the highest or the lowest) is the tested body age of the examinee. It is your best estimate of the body age at the time of testing. Additional measures, listed in the decade charts following in this manual, may be used as supplementary indicators of aging if available from professional medical, dental, or psychological testing. If for any reason you have been unable to use one of the three basic subtests, average the two body age scores you have measured as the best estimate available of bodily aging (e.g., as with a blind or deaf examinee).

ADULT GROWTH EXAMINATION

Score Sheet

Name _____ Date of Birth _____

Identifying Number _____

Address _____

Telephone _____ Sex _____

Occupation _____ Education _____

Marital Status _____ Referred by _____

Medical Problems _____

I know the purpose of this test and consent to take it of my own free will. I understand the results will be handled in a professional and ethical manner.

_____

Signature and Date

The Examiner: _____

==========

Time test begun _____

Measurements

Body Temperature _____

SBP-1 Systolic blood pressure _____ mm/hg
HL Hearing loss at 1000 cps: Right ear _____ db Left ear _____ db
HL Hearing loss at 6000 cps: Right ear _____ db Left ear _____ db
HL Hearing loss at 6000 cps Better ear _____ db*
SBP-2 Systolic blood pressure _____ mm/hg
NPV Near point of vision _____ inches*
SBP-3 Systolic blood pressure _____ mm/hg
SBP Average of three readings _____ mm/hg*

Time test concluded _____ Total testing time _____ minutes

==========

Results

*HL raw score _____ HL age score _____ BODY AGE _____
*NPV raw score _____ NPV age score _____ BIRTH AGE _____
*SBP raw score _____ SBP age score _____ Difference _____

==========

The ADULT GROWTH EXAMINATION was developed by Dr. Robert Morgan, Department of Psychology, Wilfrid Laurier University, Waterloo, Ontario N2L 3C5. Research results and individual score sheets are welcome.

TABLE 3

Conversion Table: Hearing Loss HL Raw Scores to Body Age Scores

Hearing Loss HL in decibles	Men: Body Age in years	Women: Body Age in years
0	19-	20
1	19-	23
2	19-	25
3	19-	27
4	20	29
5	21	32
6	22	35
7	24	39
8	25	41
9	27	44
10	28	45
11	29	48
12	31	50
13	34	51
14	35	52
15	38	53
16	39	54
17	41	56
18	43	58
19	45	58
20	46	59
21	48	60
22	50	61
23	50	63
24	51	65
25	52	66
26	52	68
27	53	70
28	54	71+
29	54	71+
30	55	71+
31	55	71+
32	56	71+
33	57	71+
34	57	71+
35	58	71+
36-37	59	71+
38	60	71+
39-40	61	71+
41	62	71+
42-43	63	71+
44	64	71+
45	65	71+
46-47	66	71+
48	67	71+
49-50	68	71+
51	69	71+
52	70	71+
53+	71+	71+

TABLE 4

onversion Table: Near Vision NPV Raw Scores to Body Age Scores[99]

Near Vision NPV in inches	Men and Women: Body Age in years
0.0 - 3.9	19-
4.0 - 4.1	20
4.2	21
4.3	22
4.4 - 4.5	23
4.6 - 4.7	24
4.8	25
4.9 - 5.0	26
5.1	27
5.2 - 5.3	28
5.4	29
5.5 - 5.7	30
5.8 - 6.1	31
6.2 - 6.5	32
6.6 - 6.8	33
6.9 - 7.1	34
7.2 - 7.5	35
7.6 - 7.9	36
8.0 - 8.2	37
8.3 - 8.5	38
8.6 - 8.9	39
9.0 - 9.5	40
9.6 - 10.1	41
10.2 - 10.7	42
10.8 - 11.3	43
11.4 - 11.9	44
12.0 - 12.5	45
12.6 - 13.1	46
13.2 - 43.7	47
13.8 - 14.3	48
14.4 - 14.9	49
15.0 - 17.3	50
17.4 - 19.7	51
19.8 - 22.1	52
22.2 - 24.5	53
24.6 - 26.9	54
27.0 - 29.3	55
29.4 - 31.7	56
31.8 - 34.1	57
34.2 - 36.5	58
36.6 - 38.9	59
39.0 - 41.3	60
41.4 - 43.7	61
43.8 - 46.1	62
46.2 - 48.5	63
48.6 - 50.9	64
51.0 - 53.3	65
53.4 - 55.7	66
55.8 - 58.1	67
58.2 - 60.5	68
60.6 - 62.9	69
63.0 - 65.3	70
65.3 +	71+

TABLE 5

Conversion Table: Systolic Blood Pressure SBP Raw Scores to Body Age Scores

Systolic Blood Pressure SBP mm. Hg. %	Men: Body Age in years	Women: Body Age in years
0 - 110	19-	19-
111	19-	20
112	19-	21
113	19-	23
114	19-	25
115	19-	28
116	19-	30
117	19-	32
118	19-	33
119	19-	35
120	19-	36
121	20	37
122	21	39
123	24	40
124	27	41
125	30	42
126	32	43
127	35	44
128	38	45
129	40	46
130	42	46
131	44	47
132	46	48
133	48	49
134	50	50
135	51	52
136	52	53
137	53	55
138	54	56
139	55	58
140	56	59
141	57	59
142	58	61
143	59	61
144	60	62
145	63	62
146	65	63
147	67	63
148	69	64
149	71	64
150	72	65
151	73	65
152	74	66
153	76	66
154	77	67
155	78+	67
156-157	78+	68
158-159	78+	69
160	78+	70
161+	78+	71+

APPENDIX F

GENERAL HEALTH SCALE

Next, are twelve questions dealing with general health. I would like you to answer them now. Circle your answer.

1. Have you been sick at any time during the past 12 months?

   Yes
   No (If No then proceed to Q. 4.)

2. How serious an illness was it? Was it...

   ...very serious
   ...fairly serious
   ...not very serious

3. About how many days have you been bothered by illness during the last 12 months?

   Days_____

4. Do you have any long standing health trouble or physical disability?

   No (If No then proceed to Q. 7)
   Yes

5. What type of problem is it?

   Heart
   Cancer
   Arthritis
   Vision
   Stomach ulcers
   Other (Specify) a._____
   b._____

6. How serious a problem is this for you? Is it...

   ...very serious
   ...fairly serious
   ...not very serious

7. Next is a list of various health troubles and complaints people sometimes have. For each one would you indicate whether you have been bothered by it quite a lot, a little, or not at all during the past 12 months. Write the appropriate number beside the item.

1. Quite a lot. 2. A little. 3. Not at all.

a. Colds or flu_____
b. Headaches_____
c. Nervousness or tenseness_____
d. Aches and pains in muscles and joints_____
e. Feeling generally run down_____
f. Having difficulty sleeping_____

8. How would you describe your state of health, would you say it was...

...excellent
...very good
...good
...fair, or
...poor?

9. Now what about your physical fitness, that is, the amount of energy you have and your endurance. Would you describe it as...

...excellent
...very good
...good
...fair, or
...poor?

10. In general, how satisfied or dissatisfied are you with your health and physical condition?

    1. Very dissatisfied
    2. Dissatisfied
    3. Neutral
    4. Satisfied
    5. Very satisfied

11. In general, how satisfied or dissatisfied are you with the health care and medical services available to you and your family?

    1. Very dissatisfied
    2. Dissatisfied
    3. Neutral
    4. Satisfied
    5. Very satisfied

12. How many times have you visited your Doctor in the last 12 months? _____

13. How many times have you been hospitalized without having surgery, in the last 12 months? _____

14. How many times have you been hospitalized for surgery in the last 12 months? _____

15. Are you currently taking any proscribed medication?

    Yes
    No

16. Has there been any change in your health over the past 12 months?

Yes

No

If Yes, please briefly describe how your health has changed. _____

_____

_____

_____

_____

_____

APPENDIX G

LEISURE ACTIVITY SCALE

In the next section I want to know how people usually spend their leisure time. Here is a list of activities. On the left side of the page put a circle around the number that tells how often you do these things now, using the key at the top of the column. On the right side of the page put a circle around the number that tells how well you like these things, using the key at the top of the column. If you never do the activity mentioned, circle number one (1) in the left column to indicate no participation, and cirlce no number on the right side of the page. Try not to skip any item.

How Often Do You Do These Things

1. Never
2. Rarely
3. Occasionally
4. Fairly often
5. Frequently

TIGHT BINDING
Reliure trop rigide

How Well Do You Like These Things

1. Dislike very much
2. Dislike
3. Indifferent
4. Like
5. Like very much

3 4 5	1. Amatuer dramatics	1 2 3 4 5
3 4 5	2. Amusement parks and halls	1 2 3 4 5
3 4 5	3. Art work (individual)	1 2 3 4 5
3 4 5	4. Attending large social functions (dances, benefit bridge, etc.)	1 2 3 4 5
3 4 5	5. Attending small social entertainments (dinner parties, etc.)	1 2 3 4 5
3 4 5	6. Book reading for pleasure	1 2 3 4 5
3 4 5	7. Conventions	1 2 3 4 5
3 4 5	8. Conversation with family	1 2 3 4 5
3 4 5	9. Card playing	1 2 3 4 5
3 4 5	10. Church and related organizations	1 2 3 4 5
3 4 5	11. Dancing	1 2 3 4 5
3 4 5	12. Dates	1 2 3 4 5
3 4 5	13. Entertaining at home	1 2 3 4 5
3 4 5	14. Fairs, exhibitions etc.	1 2 3 4 5
3 4 5	15. Informal contacts with friends	1 2 3 4 5
3 4 5	16. Informal discussions, e.g., "bull sessions"	1 2 3 4 5
3 4 5	17. Indoor team recreation or sports-basketball, volleyball	1 2 3 4 5
3 4 5	18. Indoor individual recreation or sports-bowling, gym, pool, billiards, handball	1 2 3 4 5
3 4 5	19. Knitting, sewing, crocheting, etc.	1 2 3 4 5
3 4 5	20. Lectures (not class)	1 2 3 4 5
3 4 5	21. Listening to radio or TV	1 2 3 4 5
3 4 5	22. Literary writing-poetry, essays, stories, etc.	1 2 3 4 5
3 4 5	23. Magazine reading (for pleasure)	1 2 3 4 5
3 4 5	24. Movies	1 2 3 4 5
3 4 5	25. Newspaper reading	1 2 3 4 5
3 4 5	26. Odd jobs at home	1 2 3 4 5
3 4 5	27. Organizations or club meetings as a member	1 2 3 4 5

2 3 4 5	28. Organizations or club meetings as a leader (as for younger groups)	1 2 3 4 5
2 3 4 5	29. Outdoor individual sports-golf, riding, skating, hiking, tennis	1 2 3 4 5
2 3 4 5	30. Outdoor team sports-hockey, baseball, etc.	1 2 3 4 5
2 3 4 5	31. Picnics	1 2 3 4 5
2 3 4 5	32. Playing musical instruments or singing	1 2 3 4 5
2 3 4 5	33. Shopping	1 2 3 4 5
2 3 4 5	34. Sitting and thinking	1 2 3 4 5
2 3 4 5	35. Spectator of sports	1 2 3 4 5
2 3 4 5	36. Symphony or concerts	1 2 3 4 5
2 3 4 5	37. Telephone visiting	1 2 3 4 5
2 3 4 5	38. Theater attendance	1 2 3 4 5
2 3 4 5	39. Traveling or touring	1 2 3 4 5
2 3 4 5	40. Using public library	1 2 3 4 5
2 3 4 5	41. Visiting museums, art galleries, etc.	1 2 3 4 5
2 3 4 5	42. Volunteer work-social service, etc.	1 2 3 4 5
2 3 4 5	43. Writing personal letters	1 2 3 4 5
2 3 4 5	44. Special hobbies-stamps, photography, shop work, gardening, and others not included above	1 2 3 4 5
2 3 4 5	45. Fishing or hunting	1 2 3 4 5
2 3 4 5	46. Camping	1 2 3 4 5
2 3 4 5	47. Developing and printing pictures	1 2 3 4 5

Has there been any change in your activity level over the past 12 months?

Yes

No

If 'Yes', would you briefly describe the change(s).

_____

_____

_____

_____

_____

_____

APPENDIX H

SOCIAL NETWORK SCALE

The next section of the questionnaire deals with your social network, that is the people with whom you have contact on a regular bases, either in person, by telephone or by mail.

I would like you now to write down the first names of the people with whom you have regular contact in the spaces provided on the following pages. Put one name in each space in the left hand column. You do not have to fill all the spaces.

After you have written in the names I would like you to answer the following four questions for each name you have written down.

1. In the column marked "Type of relationship" write in the number of the appropriate answer from the following four possibilities:
   1. Family member (wife, child, brother, etc.)
   2. Nonfamily member (uncle, nephew, etc.)
   3. Friend
   4. Social and Health services providers (Doctors, nurse, social worker)

2. In the column marked "Frequency of contact" indicate how often you have seen them in the past 12 months:
   1. Once a year
   2. Three times a year or twice a year
   3. Every two months or four times a year
   4. Every two weeks or once a month
   5. Daily or weekly

3. In the column marked "Importance of the relationship" indicate how important the relationship is to you:
   1. Very unimportant
   2. Unimportant
   3. Neutral
   4. Important
   5. Very important

4. In the column marked "Satisfaction with the relationship" indicate how satisfied you are with the relationship you have with that person:

    1. Very unsatisfied
    2. Unsatisfied
    3. Neutral
    4. Satisfied
    5. Very satisfied

First Name	Type of Relationship 1. Family member 2. Nonfamily member 3. Friend 4. Social and Health services providers	Frequency of Contact 1. Once a year 2. 3 times a year or 2 times a year 3. Every 2 months or 4 times a year 4. Every 2 weeks or once a month 5. Daily or weekly	Importance of the Relationship 1. Very unimportant 2. Unimportant 3. Neutral 4. Important 5. Very important	Satisfaction of the Relationship 1. Very unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied

First Name	Type of Relationship 1. Family member 2. Nonfamily member 3. Friend 4. Social and Health services providers	Frequency of Contact 1. Once a year 2. 3 times a year or 2 times a year 3. Every 2 months or 4 times a year 4. Every 2 weeks or once a month 5. Daily or weekly	Importance of the Relationship 1. Very unimportant 2. Unimportant 3. Neutral 4. Important 5. Very important	Satisfaction of the Relationship 1. Very unsatisfied 2. Unsatisfied 3. Neutral 4. Satisfied 5. Very satisfied

Has there been any change in your social network over the past 12 months?

Yes

No

If "Yes", would you briefly describe the change.

_____

_____

_____

_____

_____

_____

APPENDIX I

LIFE EVENTS SCALE

The final section of the questionnaire contains a list of 61 events which may occur in a person's life. I would like you to go through the list and write, in the column on the right marked "Number of times it occurred", the number of times each event has occurred in your life in the last 12 months. If you have not experienced the event in the last 12 months place a zero (0) in the space next to it.

Event	Number of Times it Occurred
1. Death of close family member (parent,sibling)	
2. Business failure	
3. Major personal physical illness (hospitalization or one month of work)	
4. Fired	
5. Increased arguments with fiance or steady date	
6. Major financial difficulties (very heavy debts, bankruptcy)	
7. Death of spouse	
8. Court appearance for serious legal violation	
9. Unemployed for one month	
10. Miscarriage or stillbirth	
11. Move to another country	
12. Change in schools	
13. Death of child	
14. Death of close friend	
15. Divorce	
16. Break engagement	

Event	Number of Times it Occurred
17. Take a large loan (more than one half of a year's earnings)	
18. Loss of personally valuable object	
19. Minor personal physical illness (one that requires physician's attention)	
20. Jail sentence	
21. Marital reconciliation (after one partner left home)	
22. Separation from significant person (close friend or relative)	
23. Retirement	
24. Hospitalization of family member (serious illness)	
25. Arguments with boss or co-worker	
26. Take important exam	
27. Change in line of work	
28. Spouse unfaithful	
29. Law suit	
30. Birth of a child (father) or adoption	

Event	Number of Times it Occurred
31. Minor legal violation	
32. Increased arguments with spouse	
33. Unwanted pregnency	
34. Son drafted	
35. Marital separation due to argument	
36. Cease steady dating (of at least three months)	
37. Child becomes engaged	
38. Menopause	
39. Demotion	
40. Increased arguments with resident family member	
41. Moderate financial difficulties (bothersome but not serious, i.e. increased expenses, trouble from bill collectors)	
42. Change in work hours (much overtime, second job, much less than usual)	
43. Wife becomes pregnant	
44. Become engaged	
45. Move in same city	
46. Change in work conditions (new department, new boss, big reorganization)	

Event	Number of Times it Occurred
47. Promotion	
48. Child married against respondents wishes	
49. New person in household	
50. Begin extramarital affair	
51. Marital separation not due to argument	
52. Cease full-time education (graduate or dropout	
53. Argument with nonresident family member (in-laws, relatives)	
54. Academic failure (important examine or course)	
55. Birth of live child	
56. Begin education	
57. Move to another city	
58. Child leaves home (e.g. college)	
59. Marriage	
60. Wanted pregnancy	
61. Child married with respondent's approval	

APPENDIX J

DEMOGRAPHIC INFORMATION FORM

The first section of the questionnaire deals with basic background information. Please answer the following questions:

Age:_____

Religion:_____

Education:_____

Marital Status: Married_____ Single_____
Separated_____ Widowed_____
Divorced_____

Residence: Private House_____
Semidetached_____
Apartment_____

Current Occupation_____

Present Annual Income_____

How long were you in the military? years_____ and months_____

Military rank at time of retirement._____

Military trade at time of retirement._____

_____

Annual income at time of retirement from the military._____

_____

Date of retirement (month/year)._____

Number of postings outside of Canada while in the military._____

APPENDIX K

MEDICAL RELEASE FORM

I give the researcher permission to send my systolic blood pressure score to my physician for his/her's consideration if the average of the three readings indicates the possibility of hypertension.

_____

Participants signature

_____

Date

Physician's name: _____

Adress: _____

_____

_____

APPENDIX L

CODING BOOK FOR QUESTIONNAIRE

Demographic Form

Question

1. Age — Treat as raw data.

2. Religion
   1. Protestant
   2. Roman Catholic
   3. Jewish
   4. United
   5. Presbyterian
   6. Anglican
   7. Baptist
   8. Other
   9. Blank

3. Education
   1. Elementary
   2. Secondary
   3. Secondary 12-13
   4. College
   5. University
   9. Blank

4. Marital Status
   1. Married
   2. Separated
   3. Divorced
   4. Single
   5. Widowed
   9. Blank

5. Residence
   1. Private House
   2. Semidetached
   3. Apartment

6. Current Occupation — 9 if blank.
   1. Technical/Trade -Post office -Bartender -Store man -Technical -Public utilities Inspector -Security guard -Delivery -Fleet Supervisor -Driver
   2. Profession -Insurance Adjustor -Landlord -Quality Assurance -Civil -Photographer Servant -Auditor
   3. Clerical -Office manager -Shipping clerk
   4. Unemployed
   5. Retired

7. Present Annual Income
8. Length of Military Service — All coded as raw data.
11. Military income
12. Date of retirement
13. Number of postings outside Canada — Use 9 if blank.

9. Military Rank
   1. Corporal
   2. Master Corporal

3. Warrant Officer
4. Chief Warrant Officer
5. Master Warrant Officer
6. Sargent

10. Military Trade

1. Technical/Trade	- Airforce tech. - Trade vehicle tech. - Areo engine tech. - Air traffic Controler - Photographer - Medic - Military Police
2. Combat Arms	- Infrantry - Artilery
3. Clerical	- Supply tech. - Finance clerk - Admininstration clerk - Stores - Logistics Warehousing

Leisure Activity Scale

Leisure Activity Frequency- Sum the circled numbers

Leisure Activity Enjoyment- Sum the circled numbers

Change in Activity
Yes = 2
No = 1
Blank = 0

General Health Scale

For all Questions: Use 0's if blank, 9's if N/A

Questions 1 and 4 Yes = 2, No = 1

Questions 2 and 6
very serious = 3
fairly serious = 2
not very serious = 1

Questions 7 a-f
- quite alot = 3
- a little = 2
- not at all = 1

Questions 8 and 9
- excellent =1
- very good =2
- good =3
- fair =4
- poor =5

Questions 10 and 11
- very dissatisfied =5
- dissatisfied =4
- neutral =3
- satisfied =2
- very satisfied =1

Sum the scores of questions 1,2,4,6,7,8,9,10,11 for the General Health score.

Question 3 (number of days ill), 12 (visits to doctor), 13 and 14 (hospitalization with and without surgery) are coded as raw data.

Question 15 Prescribed Medication
- Yes = 2
- No = 1

Question 16 Change in Health
- Yes = 2
- No = 1

Question 5 Type of illness

1. Heart
2. Cancer
3. Arthritis
4. Vision
5. Stomach Ulcers
6. Allergy
7. Asthma
8. Back Problem
9. Hearing
10. Knee Problem

Social Network Scale

Total social network - Sum the number of names listed.

Frequency of Family contact
Frequency of Nonfamily contact
Frequency of Friend contact
Frequency of Social Service

Sum the rating of each of the four types for relationships and divide

and Health Providers	by the number of that type.
Importance of Family Importance of Nonfamily Importance of Friends Importance of Social Service and Health Providers	Same as above.
Satisfaction of Family Satisfaction of Nonfamily Satisfaction of Friends Satisfaction of Social Service and Health Providers	Same as above.
Change in Social Network	Yes = 2, No = 1, 0 = Blank

Life events scale

Sum the number of times the events have occurred.