FATIGUE IN THE AGED

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Abstract

Levels of fatigue and mood dimensions were measured pre and post retirement. On the basis of a conflict analysis of fatigue originating from the conceptual framework established by Bartley and Chute (1969), it was hypothesized that fatigue levels would be higher pre than post retirement. The nature of the conflict involves negative attributions to retirement itself and to retirement as the advent of old age. Numerous studies support the widespread prevalence of such perceptions. Moreover, these perceptions seem to rest upon deeply rooted cultural definitions of old age and retirement practices operating in cultures based on Northern European models. The hypothesis was confirmed with a small sample of workers studied during a one-year period divided by point of retirement. More specifically, it was found that the two months prior to retirement were periods when fatigue levels were significantly higher in the early evening as compared to fatigue in early evenings two months immediately after retirement. In general, the picture is one of increasing fatigue peaking immediately pre retirement, followed by elevated mood immediately post retirement, gradually decreasing to normal pre retirement levels.

Résumé

Les niveaux de fatigue et les dimensions d'humeurs furent mesurés avant et après la retraite. A base d'une analyse de conflit de la fatigue, analyse qui provient d'un schème de références conceptuelle établi par Bartley et Chute (1969), nous présentons l'hypothèse que la fatigue devrait être plus élevée avant qu'après la retraite. La nature du conflit implique des attributions négatives à la retraite elle-même et à la retraite perçue comme l'arriveé de la vieillesse. Un bon nombre d'études appuient l'acceptation générale des perceptions de ce genre. En plus, ces perceptions semblent s'appuyer sur des définitions de la vieillesse, définitions profondément enracinées dans la culture et dans les pratiques de retraite on opération dans les cultures qui se basent sur les modèels nord-européens. L'hypothèse fut confirmée par l'étude d'un petit échantillon de travaillants, ce groupe ayant été étudié une année, à savoir l'année qui marqua la prise actuelle de la retraite. Plus spécifiquement, nous avons remarqué que pendant les deux mois qui précèdent immédiatement la retraite, le niveau de fatigue ressentie tôt dans la soirée était, de façon significative, plus élevé que le niveau de fatigue ressentie à la même heure deux mois après la retraite. En général, il s'agit dont d'un niveau de fatigue dont la croissance atteint son apogée immédiatement avant la retraite. Ce niveau de fatigue est suivi d'un état d'âme très intense, celui-ci se produisant immédiatement après la retraite. Cet état d'âme cependant disparaît peu de façon à ce que le niveau normal qui existait avant la retraite soit rétabli.

Bengston (1973) says that the main obstacle hindering the development of social gerontology is "the lack of an adequately large and scientifically sound body of facts concerning social and psychological processing in aging." The present study is a modest start in the direction of measuring the affective significance of retirement. We were interested in measuring change within a small sample of retiring persons in the months immediately before and after retirement. Specifically, perception of fatigue and of mood were measured and these related to time of retirement.

Both mood and fatigue are personal phenomena which fluctuate in intensity and for which there are psychological scales of measurement. Even though hard and fast lines cannot be drawn between these two states and emotion, in general mood and fatigue may be taken to reflect relatively slower and more pervasive personal adjustments to situations, while emotion is most closely linked to sudden shifts in conditions which elicit fairly specific kinds of biological response (Wessman & Ricks, 1966). Of the two states of concern, fatigue has proven to pose particularly difficult problems conceptually (Bartley & Chute, 1969). The difficulty partially arises because of a long history of parallel uses in experimental fields adjacent to those of psychology and partially because of

1. Data was collected in Edmonton, Alberta, under a grant awarded by Alberta Mental Health Advisory Council. The author is attached to the Department of Psychology, University of Alberta.

conflicting ideas within psychology itself.

Bartley and Chute (1969) have pointed out that the term has taken on three meanings when applied to the human. First, it may refer to measurable or observable decline in overt performance, almost always manifested as a drop in the quality or quantity of work. Second, the term is also used to denote temporary physiological changes, with the decreased responsiveness usually presumed to be caused by bio-chemical impairment of some portion of the neuro-muscular system. Third, fatigue is an item in the vocabulary of personal experience. If the word is used when a person is talking about his or her own experience, it is as a perception of decreased readiness to continue a particular activity (Nelson & Peta, 1978). Although the three uses are clearly *not* reducible one to the other as dependant variables (Bartley & Chute, 1969), they are perceptually related. Self perception of fatigue (decreased readiness to continue some particular activity) habitually utilizes impressions or knowledge about overt performance and local neuro-muscular distress, although it also relies heavily upon past experience related to the situation, i.e., fatigue may also be a learned response. Because self perception is the most generic of the three meanings Bartley and Chute (1969) have made the sensible suggestion that overt performance and impairment are explanatory of fatigue only when they enter the individual's experience in some way. If they do not form perceptions of fatigue they may be regarded as free standing concepts of interest and value to those studying work efficiency, reversible neuromuscular process etc. We will follow the recommendations of Bartley and Chute (1969) and Nelson and Peta (1978) from this point.

According to Bartley and Chute, fatigue commonly becomes a focal experience when a person is motivated either to enter into or continue an activity which the person perceives as being beyond his or her immediate capability. They imply that a negative balance between what one feels required to do and what one perceives as actually being able to do leads to *conflicting motivations* which the individual labels 'fatigue'. Therefore if fatigue in a real sense is a consequence of anticipated failure, it follows that fatigue will increase in situations in which complex motivations must be resolved. In accord with this, Bartley and Chute specifically suggest that when adaptation requires response to a large number of poorly understood positive and negative issues, the conflict tends to persist.

Fatigue may be pertinent to the issue of retirement because it is a complex transition involving many aversive elements. For example, retirement is erroneously assumed to be a factor in early death (Shanas, 1970). Also retirement is associated in the popular mind with the possibilities of loss of income, poor health, reduction of friends, and the need to search for meaningful activities. On the opposition side of the balance are possibilities for increased freedom, reduced responsibility, new interests, and travel. (Third Career Research Society, 1976). If this description is accurate, the pre-retirement condition would seem to dispose the person to conflict and therefore to increased fatigue. However for completeness sake, it should be acknowledged also that retirement will not pose a conflict for some persons. In a few cases, almost all of the contingencies associated with the new condition may appear positive and in a few cases negative.

The severity of conflict over retirement is of course, not only due to pressures of conflicting motivations but is also tied to the *intensity of the conflict* to be resolved. Here we can recall Ernest Hemingway, who is claimed to have loathed the prospect of retirement so much that he killed himself when the end of his career as a writer approached.

One of the more strongly aversive conditions of retirement is the inevitable consequence that one will be perceived as aged. Retirement is seen to usher in old age, which in turn is expected to be accompanied by reduced financial competence, downward adjustments of the standard of living, and introduce one to loss of meaningful work activity, repetitive health problems and the possibility of bereavement, and to force recognition of the inevitability of one's own death (Streib & Schneider, 1971). Thus, notwithstanding the presence of some positive connotations of old age (Ivester & King, 1977; Thorson, Whatley & Hancock, 1979; Seltzer & Atchley, 1971), North American attitudes toward aging are strongly in the negative direction (Weinberger & Millham, 1975; Naus, 1973; Weston, 1971; Atchley, 1971; Calhoun & Gottesman, 1969).

Now we would like to pass on to historical antecedents which suggest reasons why persons of North European origin regard retirement and aging as symbolic of lowered worth. Before turning to representing North European cultural attitude, we should recognize that societies have differed considerably in their treatment of the aged. In China, ancestor worship placed the headship of the traditional family in the hands of the eldest male in the eldest generation. As a variant of this, in Japan and Korea, headship traditionally went to the legitimate eldest son (Choi, 1970). Age entitled this person to considerable power in all three cases. His authorative right included responsibility for conduct of ancestor worship, marriages and funerals. He held title to all family property and

could dispose of it as well as the earnings and savings of all family members. He also arranged the marriages of his children and signed the contracts.

But this is of course, not by any means the general picture. Numerous pieces of ethnological data collected by Simmons (1970) shows the opposite picture for less completely evolved societies. Primitive peoples seem to accept aging as long as the person remains clearminded and self-sufficient. However, with decline they suffer progressive neglect. In extreme cases they may either be forced out of the family, abandoned, or killed outright. The habits of the Eskimos are perhaps amongst the best known and may serve as a model of extreme rejection of the aged.

North American society has been greatly influenced by Northern Europe which has used at least one model to define aging and another to define retirement. Since the meaning of these two items overlap considerably in the everyday world, the significance of both is worth looking into. I would like to call this concept of aging the *damage* model because it is based upon the idea of providing recompense for loss of value. This model, which is also an attitude toward human life, was worked out in detail by assuming that (a) every life has value,[2] (b) life value is one in a defined range of values, (c) the range of values and hence the value of any individual human life is to be defined as a monetary value within the range on the basis of (measurement of) chronological age. Thus it is that from the Eastgoths, Westgoths, and Northern peoples who controlled almost all of Europe toward the end of the Roman Empire, that we inherit the idea that 'everything has its price' and also the operational expression of the idea in the form of price schedules, the so-called 'scales of blood-money'. These scales of blood-money fixed the standard compensation offered the injured for killed family members as the alternative to the injured family taking revenge upon the offender. Although the amounts vary somewhat from people to people and from time to time, the Westgoth system in use by the Burgundians during the 6th Century (de Beauvoir, 1972) is a typical evalution:

> Sixty gold sous for a child from the age of one
> A hundred and fifty for a boy from fifteen to twenty
> Three hundred for a man from twenty to fifty
> Two hundred for a man from fifty to sixty-five
> One hundred for a man over sixty-five.

Note that the final age break falls at 65; after 65 a man is worth somewhat less than a boy of 15 and one-third as much as a man aged 20 to fifty. Notice also that there is a sharp decline at 50 years for males. Actually, even today the 40-year period is popularly considered to provide the last opportunity for a man to change occupations, or expect to receive a major promotion in highly competitive places in the business world.

The firmness of the 65- and 50-year age breaks is reflected in the European retirement statistics. Burgess (1960) was led to choose age 65 as his criterion for the onset of old age on the basis of the fact that twelve of eighteen non-Communist European countries he studied settled on 65 years as the pensionable age for men.

The corresponding specification for women is as follows:

> Two hundred and fifty for a woman from fifteen to forty
> Two hundred for a woman from forty to sixty.

Again it is interesting to note that Burgess (1960) reports that the most frequently selected pensionable age for *women* workers in the same countries is 60 years, corresponding with the limit of the upper interval of the Westgoth scale in use 1300 years ago.

I therefore propose that it is likely that it is the concept of awarding for damage that lies behind fixing the point for obligatory retirement of normally healthy workers at 65 years of age, and also provides for the type of thinking which reduces the question of aging to a schedule of monetary benefits post retirment.

The retirement model is much different, being based upon competitive competence. It is based upon competition which recognizes the relevance of psycho-biological as contrasted to chronological age. The model is concerned with competence relative to specific work, continuing rights of tenure, and the types of benefit to accrue to the individual from retirement. This model, which I shall call the Odel model, in honour of its possible origin, is as old as the damage model.

Odel rights have been an important factor contributing to the social stability of Scandinavia. Erik Groenseth (1970) studied the development of the nuclear family in Norway from mediaeval (Viking) to modern times, paying great attention to family roles in the Odel system of land tenures; a system which extends into the present day in Norway. Under the Odel system the entire farm land is given over to the eldest son. The eldest son receives "Odels" and if the other male children stay on, it is as labourers in the employ of their older brother. Superficially, the system appears to be like the Chinese, with the eldest son in the driver's seat. This is really not so, because veneration of age is not linked to land inheritance.

2. Odin speaking in the HAVAMAAL (Wisdom of the High One) says "the halt may ride a horse: the handless drive a herd, the deaf may fight and do well: better be blind than buried. A corpse is good for nought." (verse 37, pg 7, Vigfusson, 1965). This attitude is considerably different from the primitive utilitarian, but at the same time, clearly pre-Christian.

In fact, while the actual assumption of Odels depends upon the death of the father, a practical transfer of rights of property to the oldest son is actually made on quite a different basis, one related to conflict resolution between generations within the family. Nominally, so long as the father remains strong and competent he continues to stay in command. However, Groenseth notes that when the eldest son reaches 40, and surely by 50 years of age, conflicts with the eldest son gradually reach a level where a new relationship is formed. This is made as a contract in which the son specifies the types of material support he will provide and the rights which the father retains. At this point the father may retire with his household to smaller but usually self-contained quarters. In Scandinavia this 'competence test' has the effect of setting 50 years as the limit of youth and fixing retirement for the father in Norway when the first child is born. While this model is not specific with respect to age of retirement, it withdraws prerogatives from eldest members and defines old age as retirement and a period of dependence. More specifically, old age and retirement are the time at which Odels literally slip through your hands.

I have introduced these materials to show two things; one is that many models relating age to retirement have been used in the world; two is that the contemporary definition of old age on the basis of years has deep cultural roots in western societies. After reflecting on the matter, it seems to me that legislation basing retirement on age 65 merely corroborates a longstanding negative conception of old age and links this to retirement. It might be thought that the relationships described have in some ways died; they have not. First of all, Odel rights persist. Secondly, we find the damage definition operating in only slightly altered form as modern court orders providing payment for accidental death (Kemp & Kemp, 1975). Such judgments are the modern counterpart of awards of 'blood-money' by arbitrators in North European folk societies, murder having been separated from accidental death in the Christian era.

A suggestion of the nature of the system of valuation used at the present time therefore can be based upon insurance awards for causing accidental loss of life, and is presented in Figure 1. Comparing this to the Westgoth system, we find that in modern as well as historical societies of Western Europe, a man is valued on the basis of age. Of course in modern western society we also assume a man has a certain value beyond this, because we reason that he is a human life and all human life is sacred.

The line representing contemporary Canadian value is based upon damages awarded by Canadian courts to a wife of a man killed accidentally in a automobile accident. Notice that

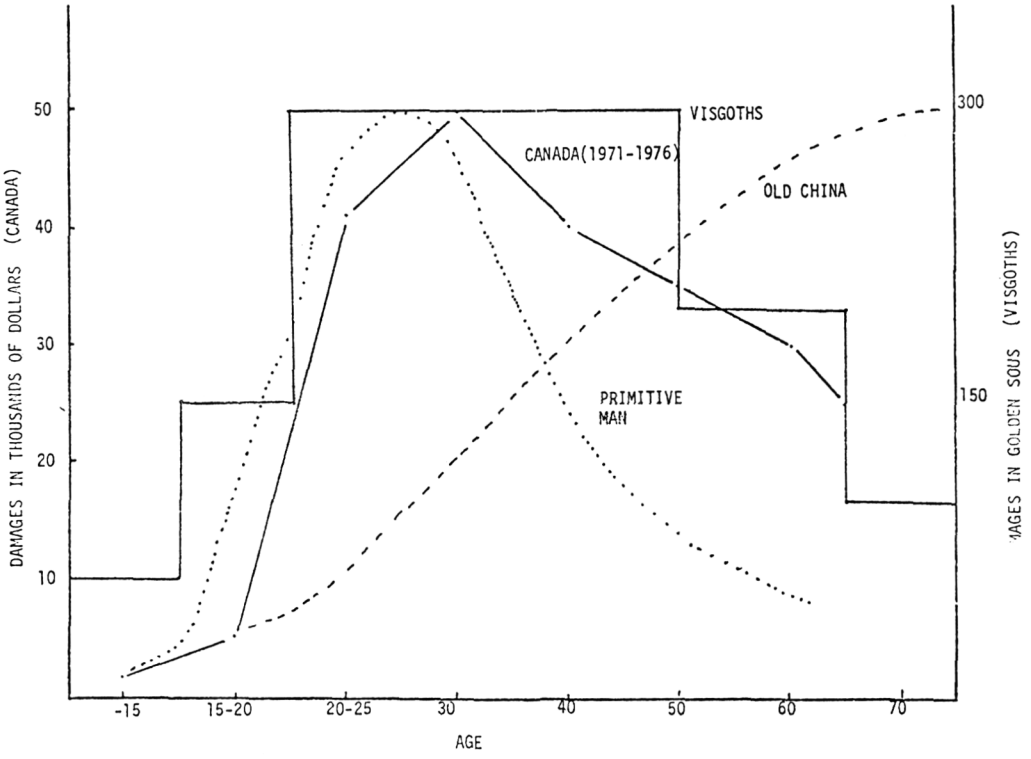


Figure 1. Damages paid to family after death of an individual male. (Prepared from data provided by Kemp and Kemp, 1975)

the average value shows very little difference from the categorical values placed on life 1300 years ago. The relative amounts paid are not greatly different from those paid to widows and their children under the Westgoth system; a family man of age 56 to 65 being worth half of the value paid for the average person in the 26 to 35 year age range. Parenthetically, it is interesting to note that data not represented in Figure 1 show that women have become greatly devaluated as compared to Westgoth scales. The average awards of damages to a husband for accidental death of his wife range from 70% down to 10% of the damages which are paid for the accidental death of a husband. At no time are women worth more than men, unlike the case in mediaeval Northern Europe.

It does not seem too remote a possibility on such evidence to suggest that both society and individuals themselves still give considerable weight to age and retirement in judging the individual's value to society. It might even seem 'normal' for a person approaching retirement to perceive his own sense of self-worth to be in jeopardy. We would like to propose that these negative social characterizations of old age are represented by the widespread fears that there will be loss of status, poor health, lowered independence and income, lack of meaningful activities and social relations after retirement. It is also natural that such anticipations should lay the foundations for fatigue. We do not wish, of course, to imply that all retiring persons will perceive such problems, but significant numbers may do so and experience intense conflict as retirement nears.

In addition to culturally ordained expectations, there are also important problems which have arisen in relation to changing conditions of the aged in society. These are part of the nagging uncertainties preceding retirement, since they cannot be identified precisely. In point, Fuller (1976) reports that economic rank and number of years retired do not affect retirement adjustment, but that pre-retirement planning does. Evidence offered by Peppers (1976) is consistent with this. In addition, most retirees are aware that the conception of old age is embedded in a much different social context than they learned in younger years. This may offer hope to some and threaten others, but in almost all cases it reinforces the idea that they are out of touch with social trends consistent with the implications of society. Finally, trends in Western culture are unabately toward further industrial expansion, continuing progress in science and technology, and therapeutic interventions necessary for prolongation of life. These may add to the problems of conflict resolution in persons preparing to adapt to retirement. The security which the aging person formerly had was within the family, but it is now lodged in a rather cold substitute, the state. Indeed, Neugarten (1976) concludes that a most important variable in the adaptation to aging is the way in which the person changes in daily rhythms of living.

On the side of positive social change affecting the retiree, one might include the continuing growth of participatory democracy in many countries with the correlate promise of more adequate social planning for the retired, and the rise of social gerontology with concomitant research projects directed toward amassing accurate knowledge of the human effects of retirement and aging. We cannot know how these many issues are interwoven by individuals facing or experiencing retirement but we can reasonably expect that they will have some negative consequences in so far as they provide conflicting anticipations for the future, of varying intensity.

Our study of mood and fatigue in relation to retirement began when we approached several corporations such as A.G.T., who subsequently put us in contact with persons who had just started in their last year of employment. All subjects were retiring at the mandatory age and were in good health. The sample was made up of both males and females with five or more years service. From this group we solicited volunteers who were willing to serve in a long-term study concerned with the subjective aspects of retirement. At the same time as we were arranging for our subject samples, interviewees were being trained who were assigned a number of persons to interview. The actual interviews were ultimately to be done in the homes during the evening hours at the same time every week. Time of interview was important since fatigue measures were to be taken. Unfortunately it turned out that several interviewees were subsequently unable to complete their assignments satisfactorily, leading to a loss of part of the original sample. Also a number of subjects dropped out of the study for various reasons, so that finally we had some continuous data from 13 subjects for analysis.

Each participant completed extensive questionnaires during the interview. The questionnaires included the *Nowlis MACL* (Mood-adjective check list), (Nowlis, 1965), the *Pearson-Byars Feeling-Tone Check-List,* (Pearson & Byars, 1957), a *Restriction Questionnaire* and a *Health Questionnaire.* In addition, participants also reported on how they had allocated the hours of the week — in activities at home and away.

The *Nowlis-Green* consists of a series of adjectives which the individual rates as to their applicability for describing his or her mood at that particular time. Each adjective is rated on a four-point scale. From the ratings for similar adjectives it is possible to compute scores for a

number of scales. Since we were concerned with changes in general mood tone, we further combined these scales to provide measures for general affect, general arousal, and mental stability. The form of the Nowlis-Green used here was modified by Meldges, et al. This modification consisted in the addition of two scales which may be described as state (mood now) and trait (general mood) mental stability.

The fatigue measure was the *Pearson-Byars* which consists of a series of statements describing how tired, alert, energetic, etc., an individual is. When taking this test the person is required to rate the applicability of each statement to his/her subjective assessment. His/her final score is then determined by summing the product of the participants rating the weights of each statement. The Pearson-Byars index ranges from a value of −180 to a value of +180.

A *perceptual restriction* questionnaire consists of a number of statements which refer to the participant's personal state. Each participant was required to indicate whether the statement was never, rarely, occasionally, many times, or always true. These were then scored 0, 1, 2, 3, 4. The perceptual restriction questionnaire was developed through the classification of effects noted in Schulz' (1965) review of the perceptual motor, cognitive, learning, and affective changes symptomatic of perceptual restriction. Perceptual restriction may be said to occur when attention is restricted to repetitive stimulation and a lack of variety in the environment.

The *activity allotment* questionnaire was a daily calendar requiring participants to report how activities were distributed during the day. For purposes of a statistical test, data from eight people completing the most interviews within the two months preceding and two months following the week of retirement were analyzed. Specifically, measures from each participant during each of the four months (actually four week periods) were averaged to obtain the individual scores. All analyses were then done with two months before and after retirement as the main independent variable.

Table 1 shows the mean scale scores for affect, arousal, and mental stability from the Nowlis-Green MACL. Note that the level of general affect shows little change over the months before and after retirement. Similarly, little change in level of mental stability is reported, although most participants said that during the second month preceding retirement they experienced greater mental stability.

Rated arousal however, did change as a function of time before and after retirement. Most participants reported themselves as being more fatigued and less vigorous before retirement. This

TABLE 1
Mood Changes as a Function of Retirement. (Prepared from data provided by Kemp and Kemp, 1975)

	Weeks from retirement			
	-2	-1	+1	+2
Nowlis-Green				
Concentration	3.31	1.74	1.58	1.61
Affect	11.07	9.77	10.94	11.03
Fatigue	1.87	1.11	2.3	3.00
Pearson Byars	-1.49	-14.94	+6.37	+22.49
Restriction	34.6	34.2	33.3	30.82

affect is reliable ($\chi^2 = 10.5$). These Pearson-Byars scores, based upon the medium of our sample, are also shown in Table 1. As with the arousal measure of the Nowlis-Green, the Pearson-Byars also shows the greatest fatigue to be during the month immediately preceeding retirement. Concerning these measures it should be pointed out that the Pearson-Byars fatigue check list is constructed so that scores may range from −180 to +180 with 0 being a point of subjective neutrality. It was standardized upon military personnel however, and the norms are not applicable to our sample. Therefore the medium fatigue responses given by our participants have been employed. Notice that the point deviations from the medium differ very little from the neutral position except possibly post-retirement, where the values are comparatively high.

In the perceptual restriction questionnaire most items were scored as "rarely" or "never" true. The mean scores for this questionnaire are also given in Table 1. These differences are not significant. The failure to find any difference here is consistent with the findings of little difference in affect or mental stability as a function of retirement. This is not always the case. In other research with repetitive, paced work we have found higher levels of perceptual restriction and these were reliably correlated with fatigue. The fact that the fatigue condition is not related to boredom here as in the case of paced work may have to do either with the situation or the fatigue level. The fatigue measures from the present sample before retirement were taken outside of the workday (in the evening) and perhaps did not reflect the origin of the fatigue state. Fatigue is characteristically cumulative; thus, even though fatigue may be thought of as a form of retreat or escape from an aversive situation, according to Bartley and Chute (1969), fatigue levels at a given moment need not reflect demands in the immediate situation.

Figure 2 shows the mean number of hours the subjects reported spending at home and away from home. As one would expect, after retirement participants report spending more time at home and less time away from home. During the second month following retirement, on the average they

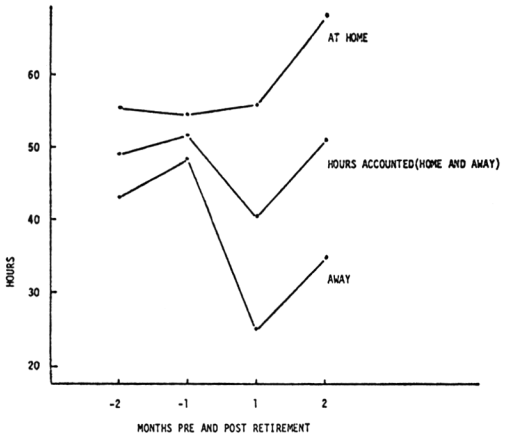


Figure 2. Allocation of time at home and away as a function of retirement

report an increase of about fifteen hours spent at home, and a decrease of about fifteen hours spent away from home. During the first month following retirement, subjects report spending about the same amount of time at home as before retirement, but they also report spending less time away from home. Thus in total, less hours are accounted for during the four weeks immediately following retirement. Since subjects were required to fill out the time allocations in one setting, they probably relied to some considerable extent upon their knowledge of what they normally did with their time. During the month following retirement they may not have completely established their normal routine, so that they had to place more reliance upon the memory of the specific events of the previous week. The period immediately post retirement is similar in this respect, to a prolonged holiday where one loses track of time.

DISCUSSION

Comparing pre and post retirement ratings, there is little indication that retirement produced emotional trauma for workers retiring from positions within large companies having some form of pension scheme. At the very least, the participants did not *report* any such changes. However, when the prospect of retirement loomed, reports were indicative of greater fatigue pre than post retirement. This was found both on the Nowliss-Green and upon the Pearson-Byars fatigue check list and is consistent with other research (Thompson, 1973).

Results therefore offer some support to our expectation that the anticipation of retirement will give rise to conflicts which will be reflected in ratings of fatigue. Following retirement we see that there is a rather marked recovery, which is maintained over several months. Although several explanations for recovery might be given, the most obvious is that the participants no longer have to deal with the work situation, and experience positive aspects of retirement.

Since the number of subjects providing analyzable data was small, we also looked at the changes in fatigue for all subjects during *all* weeks of the

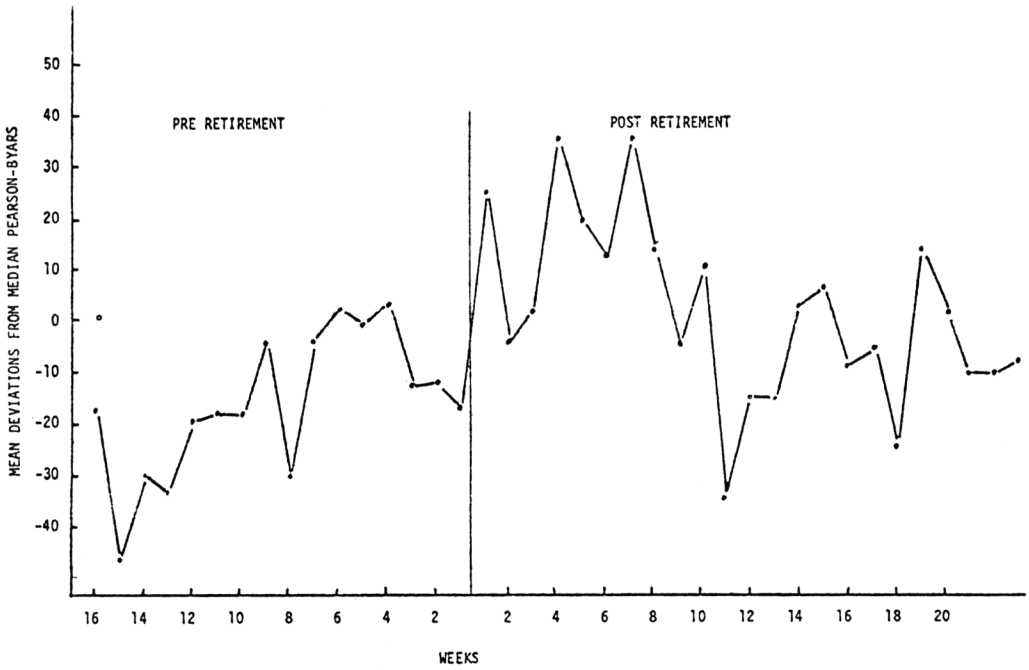


Figure 3. Mean Pearson-Byars (fatigue) scores plotted for each week

experiment. In this case we computed the average fatigue for each week pre and post retirement, using only those subjects who responded for that week. Thus different weeks represent different subjects. In Figure 3 we have plotted these fatigue scores for each week. It seems immediately obvious that there is considerable variation from week to week in rated fatigue. One aspect that is noticeable is that immediately following retirement there is a general elevation in arousal or decrease in fatigue. This arousal however, appears not to be maintained beyond two months post-retirement. Figures 4–6 represent the same data averaged over two, four and six week periods, and show this affect more clearly. One conclusion that may be drawn is that following retirement the retiree at once experiences heightened feeling-tone, reflecting release from work obligations. However, after this brief period of time, when a more stable post retirement frame of

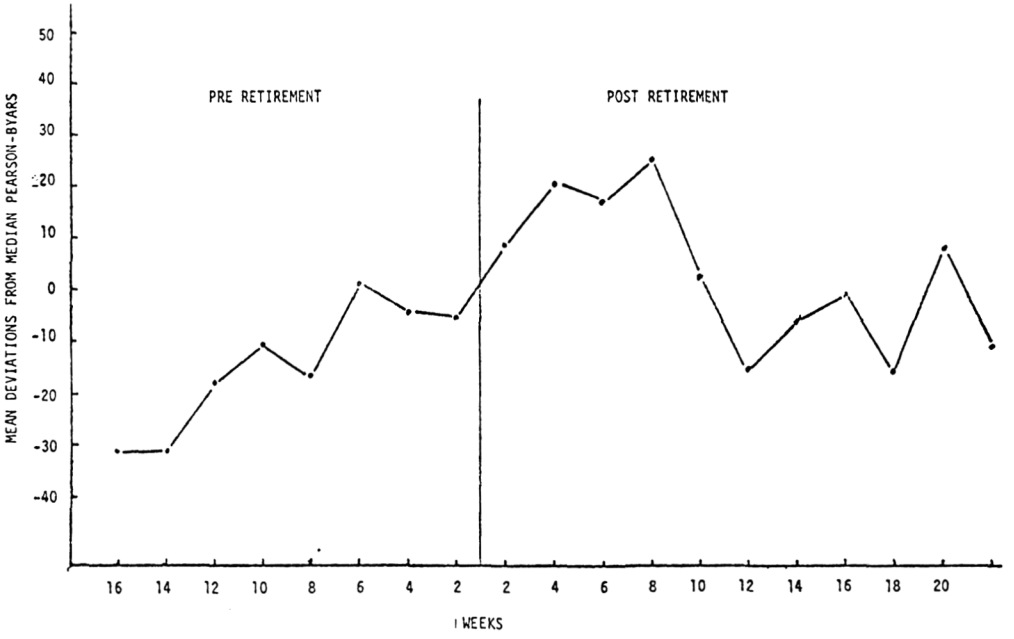


Figure 4. Mean Pearson-Byars (fatigue) scores averaged over two weeks

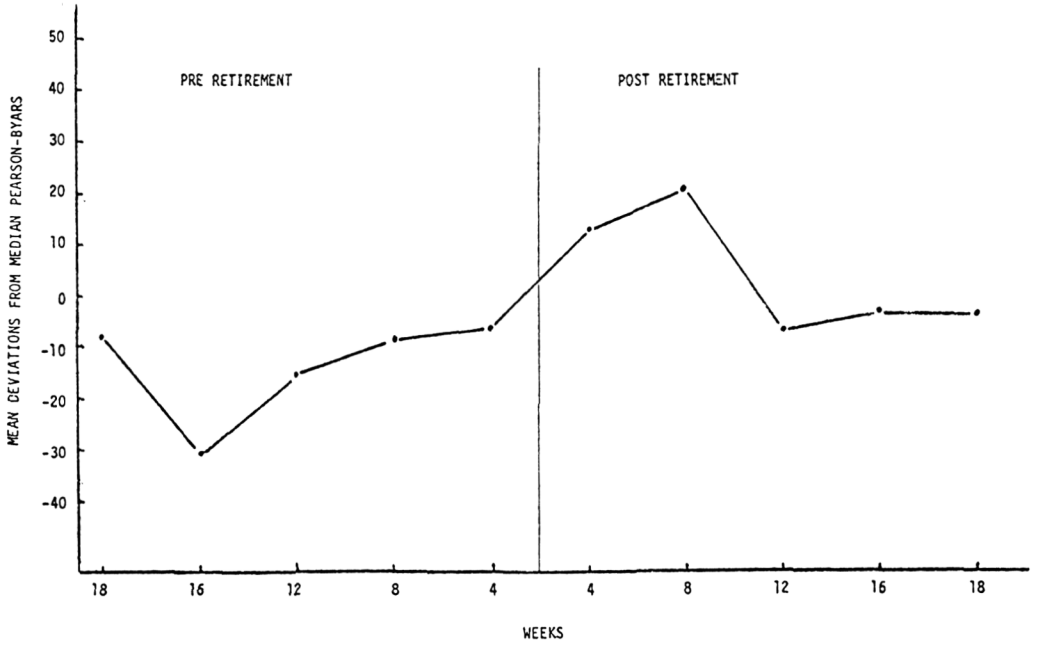


Figure 5. Mean Pearson-Byars (fatigue) scores averaged over four weeks

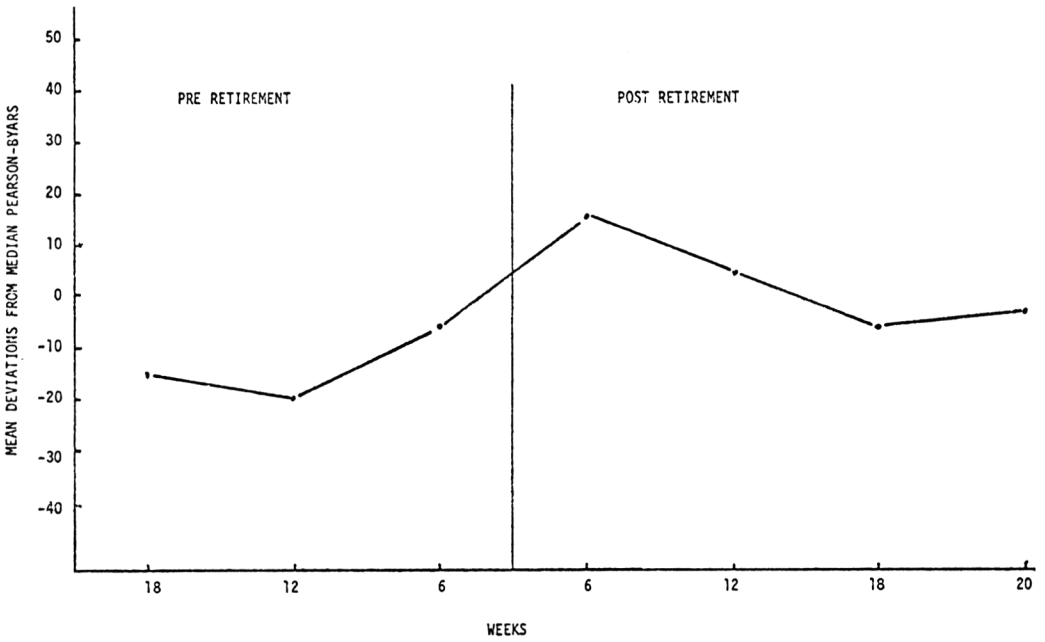


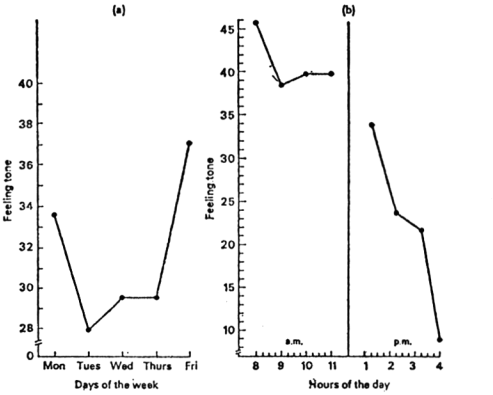
Figure 6. Mean Pearson-Byars (fatigue) scores averaged over six weeks

reference has been established related to their new role expectations, habitual fatigue levels return — the holiday is over as routine again sets in.

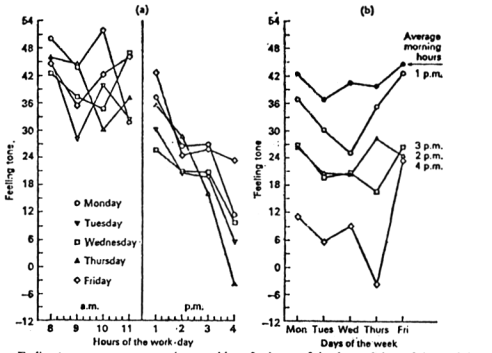
Suggestions for further research:

Several other pieces of information are needed before broad conclusions can be reached. In this study, research measures were always taken at the end of the day and we were inescapably measuring not only the possible conflicts produced by the anticipation of retirement, but also the results of *working*. The power of the time of day variable can be gathered from hourly fatigue levels. Nelson and Ladan (1976) report that for office workers during morning and afternoon hours of an eight hour day, the measure of feeling tone is the inverse of fatigue, indicating a sharp increase in fatigue during work, particularly that done in the afternoon.

Fatigue arising from work itself can be eliminated by making measurement of fatigue levels during various hours of the day. In particular, one might expect that conflict over retirement would be manifested early in the working day as well as late in the day by persons facing retirement, resulting in a less extreme fluctuation of feeling tone. For similar reasons we would like to have hourly figures for people post retirement, expecting that the lack of structure would produce relatively greater conflict early in the day, increasing fatigue relative to pre-retirement morning hour values. Confirmation of this would reinforce the need for preretirement planning.



Feeling tone at (a) each day of the week and (b) each hour of the day, averaged over subjects. Decreasing feeling tone indicates increasing fatigue.



Feeling tone measures averaged over subjects for hours of the day and days of the week in interaction. Consistency in the morning measures in (b) allowed averaging over these four hours.

Figure 7

Also, for the purposes of social planning it would be desirable to know the relationship of real and anticipated role changes to fatigue levels pre and post retirement. And, in light of the conclusions reached from research work including the Third Career Research Society, who drew respondents from the same general geographic areas we did, it might be profitable to relate levels of fatigue to work commitment (Bell, 1975), voluntary vs. involuntary retirement (Peretti & Wilson, 1975), occupational characteristics (Fox, 1977; Fuller, 1976; Jacobsen, 1972, Tallmer & Kutner, 1970), level of income (Heidbreder, 1972), pre-retirement planning (Fuller, 1976; Heidbreder, 1972), personality (Blood, 1967), and sex (Atchley, 1976; Keahey & Seaman, 1974).

Finally, in respect to these factors and fatigue, Singer (1977) presents data showing that adequacy of current functioning has an influence upon experience. Good feeling tone follows good outcomes and poor feeling tone follows failure. If this is true, one might suppose that persons prepared for retirement will have less conflict over retirement, and in consequence, report feeling better in retirement than others who have less in the way of resources and planning, a conclusion supported by Fuller (1976), Bell (1975), Pollman and Johnson (1974), and Thompson (1973). Therefore, the way in which fatigue is distributed throughout the day and the overall level of fatigue both may prove to be indicators of the personal outcome of retirement. Further, research along these lines should be pursued with the hope that individual reports of fatigue and personal symptoms may be able to provide objective indications of successful retirement and pre retirement planning, and the reverse.

Kemp and Kemp (1975), quote the Fatal Accidents Acts of 1846 as extended by the 1959 Act to say:

> There is no question of what may be called sentimental damage, bereavement or pain and suffering. It is a hard matter of pounds, shillings and pence . . . and . . . the damages to be awarded to a dependent of a deceased person under the Fatal Accidents Acts must take into account any pecuniary benefit accruing to that dependent in consequence of the death of the deceased. It is a net loss on balance which constitutes the measures of damages. (p. 215)

When an individual meets death in some accident it is often the case that the survivors may be awarded damages. The amount of these damages may then be interpreted as an index of the relative worth of an individual. Alternatively, one might interpret these damages as reflecting the financial obligations of the victim.

In the following table are the damages awarded for the death of fathers and mothers, husbands and wives, when death occurred as a consequence of an automobile accident. Overall, 70% of all cases involved automobile accidents. Other cases are excluded, primarily because some unusual accidents resulted in rather large awards. If these accidents are included, any nonrandomness in their distribution over age groups may obscure the relationship between amount of damages and age.

TABLE 2

Damages paid in thousands of dollars by *Canadian Courts to survivors (1971-1976)*

Relationship of deceased:		-25	26-35	36-45	46-55	56-65	66+
Father	N	6	15	6	6	2	
	$\bar{X}$	11.6	28.5	13.8	10.6	10	
	Range	8-25	10-70	3.2-25.7	4.8-26	10-10	
	Median	12	22	15	5	10	
Mother	N	4	4	5	2	1	
	$\bar{X}$	9.6	13.3	8.1	5.5	3.5	
	Range	2.5-21	5-24	2-14.5	3-8	-	
	Median	15.5	12	7.5	5.5	-	
Husband	N	6	17	7	8	8	4
	$\bar{X}$	41.2	51.9	39.6	34.8	29.2	25.9
	Range	40-60	15-90	5-130	7.2-108	10-40.3	3.5-75
	Median	46	50	10	22	32	12.5
Wife	N	2	4	5	1	3	
	$\bar{X}$	4.25	21.6	28.3	12	9.3	
	Range	1-7.5	14-27	5-60	-	6.5-13.5	
	Median	4.25	22	24	-	8	
Father & Husband*	N	4	14	6	4	1	
	$\bar{X}$	65	80.47	42.4	23.75	35	
	Range	48-75	37-135	8.5-95	12-30	-	
	Median	68.5	80	40	26.5	-	

* Total damages paid to surviving family, i.e. wife and children.

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