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TESTS OF A MEASURE OF WORK *copy 1*  
AND RESPONSIBILITY IN SOME NAVAL  
UNITS OF THE CANADIAN FORCES

by

D.R. Hansen



ORAE MEMORANDUM NO. M66

**ORAE**

OPERATIONAL RESEARCH AND ANALYSIS ESTABLISHMENT  
DEPARTMENT OF NATIONAL DEFENCE

OTTAWA, CANADA

APRIL, 1975

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## ABSTRACT

Time-Span of Discretion (TSD), a measure of work and responsibility, proved to be measurable in most of the work-roles examined in three naval units of the Canadian Forces. The results showed it to be a valid indicator of work-level and support those who claim that it is used unconsciously by everyone. Rank structure was found to be the prime reference employed by service personnel to assess the 'fairness' of their pay, with TSD serving a secondary role. Most of those interviewed felt themselves to be underpaid, especially those who filled positions of higher rank than their own. The present rank structure for NCOs was found to be poorly suited to organizational needs aboard ship.

## ANALYSE

La période d'autonomie de responsabilité, qui est une mesure de travail et de charge, s'est révélée comme étant mesurable dans la plupart des tâches examinées au sein de trois unités navales des Forces canadiennes. Les résultats de l'étude ont démontré que la période d'autonomie est un indicateur valable de la qualité du travail accompli et confirment le point de vue de ceux qui soutiennent qu'elle est utilisée inconsciemment par tous et chacun. On a constaté que les militaires se basaient essentiellement sur l'organisation hiérarchique pour évaluer le degré d'équité de leur solde, la période d'autonomie de responsabilité jouant ainsi un rôle secondaire. La plupart des personnes interrogées ont déclaré être mal rétribuées, particulièrement celles qui occupent des postes équivalant à un grade supérieur au leur. L'étude a aussi démontré que la structure actuelle des grades de sous-officiers répondait peu aux besoins en matière d'organisation à bord des navires.



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TESTS OF A MEASURE OF WORK AND RESPONSIBILITY  
IN SOME NAVAL UNITS OF THE CANADIAN FORCES

PART 1

INTRODUCTION

1. This memorandum describes results of tests of Time-Span of Discretion (TSD) as a measure of work and responsibility in naval units of the Canadian Forces. The work roles studied were aboard two ships and a submarine. The test continues earlier studies in air support and land element units (Refs. 1 & 2).
  
2. The references noted above contain information about the rationale underlying the conduct of these investigations. Annex A to this report contains a description of the Time-Span of Discretion measure. Historical and descriptive information about the discovery of TSD and its use in organizations can be found in the literature (Refs 3, 4, 5, 6, & 7).

PART 2

OBJECTIVES

3. The objectives of this study were:
  - a. To further test TSD as a measure of military work and responsibility.
  
  - b. To learn if TSD reflects a sense of work level in naval units of the Canadian Forces by:

- (1) Seeing if TSD tends to increase with increasing rank.
  - (2) Seeking evidence of systematic variations of TSD within rank which match some other indicator of work level.
- c. To learn if TSD reflects a sense of fair pay for work done.
  - d. To seek evidence to support or counter the claim that the time-span criterion is used by everyone to assess level of work, although they may not be conscious of its use.

### PART 3

#### PROCEDURE

4. The work done by persons of ranks Private through Major was studied and the TSD of that work measured. Care was taken to ensure that both subordinate and superior had worked together in their present work roles for a minimum of 3 months. The roles studied were selected in a random manner. Whenever possible, chain of command was followed to find roles of higher rank and of lower.

5. The interview procedures used were similar to those employed in the earlier studies. As was done then, independent TSD measurements of the subordinate's work were made through separate interviews of the subordinate and his managers.

6. As had been done in the land force study (Ref 2), each manager was asked how well the work expected of the subordinate matched that individual's talents and abilities. The questionnaire reproduced as Annex B was used for that purpose.

PART 4

RESULTS AND DISCUSSION

TIME-SPAN OF DISCRETION

7. It proved more difficult to measure the TSD of some of these work-roles than any other military roles encountered thus far. This led the interviewers to reject 15% of the measurements as unreliable. This report is based on 102 measurements of work-roles for which the application of the conventional TSD measuring procedures was straightforward. The measurements covered the ranks of Private through Chief Warrant Officer together with Captain and Major; no roles of Lieutenant rank were measured.

8. The measured values of TSD ranged from 1 hour to 12 months.

TIME-SPAN OF DISCRETION AND MILITARY RANK

9. Table I lists mean and median values of TSD, together with sample size, for each of the ranks studied.

10. Except for Master Warrant Officer (MWO) and Chief Warrant Officer (CWO) ranks, the mean TSDs can be seen to increase with increasing rank. The median values show an increase from Private to Major but with some grouping of ranks. These data have been tested to reveal the existence of rank dependent differences of TSD whose significance exceeds 0.01.

TABLE I

Mean and Median Value of TSD by Military Rank

| <u>Rank</u>            | <u>Sample Size</u> | <u>Mean TSD (hours)</u> | <u>Median TSD</u> |
|------------------------|--------------------|-------------------------|-------------------|
| Major                  | (3)                | 1040                    | 1280              |
| Captain                | (7)                | 657.1                   | 320               |
| Chief Warrant Officer  | (4)                | 430                     | 300               |
| Master Warrant Officer | (9)                | 462.2                   | 280               |
| Warrant Officer        | (13)               | 295.4                   | 280               |
| Sergeant               | (13)               | 193.8                   | 160               |
| Master Corporal        | (13)               | 124.7                   | 40                |
| Corporal               | (36)               | 79.8                    | 40                |
| Private                | (4)                | 16.5                    | 12                |

NOTE: The TSD figures in hours given in Table I are based on an assumed 40-hour week and 4-week month.

11. The degree of association of military rank and TSD was determined for 95 officers and other ranks for whom complete sets of TSD, FFP and actual Pay data were available. The measure used was the Index of Order of Association (Ref 8). The value of this index proved to be +0.74 for TSD and military rank. This indicates a relatively high degree of positive association between rank and time-span.

12. The range of TSD values for each rank, marked to show one-standard deviation centred on the mean, is pictured in Figure 1. The range for each rank can be seen to be very wide, with extensive overlapping among ranks. Tests of rank pairs revealed that differences of TSD between some pairs of contiguous ranks were not statistically significant. This was true for CWO & MWO, MWO & Warrant Officer (WO), and for WO & Sergeant (SGT).

13. The existence of overlapping to the extent found in these data suggests that the rank structure in use has more levels than required. Interestingly, this was the complaint voiced by many of those interviewed who claimed that there were too many levels in the SGT to CWO range.



14. The TSD data were examined for other evidence of an excessive number of rank levels. A possible indicator was thought to be the frequency with which ranks were skipped, i.e. how often chain of command failed to include each consecutive level in the rank structure. This was checked by counting the number of levels which separated each subordinate from his manager. The results are listed in Table II for 62 NCOs and Privates. (A level separation of zero (0) indicates that manager and subordinate hold the same rank; the separation is one (1) if they are in contiguous ranks.)

TABLE II

Number of Rank Levels Separating Managers  
And Subordinates in NCO & Private Ranks

|                       |   |    |    |   |   |
|-----------------------|---|----|----|---|---|
| Number of Levels      | 0 | 1  | 2  | 3 | 4 |
| Number of Occurrences | 2 | 19 | 26 | 8 | 7 |

The table shows that manager and subordinate are more than one level apart in 66% of the cases. This is strong evidence that the structure contains more strata than are required.

TSD VARIATION WITHIN A RANK

15. The previous study in the land-based units sought evidence of systematic variations of TSD within a given rank by comparing the manager's assessments of the degree to which the assigned work suited the individual subordinate's talents, to the TSD of that work. The assessment was sought using the questionnaire mentioned in para 6. It was thought that managers, in completing this questionnaire would compare individual performance against some norm they held for the work of the rank. The same approach was planned and the same questionnaire used in this study. As the interviews progressed, a large proportion of individuals were found to hold positions established at a rank

other than their own. In this situation, a manager might assess the suitability of the work against a norm for the rank of the position rather than that of the incumbent; the questionnaire was not designed to detect this, if it occurred... The identification of individuals who were considered to be overqualified for their work had been planned and proved useful.

16. Two ranks were selected for the test. They were:
- a. MWO which coupled the greatest homogeneity of rank (only one non-MWO position) with the next to largest number of work roles for which rank and position were matched.
  - b. CPL which gave the largest total number of work roles (33) in a rank, but contained positions at four different rank levels: CORPORAL/PRIVATE (CPL-PT) 11; CPL - 15; MASTER CORPORAL (MCPL) - 6; SGT - 1.
17. Test results for the MWOs are shown in Table III.

TABLE III

Mean TSD by Work Suitability of MWOs

| Work Suitability Rating | <u>Adequately Matched</u> | <u>Moderately Well Matched</u> | <u>Very Well Matched</u> |
|-------------------------|---------------------------|--------------------------------|--------------------------|
| Sample Size             | (2)                       | (2)                            | (4)                      |
| Mean TSD (hours)        | 140                       | 200                            | 800                      |

As had been found in the land force study, mean TSD increased with increasing 'goodness' of work match. In this case, however, the data do not prove the statistical significance of the differences.

18. The sample of 33 Corporals for whom work suitability assessments were completed included 3 who were said to be over-qualified. The data were tested to see if, as might be expected, the TSD of the work assigned them tended to be higher than the rest. Table IV lists the results.

TABLE IV

Mean and Median TSD by Work Suitability Rating for Corporals  
Classed as (i) Not Overqualified or (ii) Overqualified

| <u>Work Suitability Rating</u> | <u>Not Overqualified</u> | <u>Overqualified</u> |
|--------------------------------|--------------------------|----------------------|
| Sample Size                    | (30)                     | (3)                  |
| Mean TSD (hours)               | 45.1                     | 421                  |
| Median TSD (hours)             | 36                       | 320                  |

The mean and median TSD of those considered overqualified clearly exceed those measures for the remaining 30 Corporals. The differences were tested and found to be statistically significant beyond the 0.1 level.

19. Data for the three overqualified individuals were removed and the remainder examined for TSD differences related to degree of Work Suitability. No statistically significant differences were found. It was then checked to compare TSDs of Corporals in positions which matched their rank with those in positions established at the MCPL or SGT level. Table V shows the results of this comparison.

TABLE V

Mean and Median TSD of 30 Corporals By Rank Level of Position

| <u>Position Level</u> | <u>CPL &amp; C - P</u> | <u>MCPL &amp; SGT</u> |
|-----------------------|------------------------|-----------------------|
| Sample Size           | (24)                   | (6)                   |
| Mean TSD (hours)      | 43.3                   | 52                    |
| Median TSD (hours)    | 28                     | 40                    |

The mean TSD is higher, as is the median for Corporals held against positions which exceed their rank. This result may be due to chance, however, as the differences are not statistically significant.

FELT FAIR PAY

20. The percentage of those who stated a Felt Fair Pay (FFP) for their work was 93%, a level somewhat higher than that found in either the air-support or land-element studies.

21. Most of those who answered the FFP questionnaire gave their assessment in dollars; a few simply said that FFP for their work should be "more" (than they now received); the remainder stated no actual figure but wrote "present pay". The latter expression proved to have two different meanings: some intended it to mean Base Pay plus allowances (sea/submarine); others meant Base Pay only. In analyzing the results, the term was interpreted to mean Base Pay only, unless the interviewee indicated otherwise.

22. About 75% of those who stated a FFP gave a figure which exceeded their present pay, 22% gave figures which matched it; 3% said that they were overpaid for their work.

23. The data were tested to see if the FFP results were influenced by the assignment of individuals to positions whose rank differed from their own. Corporal rank was selected for this test. Table VI lists the mean and median FFP for Corporals serving in the ranks shown.



TABLE VI

Mean and Median FFP of Corporals in Positions  
of Different Ranks

| Level of Position     | <u>CPL &amp; C - P</u> | <u>MCPL &amp; SGT</u> |
|-----------------------|------------------------|-----------------------|
| Sample Size           | (26)                   | (7)                   |
| Mean FFP (\$/month)   | 850.4                  | 908.7                 |
| Median FFP (\$/month) | 837.4                  | 950                   |

Corporals in positions whose established rank exceeded their own can be seen to have higher mean & median FFPs than where the rank of the position and of the incumbent are equal. Although this is a plausible result, tests showed that these data did not prove it.

24. A subsequent test was tried using Sergeant data. It was chosen because the rank of Sergeant provided a sample almost equally divided between positions at two rank levels; SGT - 6; WO - 7. Table VII lists the mean and median FFPs for SGTs in these positions.

TABLE VII

Mean and Median FFP of Sergeants in Positions of Two Levels

| Position              | <u>SGT</u> | <u>WO</u> |
|-----------------------|------------|-----------|
| Sample Size           | (6)        | (7)       |
| Mean FFP (\$/month)   | 962.2      | 1210.7    |
| Median FFP (\$/month) | 933.3      | 1167      |

The results support those obtained for Corporals - mean & median FFP for SGTs in the higher ranking position (WO) exceed those measures where the rank of the position and of the incumbent were matched. The differences were found to be at the 0.05 level, which indicates that they are probably significant.



TIME-SPAN OF DISCRETION AND FELT FAIR PAY

25. The correlation co-efficient between TSD & FFP for officers and other ranks aboard ship was found to be +0.55. This is a lower value than was obtained in either of the other two studies.

26. The possibility that military rank might serve as an intervening variable to explain the relationship between TSD and FFP was investigated using Index of Order of Association as a measure. Table VIII lists the value of this index for three combinations of the parameters TSD, FFP and Rank. (The basic data from which these indices were derived are presented in the annexes.)

TABLE VIII

| <u>Parameter</u>       | <u>Index</u> |
|------------------------|--------------|
| Incumbent's Rank & TSD | +0.74        |
| Incumbent's Rank & FFP | +0.66        |
| TSD & FFP              | +0.55        |

The Index of Order of Association between Incumbent's Rank and TSD can be seen to be +0.74, a value slightly higher than that which defines the association between Rank and FFP. If TSD & FFP were related through rank alone, the Index relating them should have the value +0.49 (the product of the indices in lines 1 & 2). This is not far from the actual value of +0.55, which suggests that military rank may be a significant factor in determining the TSD/FFP relationship in a military organization. The figures given in Table V & VI may be relevant, also, since they suggest that FFP may be influenced by the rank of the position, where it exceeds the incumbent's own rank.

PAY FIELD AND TIME-SPAN OF DISCRETION

27. Data for Corporals were tested to see if those in different pay fields performed work of different levels. No statistically significant differences were found - each field had the same median TSD - 40 hours.

PAY FIELD AND FELT FAIR PAY

28. Data for Corporals were used, also, to study the variation of FFP by Pay Field. Table IX lists the median and mean FFP for the three fields.

TABLE IX

Mean and Median FFP of Corporals by Pay Field

| Pay Field             | <u>A</u> | <u>B</u> | <u>C</u> |
|-----------------------|----------|----------|----------|
| Sample Size           | (7)      | (15)     | (11)     |
| Mean FFP (\$/month)   | 763      | 850      | 900      |
| Median FFP (\$/month) | 782.1    | 861.1    | 916.4    |

FFP can be seen to increase with increasing pay field level; the differences are at the 0.1 level of significance.

29. As noted earlier, the group of Corporals contained individuals serving in positions established at higher rank. Data for these individuals were removed, and the remainder tested to see if the apparent increase of FFP by pay field noted in Table IX might depend upon the existence of these higher ranking positions. Table X shows the results.

TABLE X

Mean and Median FFP by Pay Field for Corporals  
In Corporals Positions

| Pay Field             | <u>A</u> | <u>B</u> | <u>C</u> |
|-----------------------|----------|----------|----------|
| Sample Size           | (6)      | (12)     | (8)      |
| Mean FFP (\$/month)   | 802      | 863.3    | 867.3    |
| Median FFP (\$/month) | 781.5    | 841.5    | 853      |

The statistical measures of FFP now differ little for Pay Fields B and C. The differences shown in Table IX thus appear due to Corporals placed in positions of higher rank, who feel they deserve the pay of that rank. Pay Field A remains at a lower FFP level than the rest, but this distinction may be artificial since tests of the data now reveal that they contain no statistically significant differences of FFP by pay field.

PART 5

SUMMARY AND CONCLUSIONS

MEASURABILITY OF TSD

30. It was possible to measure TSD in 85% of the work-roles studied.

31. Difficulty in applying standard TSD measuring procedures in the other roles is believed due to the way they were managed. The management style used appears to have been influenced by the following factors:

- a. The existence of more NCO ranks than required. In some cases, this seems to have inhibited the delegation of responsibility.

- b. The proximity of manager and subordinate. The ease with which supplementary instructions can be given leads some managers to provide minimal direction when assigning work.

In work-roles whose TSD was hard to measure, one or both of the above effects were usually present. The manager seemed either to be unclear about the quality of the work and the progress he required of his subordinate, or to be unable to specify it. (Lacking this information, the subordinate could not plan his work effectively, which some found to be quite frustrating.)

#### SIGNIFICANCE OF TSD

32. The data show that TSD tends to increase as rank progresses from Private to Major, with some grouping of work-levels. This grouping is consistent with the view of those military personnel who hold that there are too many levels of NCO. The groupings indicate that it has been necessary to force the rank structure to match an organizational requirement of fewer levels. Detection of that fact, using TSD, is evidence of its validity as a measure of military work and responsibility.

33. The study failed to find conclusive evidence of progressive variations of TSD by Work Suitability within a rank, when the rank of the position matched that of the incumbent. Failure to find it may be due to the fact that the Work Suitability questionnaire was not designed for situations where a large proportion of the population filled positions of higher rank than their own. Evidence was obtained to confirm that Corporals who were considered to be over-qualified for their rank tended to have higher TSDs than the rest. The ability of TSD to detect this provides additional evidence of its validity.



34. TSD could not be measured in one work-role at the air-support Base. Subsequent investigation showed that the particular role involved was considered to be an anomaly in the organizational structure. Its detection using time-span analysis suggested that TSD methods might be useful in organizational audits. In this study, TSD proved difficult to measure in work-roles where the relationship between manager and subordinate was as described in para 31 above. This is the type of situation in which Management-By-Objective methods are purported to be effective. The ability of TSD to 'spot' such situations indicates that it may prove to be a powerful device with which to help determine the 'health' of organizational relationships.

#### UNIVERSALITY OF TSD

35. As had been the case in the earlier studies, none of the persons contacted in this one is known to have had knowledge either of the technique of TSD measurement, or of the concept upon which it is based. Despite this, the progression of TSD values, and the groupings by rank where they occurred, matched the subjective judgements of military personnel about the way the rank structure was used. In addition, 'over-qualified' Corporals had TSD levels which were much higher than the rest. These factors support the contention of its advocates that TSD is a quantitative 'read-out' of work and responsibility level which everyone uses intuitively.

36. As had been found for the earlier studies, a high degree of statistical agreement was obtained between TSD measured in the conventional manner, and that based on information supplied by the subordinates alone. The correlation between the two was +0.9. This provides strong evidence that TSD is a 'read-out' of work level which holds a common meaning for manager and subordinate alike, and bolsters the argument for the universality of TSD.



RANK STRUCTURE CONSIDERATIONS

37. The TSD data of Table I show anomalies in the progression of TSD with military rank, e.g. the CPL & MCPL ranks have identical medians, the medians for the upper three levels of NCO are closely grouped. These figures are for a population in which many positions are filled at other than the established rank. In the sample on which Table I is based, the rank of the incumbent matches that of the position in only 68% of the cases. The data were tested to see if the irregular progression of TSD by rank could be due to the presence of these mismatched cases. Table XI lists TSD by military rank for 69 Officers, NCOs and Privates in positions which matched their rank.

TABLE XI

Mean and Median TSD by Military Rank For  
Individuals in Positions Established at Their Rank

| <u>Rank</u> | <u>Sample Size</u> | <u>Mean TSD</u> | <u>Median TSD</u> |
|-------------|--------------------|-----------------|-------------------|
| Major       | (3)                | 1040            | 1280              |
| Captain     | (5)                | 600             | 320               |
| CWO         | (3)                | 466.7           | 380               |
| MWO         | (8)                | 420             | 220               |
| WO          | (6)                | 320             | 320               |
| SGT         | (6)                | 206.7           | 160               |
| MCPL        | (7)                | 88.7            | 40                |
| CPL         | (27)               | 91.9            | 40                |
| Pte         | (4)                | 16.5            | 12                |

The anomalies have not disappeared: CPL and MCPL ranks appear to be more statistically alike than before; the separate existence of WO, MWO and CWO as progressive ranks has not been clarified.

38. In studying civilian organizations, one frequently meets managers who warn against paying too much attention to the official organization chart because they say "that's not how things really work". Resourceful persons usually manage to find some way to operate despite organizational obstacles. The results of this study reveal that naval personnel face such obstacles and are resourceful. The excessive number of NCO ranks appear to present an obstacle to effective command and control aboard ship or submarine. Those involved seem to have sought a workable solution by either by-passing ranks or combining ranks, or both. Table II shows that chain-of-command "skips" over individual NCO ranks 2/3 of the time. Table XI indicated that CPL and MCPL are treated as a single rank, and the upper three NCO levels in somewhat the same way, at least part of the time.

39. There seems little doubt that the provision of a rank structure for NCOs which more nearly matches the requirements for naval vessels would make their operations smoother and more effective, and would improve morale. The TSD data suggest that such a structure should contain three, or at most four levels of NCO, together with that of Private.

#### FELT-FAIR PAY

40. A higher proportion of those interviewed in this study considered themselves to be underpaid for their work than was found to be the case in either of the other two military environments.

41. The FFP results indicate that individuals tend to feel more severely underpaid if the rank of their position exceeds their own, than if their rank and that of the position are matched. (Aboard ship and in submarines, positions frequently appear to be filled by persons whose rank is below that of the established position. Perhaps this practice should be reviewed to assess its impact on morale.)

42. The results of the study show that TSD is not a good predictor of FFP for the work-roles examined, since it 'explains' only 20% of the variance in the FFP data. Some of that variance may be due to the ambiguity noted (para 21) in the FFP questionnaire which would serve to lower the TSD/FFP correlation.

43. The measures of association listed in Table VIII show that rank structure formed the prime reference used by those interviewed to reach decisions about fair pay, with TSD playing a secondary role. This indicates that efforts to match military pay levels to some 'outside' reference will be counter-productive if the resultant scales contain anomalies with reference to the existing military rank structure.

#### PAY FIELD CONSIDERATIONS

44. The TSD data supply no evidence that level of work and responsibility is higher in one pay field than another.

45. The FFP results indicate that the naval personnel interviewed recognize the need for no more than two pay fields, and possibly only one. This agrees with statements volunteered by many of the NCOs interviewed, who claimed that pay should be 'by rank' with additional trades' pay only if individuals pass trades' tests.

# TIME-SPAN DATA SHIP & SUBMARINE WORK-ROLES

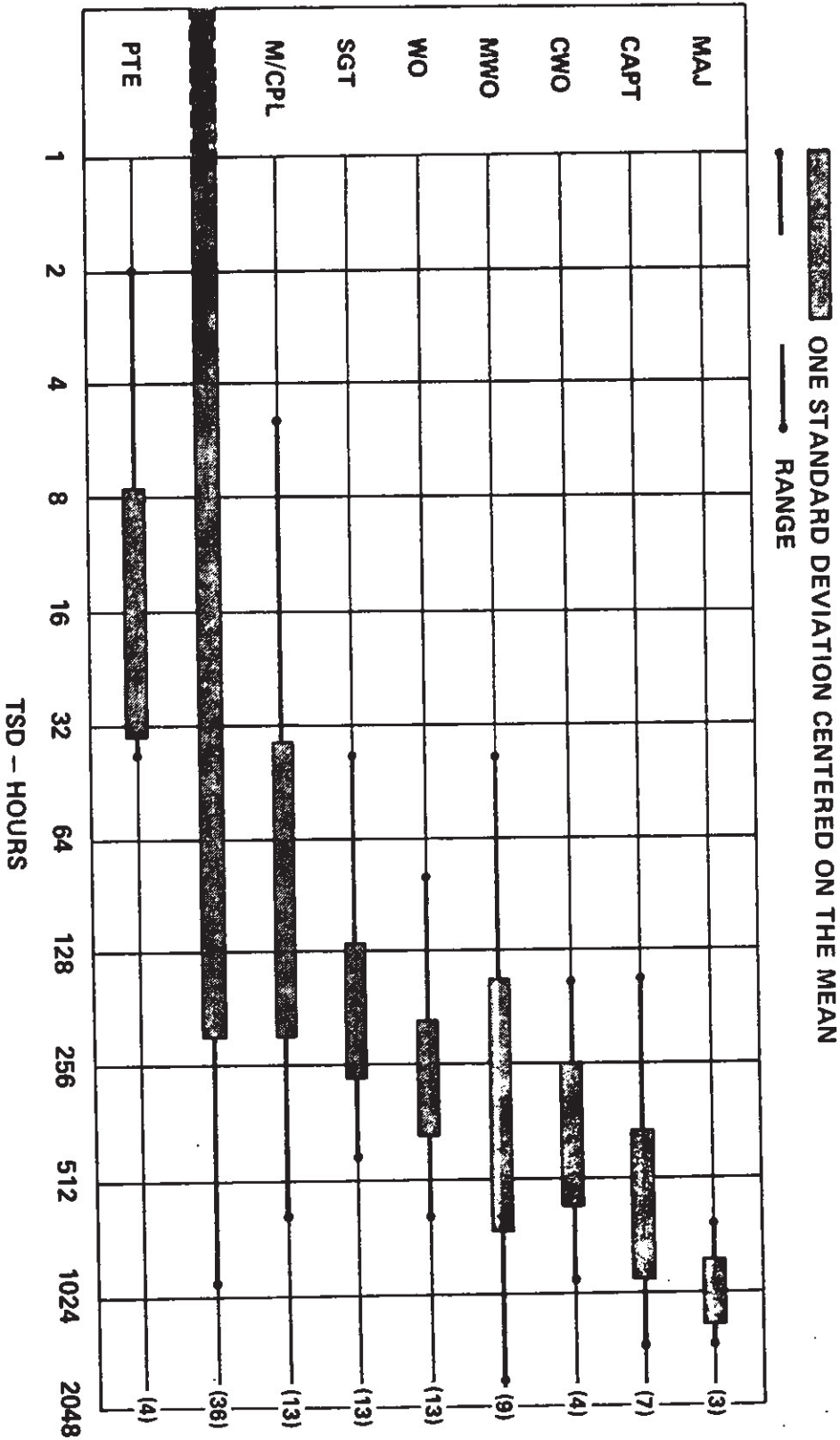


Figure 1

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TIME-SPAN OF DISCRETION

1. Accountability for the work of his subordinates is a requirement of any true manager. To satisfy that requirement a manager must assure himself of the continued adequacy of their work. He does this through periodic reviews whose frequency may differ: the more confidence he has in a subordinate's work, the less frequently will he review it; the less that confidence, the more often will a review be made.

2. Individual subordinates are able to 'sense' the level of work which they are required to perform and to know if that level is either too high or too low for them. If they feel it to be consistently at too low a level, they tend to become bored; if it remains too high, they show symptoms of worry and depression.

3. The proponents of the time-span method of work-level measurement contend that the amount of discretion which a manager allows his subordinate to use is the factor which determines the level of work "sensed" by that subordinate. More specifically they claim that the sensation of 'level' is a direct function of the maximum length of time during which a manager permits his subordinate to exercise independent judgment in the pursuit of a task. This has been called the "Time-Span of Discretion" of the work role and has been defined by Elliott Jaques as follows:

"The longest period of time which can elapse in a role before a manager can be sure that his subordinate has not been exercising sub-standard discretion continuously in balancing the pace and quality of his work."

The units of time employed in TSD measurement are hours, days, weeks, months or years, as appropriate.

ANNEX A

4. Jaques has identified two different types of work roles; the technique of TSD measurement differs for the two. The first is the 'Single-Task' role in which a subordinate performs tasks, one at a time, in the order in which they are assigned. In this case the subordinate's exercise of discretion is limited to decisions about the method and speed with which each task is to be performed. In such a role, a manager may review the work during the progress of a task, immediately upon its completion, or at some later time. The review may be a direct one by the manager, or it may be accomplished indirectly on the basis of information obtained from others. Whatever mechanism is used to perform the review, the TSD of a single-task role is found by determining the longest period of time which the manager is prepared to let elapse between the start of any task and his review of it.

5. The second type is the 'Multiple-Task' role. In it the subordinate carries responsibility for a number of concurrently existing tasks. In this case, part of the job is to 'program' the progression of each task so that all are completed 'on-time', and in an acceptable manner. For this type of role, TSD is established by that task to which the manager assigns the longest unreviewed target-completion time.

6. The above discussion describes, in a rudimentary way, the main principles of time-span measurement: a detailed description of the techniques can be found in Jaques' TIME-SPAN HANDBOOK.

7. In practice, the measurement of TSD can prove to be rather more difficult than might, at first, appear to be the case. However, the sum of the training and experience required to use the method effectively is not greater, and is probably less, than is needed to assure the successful application of conventional job evaluation techniques. Certainly the total time required of manager, subordinate and analyst is less for time-span analysis, than for job evaluation methods.

QUESTIONNAIRE

(The purpose of the questionnaire was explained before the manager was asked to complete it: It was needed to help interpret the results of the study, not to judge the individual; a man might do poorly in one job for which he was unsuited, but do well in another he was 'matched' to; the questionnaire was intended to measure the degree to which work-matched-man.)

WORK SUITABILITY

How well does his present work match \_\_\_\_\_'s capabilities and talents?

A. Very Well

B. Moderately Well

C. Adequately

D. Rather Poorly

E. Very Poorly

TABLE C-1

TIME-SPAN OF DISCRETION BY MILITARY RANK

| RANK                   | TSD (hours)   |                |                 |                  |                  |                |  |
|------------------------|---------------|----------------|-----------------|------------------|------------------|----------------|--|
|                        | 0<br>to<br>25 | 26<br>to<br>50 | 51<br>to<br>100 | 101<br>to<br>200 | 201<br>to<br>400 | 401<br>to<br>→ |  |
| Private                | 3             | 1              |                 |                  |                  |                |  |
| Corporal               | 15            | 10             | 2               | 4                | 1                | 1              |  |
| Master Corporal        | 2             | 5              | 2               | 2                | 1                | 1              |  |
| Sergeant               |               | 2              |                 | 8                | 1                | 2              |  |
| Warrant Officer        |               |                |                 | 4                | 4                | 3              |  |
| Master Warrant Officer |               | 1              | 1               | 1                | 4                | 2              |  |
| Chief Warrant Officer  |               |                |                 | 1                | 1                | 1              |  |
| Captain                |               |                |                 | 1                | 2                | 3              |  |
| Major                  |               |                |                 |                  |                  | 3              |  |

INDEX OF ORDER OF ASSOCIATION OF RANK AND TSD = +0.74.

TABLE C-2

FELT-FAIR PAY BY MILITARY RANK

| RANK \ FFP (\$/month)  | 0 to 650 | 651 to 800 | 801 to 950 | 951 to 1100 | 1101 to 1250 | 1251 to → |
|------------------------|----------|------------|------------|-------------|--------------|-----------|
| Private                | 3        | 1          |            |             |              |           |
| Corporal               | 1        | 12         | 14         |             | 2            |           |
| Master Corporal        | 1        | 2          | 6          | 2           | 2            |           |
| Sergeant               |          | 1          | 3          | 4           | 3            | 2         |
| Warrant Officer        |          |            |            | 3           | 4            | 4         |
| Master Warrant Officer |          |            |            | 3           | 6            |           |
| Chief Warrant Officer  |          |            |            |             | 1            | 2         |
| Captain                |          |            | 1          | 2           | 1            | 2         |
| Major                  |          |            |            |             |              | 3         |

INDEX OF ORDER OF ASSOCIATION FOR RANK AND FFP +0.66



TABLE C-3

FELT-FAIR PAY BY TIME-SPAN OF DISCRETION

| TSD (hours) \ FFP (\$/month) | 0 to 650 | 651 to 800 | 801 to 950 | 951 to 1100 | 1101 to 1250 | 1251 to → |
|------------------------------|----------|------------|------------|-------------|--------------|-----------|
| 0 - 25                       | 2        | 7          | 6          | 4           | 1            |           |
| 26 - 50                      | 3        | 6          | 7          |             | 3            |           |
| 51 - 100                     |          | 2          | 1          | 2           |              |           |
| 101 - 200                    |          |            | 5          | 5           | 7            | 4         |
| 201 - 400                    |          | 1          | 3          | 2           | 6            | 2         |
| 401 -                        |          |            | 2          | 5           | 2            | 7         |

INDEX OF ORDER OF ASSOCIATION OF TSD AND FFP = +0.55

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KEY WORDS

measure of work  
fair pay  
time-span of discretion  
work suitability  
pay field

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