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ABSTRACT

After reiterating the findings of an earlier examination of job literacy, this paper discusses the results of a job literacy survey involving interviews with 107 individuals representing 100 occupations ranging from short-order cooks and assembly-line workers to lawyers and corporation vice-presidents. Other aspects of the research findings presented include an examination of the general nature of on-the-job literacy tasks, the difficulty of job materials, the relationship between that difficulty and an individual's reading ability, the relationship between literacy and job success, and the characteristics of competent and noncompetent readers. The paper also points out problems inherent in research that attempts to define a national, generalized, functional literacy. (AEA)

AN EXAMINATION OF WORK RELATED LITERACY AND READING ATTITUDES

by

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Paper Presented at Functional Literacy Conference
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Toward the beginning of this decade, Amiel Sharon (1973), in reporting on the Educational Testing Service survey of adult reading habits, noted that most reading performed by American adults was of newspapers, magazines, books, and job related reading. The least studied of these four areas was job related reading. Since the ETS study, further work has been done to examine job related literacy.

We at Indiana University have been attempting to examine adult job literacy using a broadly based approach which incorporates a full range of occupation levels and which attempts to account for such attitudinal and behavioral variables as general reading attitude, literacy motivations, job interest/satisfaction, alternative literacy strategies available, and general reading habits. Our approach has been to gather general information on subject reading ability and habits, job experience, and demographic standing before making a specific and individual analysis of the job-literacy demands and abilities of each subject. This work has been proceeding for the past two years with funding from the Spencer Foundation.

The first phase of the study, a cross-sectional survey and analysis of

general and job related reading habits and attitudes has been completed. The results are described in Adult Reading Habits and Attitudes (Mikulecky, Shanklin, and Caverly, 1979). The second phase of our studies, which is currently in progress, extends the research to examine more specifically and extensively job literacy in a variety of on-the-job settings which generally reflect the occupational levels represented in the Dictionary of Occupational Titles.

ADULT READING HABITS AND ATTITUDES

This paper will not attempt to summarize the total results of the Mikulecky, Shanklin, and Caverly (1979) study, but will point out a few germane findings as a backdrop for a more focused examination of job literacy. The results are based upon responses of 284 subjects from a community demographically representative of the nation, contacted through random sampling techniques used extensively in the broadcasting industry.

The mean job reading time reported by these survey respondents was 73 minutes daily with a range that extended from 0 to over eight hours and a standard deviation of 98.7 minutes. No significant differences were apparent when results were analyzed by race, sex or income. Job reading time, analyzed by subjects' educational level ranging from high school drop-out to graduate level, revealed a difference significant at the $p < .05$ level, but the difference was not so pronounced as to be apparent in post-hoc Scheffe test pair-wise comparisons between educational levels.

Subjects were asked to rate the degree of discomfort experienced with job

related reading. Analysis of responses by demographic groups revealed that nearly every group expressed general comfort with job reading demands (means between 1 and 2 on a 5 point Likert scale). Statistically significant differences ($p < .05$) in degree of discomfort were found for the variables of education and race with high school drop-outs and blacks experiencing more discomfort. In total, only 11.3% of the sample reported discomfort with job reading demands. No significant differences were found when discomfort was analyzed by sex or income.

The survey included several items designed to assess motivations for reading. Some of the motivations surveyed relate directly to job reading. Item 26 asked respondents to rate themselves on the degree they read "to find out how to get something done." No significance was found when responses were analyzed by race, education, or income, but a significant difference ($p < .05$) was found when the responses were analyzed by sex, with men responding more strongly. The same response results were apparent for item 23, which assessed the degree to which subjects went to books or manuals for information about problems on the job.

Subject responses demonstrated no significant difference on any demographic variable for item 30 which assessed reading for occupational and personal advancement.

Women, as a group, were motivated significantly more to read for "relaxation or pleasure" and "to discuss with friends." In addition, women rated higher than men on total reading time, free reading time, and reading attitude as

measured by the Mikulecky Behavioral Reading Attitude Measure (Mikulecky, 1976).

To eliminate the confounding influence caused by the imbalance in employment of men in relation to women, some comparisons were made between full-time employed men and full-time employed women. It was found that full-time employed women did significantly ($p < .05$) more job related reading than full-time employed men and also significantly more free or leisure reading than the men. No significant differences, however, were found between the free reading times reported by full-time employed women and other other women.

The results reported above are drawn from a demographically representative sample, but must be qualified by the fact that they are entirely self-report data. Survey results suggest that a large majority of adults are comfortable with the reading demands of their jobs, but a significant minority (11%) are not. Full-time employed women report spending more time doing job reading, but that extra job reading hasn't kept them from doing as much leisure reading as other women and considerably more leisure reading than men. Perhaps most interesting is the general lack of effectiveness in using demographic variables other than sex as predictors of adults reading patterns. Education level of subject demonstrates sporadic effectiveness, but does not reveal differences significant enough to bear up under pair-wise comparisons.

FUNCTIONAL LITERACY ASSESSMENT

The second phase of the adult reading studies examines the relationship to

job literacy of reading attitude, motivation, discomfort and of other behavioral variables such as the reading strategies employed by subjects. In an attempt to avoid some of the pitfalls of survey research with standardized measures, this second phase interviewed workers in on-the-job settings using actual job materials. This paper will present the study rationale and methodologies along with a few preliminary results.

Functional literacy, in both the professional and popular press, is often equated with overall competency (see Kirsch and Guthrie, 1978, for a discussion of this problem). Obviously, a worker can be functionally illiterate (i.e. he cannot read the materials supposedly necessary to complete a task) and yet be competent (i.e. he accomplishes the task anyway because of previous experience, common sense, etc.). Scribner and Cole (1973) and Olson (1975) indicate that attitudinal and behavioral characteristics--other than simple literacy skills--have a greater impact on competency. In one of the few studies to address this question, Sticht (1975) found a low correlation (.30 to .40) between reading ability and on-the-job performance tests. Factors other than reading ability and difficulty of literacy materials need to be taken into account in understanding functional literacy.

Past literacy assessments have used either self-report data (e.g. number of years of schooling completed; ability to read a simple sentence in any language), standardized tests, or tests constructed from representative reading and writing tasks in order to assess the extent of illiteracy in this country. The use of representative tasks comes closest to measuring 'functional' literacy. Such

tasks are, however, only representative, and do not necessarily measure individuals' abilities to handle the literacy demands they are actually faced with and thus in many cases do not measure functional literacy. Furthermore, attitudinal and behavioral dispositions towards literacy and literacy tasks which may impact on literacy competency are rarely addressed in such assessments. Perhaps most importantly, functional literacy tests have been given in an artificial (a testing) situation--a situation that deprives the individual of access to the extralinguistic cues that he/she might--in a more natural context--use to help complete the literacy task. If functional literacy means the ability to read and write well enough to function in a situation, then perhaps it can only be meaningfully examined in the situation itself where an individual has access to information beyond the printed word to aid in completing the task.

The need exists, then, to examine functional literacy in the actual contexts where the literacy demands occur; furthermore, attitudes, motivations, and contextual influences that may impact on a person's functional literacy ability need to be examined in its variable nature. The fact that most previous functional literacy studies (with the notable exception of the work done by Sticht et. al.) have failed to take these points into account is due in large part to the purposes of these studies. APL (Northcutt, 1975), the Adult Functional Reading Study (Murphy, 1975), the Survival Literacy Study (Louis Harris and Associates, 1970, 1971) and the Mini-Assessment of Functional Literacy (Gadway and Wilson, 1975) because they sought generalizable information about the extent of literacy ability in this country had to confine their assessments to representative tasks

and somewhat artificial testing situations.

EXAMINATION OF LITERACY ON JOBS

Results from the Mikulecky, Shanklin and Caverly (1979) study provided baseline data on some of the variables felt to be associated with functional literacy. The next stage of this investigation involved examining functional literacy in a real context, and collecting data not only on demands and competencies but on attitudinal and behavioral variables as well. This information was collected in job situations since the workplace was easily identifiable and examples of literacy tasks could more easily be collected and examined. A Job Literacy Survey (Diehl and Mikulecky, in Diehl, 1979) was developed, based on the Mikulecky, Shanklin and Caverly study and on earlier studies by Sticht (1975, 1978), Smith (1974), and an HEW Task Force on Work in America (O'Toole et. al., 1973). This survey was composed of several parts:

--Respondents ranked statements designed to assess attitude towards reading (the Mikulecky Behavioral Attitude Reading Measure), and towards the job (drawn in part from O'Toole et. al.).

--Respondents completed two check sheets listing possible reading and writing tasks that they encounter on the job.

--Respondents were asked direct questions about reading and writing demands on the job. Specific titles were collected, and respondents were asked questions to determine the strategies used to get the information needed from the text. The importance and the extent of usage of each piece of material cited was also assessed.

--Respondents completed a cloze test designed to get some assessment of general literacy ability; where possible (in 35 cases) respondents also completed a cloze test using a piece of their own job material as the basis.

--Materials cited as being read or written on the job were collected and later analyzed for reading difficulty. Several measures of readability were employed; the FORCAST measure (Sticht et. al., 1975) proved the most useful for these job materials.

One hundred and seven individuals representing 100 occupations ranging from short-order cooks and assembly-line workers to a lawyer and a vice-president of a large corporation participated. Subjects were chosen through a random selection of businesses, industries and workplaces within a 70 mile radius of Bloomington, Indiana. Once workplaces were chosen, and once they agreed to cooperate, one person at each job-level in the workplace was interviewed. Over twenty workplaces cooperated in the study.

Although it was impossible to ensure total random selection of subjects within workplaces, the sample obtained was representative of national norms in terms of income, race, sex, and duration of employment. Furthermore, the scores on reading attitude measures were comparable to those obtained in the Mikulecky, Shanklin and Caverly study. This is not to suggest that results of this study are generalizable, but an attempt was made to use a population that reflected the diversity of the workplace. Much of the data was self-report, and because literacy was being examined as a variable construct--hence unique to each individual--results can only serve as indications of the interrelationships that affect functional literacy.

LITERACY TASKS ENCOUNTERED ON THE JOB

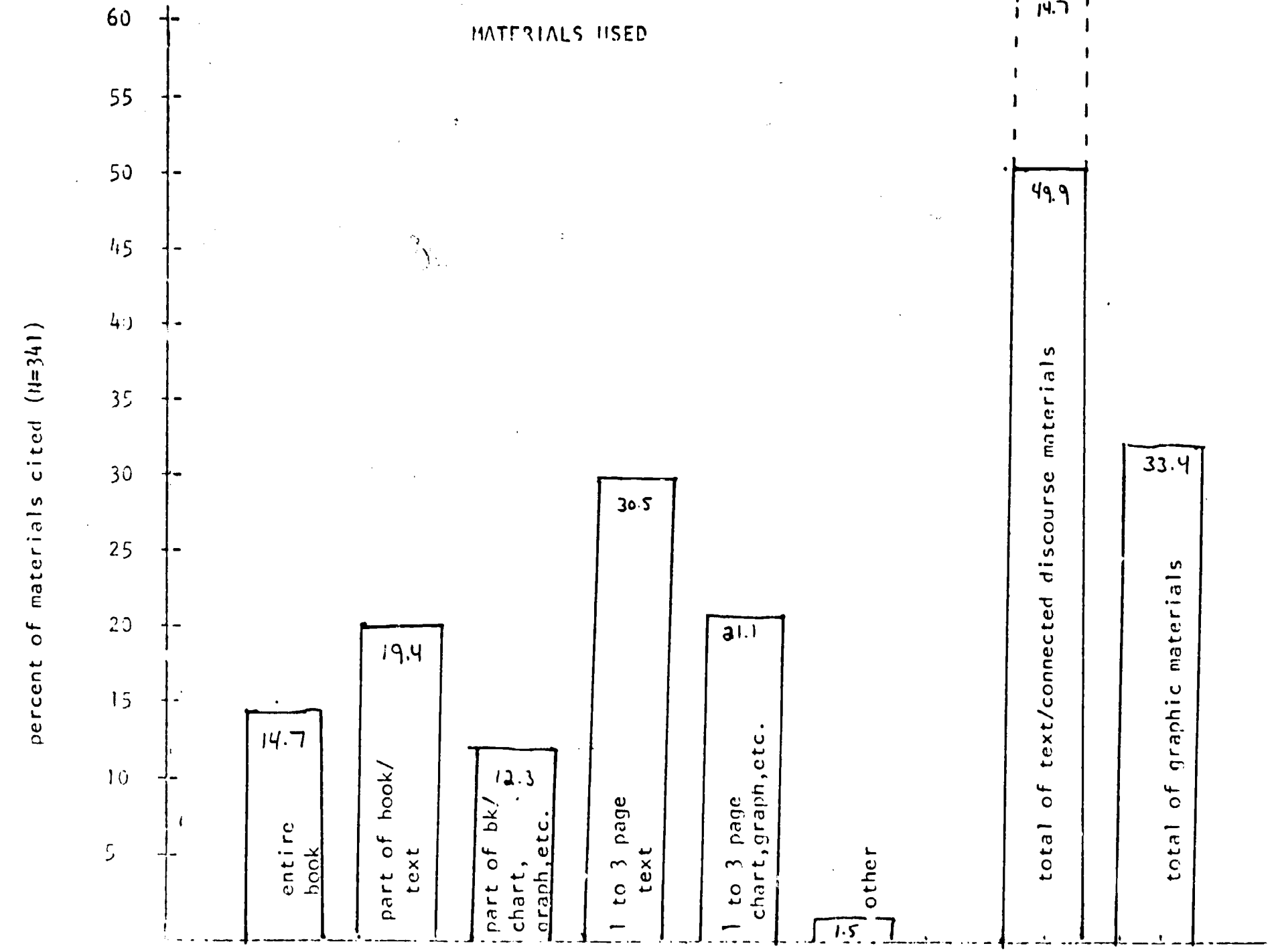
Specific instances of reading and writing done on the job during the previous month were collected from each interviewee. Despite the fact that many interviewees indicated at the beginning of the interview that they did not read or write at work, only two were unable to cite any literacy tasks. This tends to conflict with Sharon's (1973) survey which reported that only 33 percent of the adult population reads at work and that those who do tended to have a higher socio-economic status. The difference in results (with this research indicating that close to 99 percent of the sample read at work) can be seen as due to the ubiquitous nature of functional reading. It was only with some probing that several interviewees "remembered" reading that they did; the reading was so much a part of the task (e.g. looking up a parts number in a book in order to repair a machine) that it was often discounted as being "not really reading."

The materials cited as being read on the job were first classified according to how the material was presented (see Chart 2). Over half the material (51.6 percent) was only a few pages in length. Connected text was used more often than charts, graphs, tables, and diagrams (49.9 percent to 33.4 percent; data was not collected on type of display when a full book was cited). Although the ability to read graphic displays is clearly important in job reading, textual material is used more often. On the other hand, when asked to cite the importance of the material in completing a task, respondents generally ranked the graphic display materials as more important. Much of the textual material either was not necessary to complete a task, or could have been supplemented with information gotten a different way.

CHART 2

TYPES OF READING DONE ON THE JOB:

MATERIALS USED



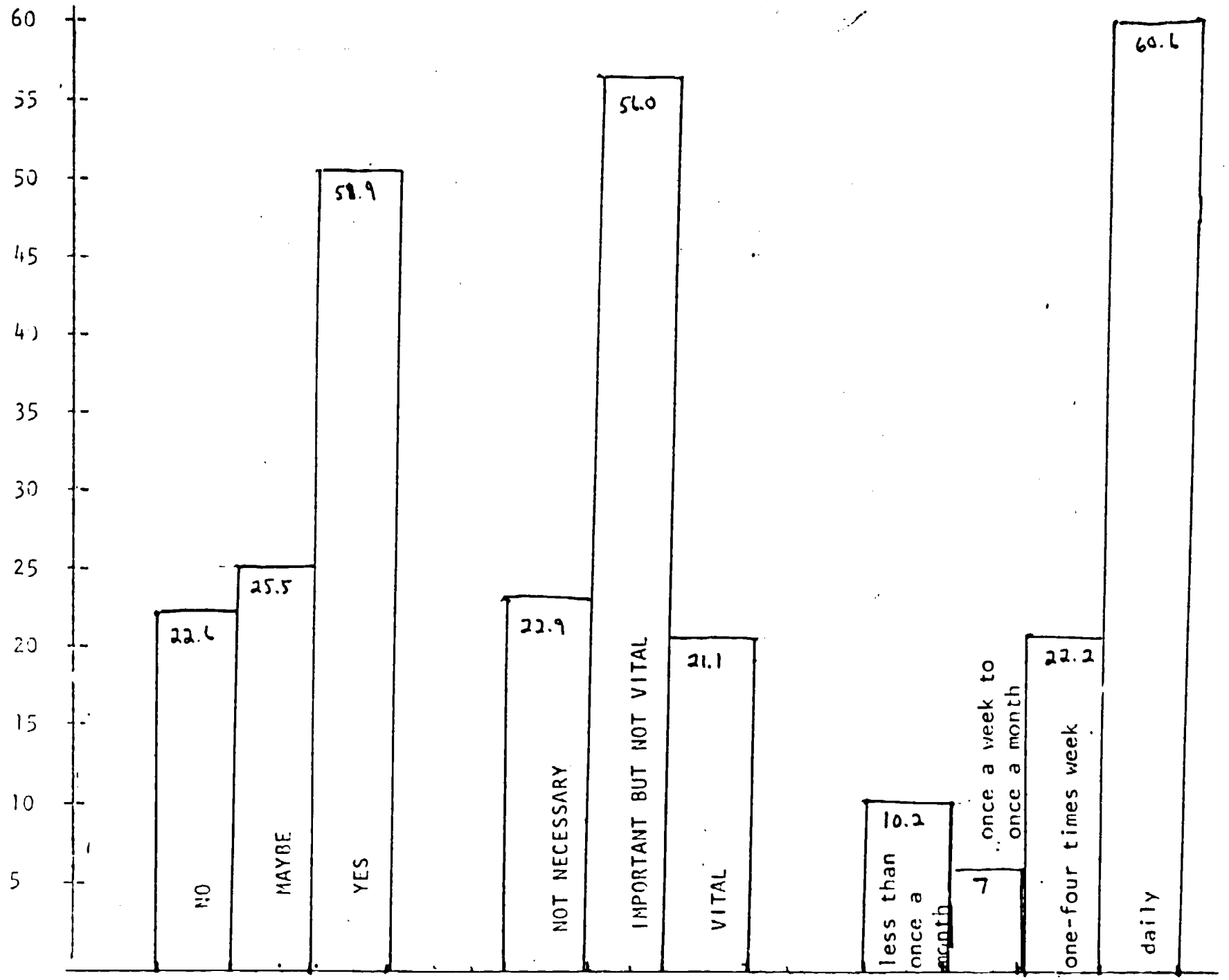
Interviewees were asked several questions about each piece of job reading material to determine: a) if the same material would be used again to complete the same task; b) how important the material was in completing a job task; and c) how often the same type of material was used (see Chart 3).

Over half of the respondents (51.9 percent) would read the same material again the next day if they had to do the same task. Thus, these individuals did not try to learn the material. Rather, the material was viewed as a sort of external memory, available for use whenever the task warranted it.

Of the materials cited, only 21.1 percent were felt to be "vital" to completing the job task. 22.9 percent were not felt to be necessary at all. The majority of materials--56.0 percent--were felt to be important, but not vital; interviewees indicated hat the job could have been completed and/or the information could have been obtained without reading the material itself. Graphic materials tended to be seen as more important--or vital--than text material. It would appear that much of the reading at work cited by interviewees was not necessary and was done by choice often to make a task easier. It may be that the literacy "demands" of occupations are far less than we had realized.

Interviewees also indicated that they read the same types of materials often. Over 60 percent of the materials cited were read "daily." An additional 22.2 percent were read one to four times a week. Such repetitiveness could account for subjects' job cloze test scores which revealed significantly higher ($p < .05$) grade level equivalents than did their general reading cloze test score grade equivalents.

CHART 3



If you had to do the same task tomorrow, would you read the material again?

Importance of the reading material in accomplishing task

Number of times this type of material used on job.

Interviewees were also asked questions designed to reveal the strategies employed in using the job materials. Based on earlier work by Sticht (1978), and on a field-testing, four broad categories and several sub-categories of strategies were generated. These were as follows:

A. Reading-to-learn tasks (in which the individual applies strategies designed to ensure retention of material read). (These categories are from research done by Sticht et. al., 1976; Sticht, 1978).

"1. Reread/Rehearse (involves repeating the processing of information taken from the text, with minimal elaboration or transformation).

2. Problem Solve/Question (involves answering text questions, solving problems in the text . . .).

3. Relate/Associate (involves the use of mnemonics; discussion of material; associations of new information with other information; elaboration).

4. Focus Attention (involves activities which reduce the amount of information in some manner, e.g. underlining . . . outlining, taking notes)" (Sticht, 1978, p. 15).

B. Reading-to-do tasks (with no incidental learning) (involves using material as a reference or 'exterior memory' for completing a task) (categories adapted from Sticht, 1978).

1. Fact-finding in text.

2. Fact-finding using charts, graphs, tables, etc.

3. Following directions using text.

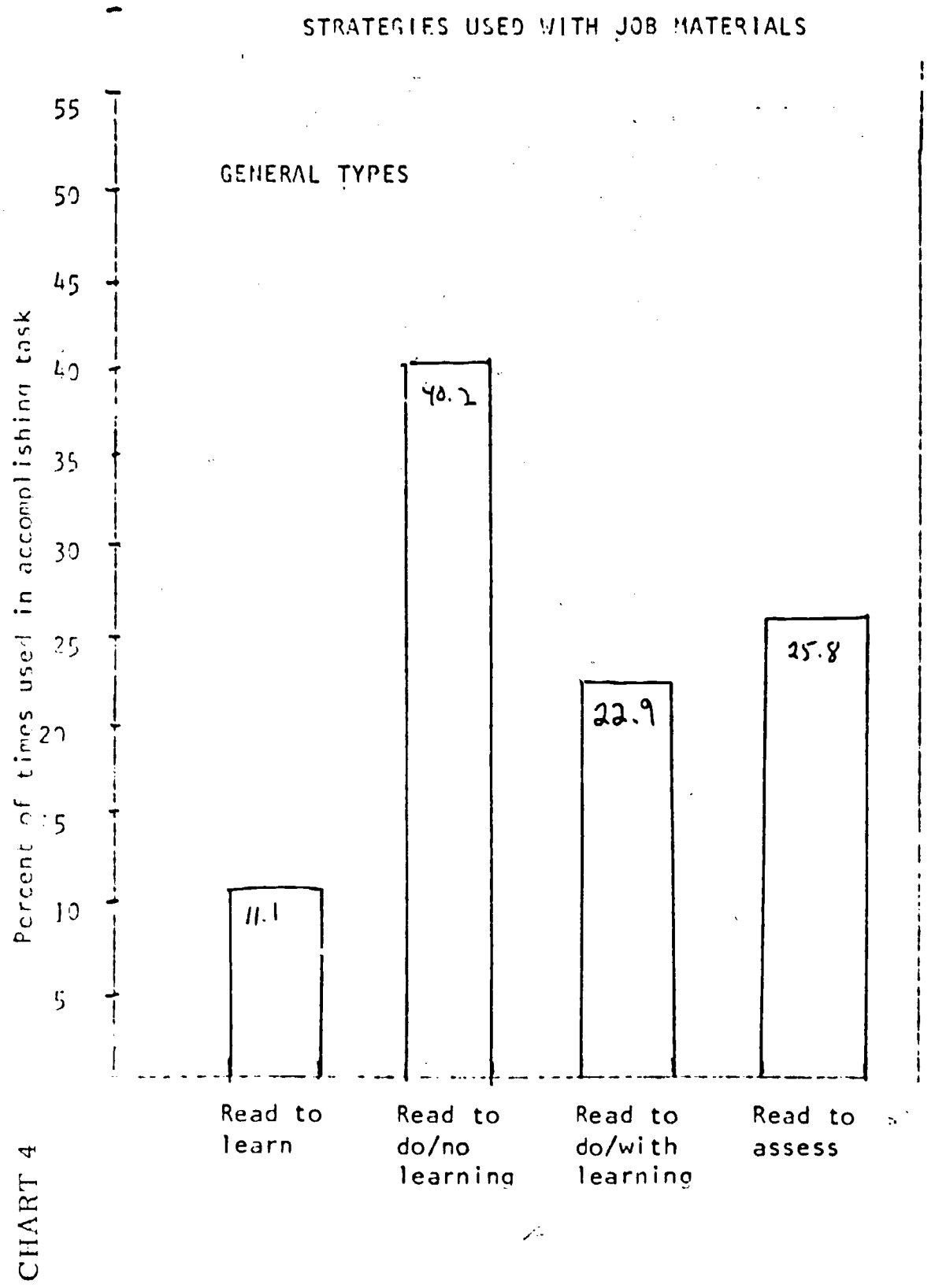

STRATEGIES USED WITH JOB MATERIALS
GENERAL TYPES
Percent of times used in accomplishing task
55
50
45
40
35
30
25
20
15
10
5
11.1
40.2
22.9
25.8
Read to learn
Read to do/no learning
Read to do/with learning
Read to assess
TYPE OF STRATEGY USED

CHART 4

4. Following directions using charts, graphs, tables, etc.

C. Reading-to-do tasks with incidental learning (involves using material as a reference to complete a task, but learning the material in the process so that the material ceases to function as 'external memory').

1. Use of special study strategy (like ones mentioned in A, e.g. re-read/ rehearse, focus attention, etc.).
2. Repetition of reading tasks over days or months caused learning to occur (several trial learning).
3. Retention of reading information through application to a job task (single trial learning; e.g. a worker reads directions, does the task, and henceforth remembers how to do the task without referring back to the directions).

D. Reading to assess (involves strategies aimed at quickly going through material in order to reach decisions about its use) (categories based on field-testing of survey).

1. Assessing usefulness for a particular task.
2. Assessing whether to read the material more carefully later (or to use the material later to help prepare reports, etc.).
3. Assessing whether to pass the materials on to someone else.
4. Other.

Data collected using the Sticht categories has gone through preliminary analysis. It appears from preliminary results that job-reading tasks are used to do something else i.e. Section B of Sticht's categories). In these cases,

the reader usually has access to information beyond the printed page--he/she often has a machine to match with a diagram, a form to match with printed figures, etc. Sample percentages of responses are found in Charts 4 through 8.

DIFFICULTY OF JOB MATERIAL

Wherever possible, materials read or written on the job were Xeroxed and later analyzed. Readability formulas were applied to those job materials that lent themselves to readability. The Fry, Fog, Cloze, and FORCAST readabilities were all applied to 20 pieces of material. (The vast majority of the 341 pieces of material were inappropriate for readability formula analysis.) Both Fry and Fog proved to be unusable in a majority of the 20 cases. FORCAST readability, reported to be reliable on job materials (Sticht, 1975, pp. 26-32) are reported in Chart 10.

Using FORCAST, the average readability of job materials analyzed was 10.9. It must be noted that only materials that contained 150 words in connected discourse could be analyzed. Much of this material came from higher status jobs. Thus, a reading difficulty of 10.9 is an overestimation of the difficulty of all the materials collected. Assessing the difficulty of charts, graphs, tables, and diagrams poses particular problems; clearly, this is an area of needed research in job related literacy.

Reading Difficulty and Competency

Readability of 1st sample	$\bar{x}$ = 10.9	sd = 1.45	(57 pieces)
Readability of 2nd sample	$\bar{x}$ = 11.1	sd = 1.35	(31 pieces)
Readability of 3rd sample	$\bar{x}$ = 10.8	sd = 1.35	(12 pieces)
Readability of 3rd sample	$\bar{x}$ = 11.7	sd = 1.04	(6 pieces)
Overall difficulty	$\bar{x}$ = 10.9 (Range 8.4-13.8)	sd = 1.2	(106 pieces)

3. STRATEGIES USED WITH JOB MATERIALS

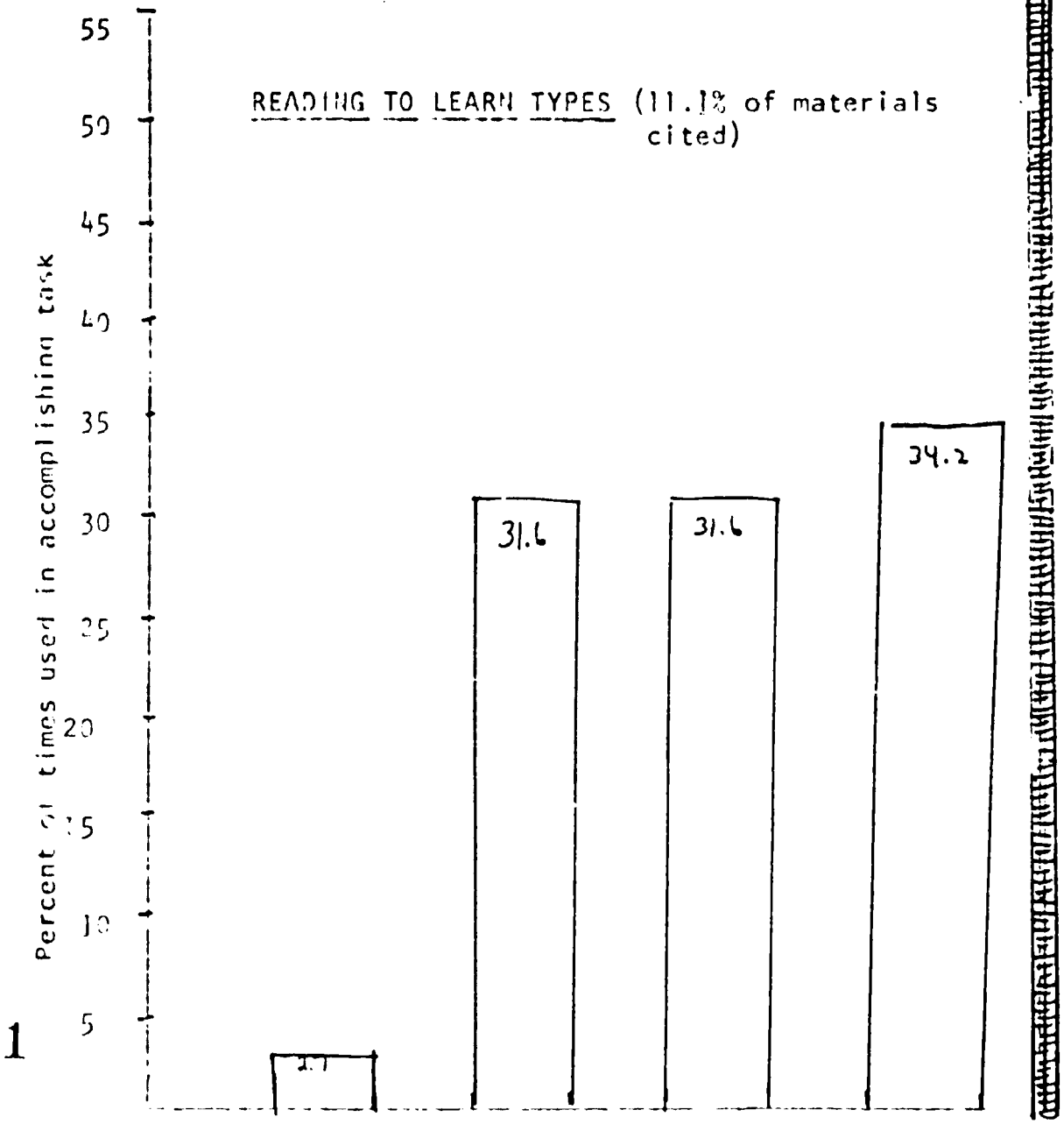


CHART 5

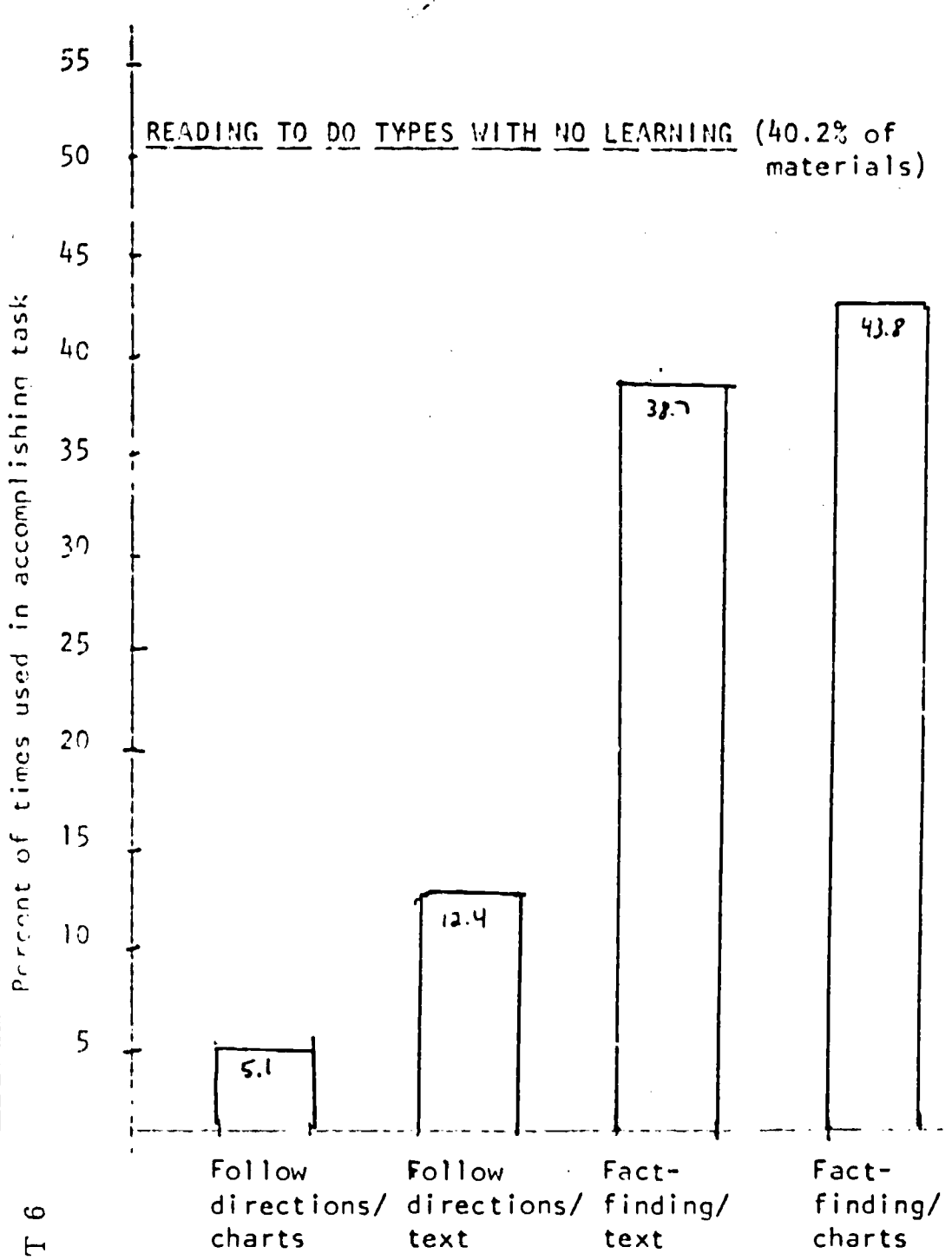
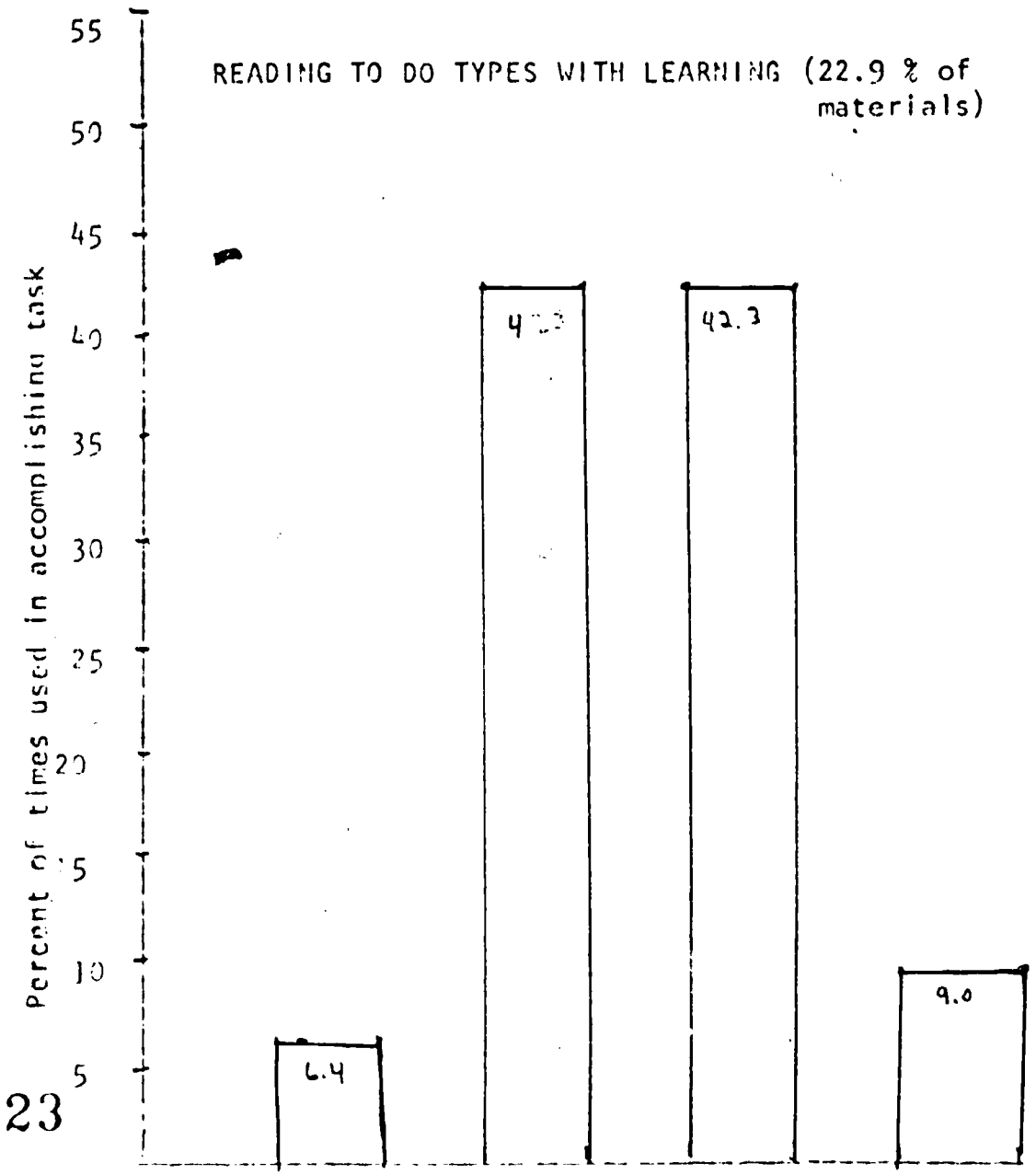


CHART 6

3. STRATEGIES USED WITH JOB MATERIALS

READING TO DO TYPES WITH LEARNING (22.9 % of materials)

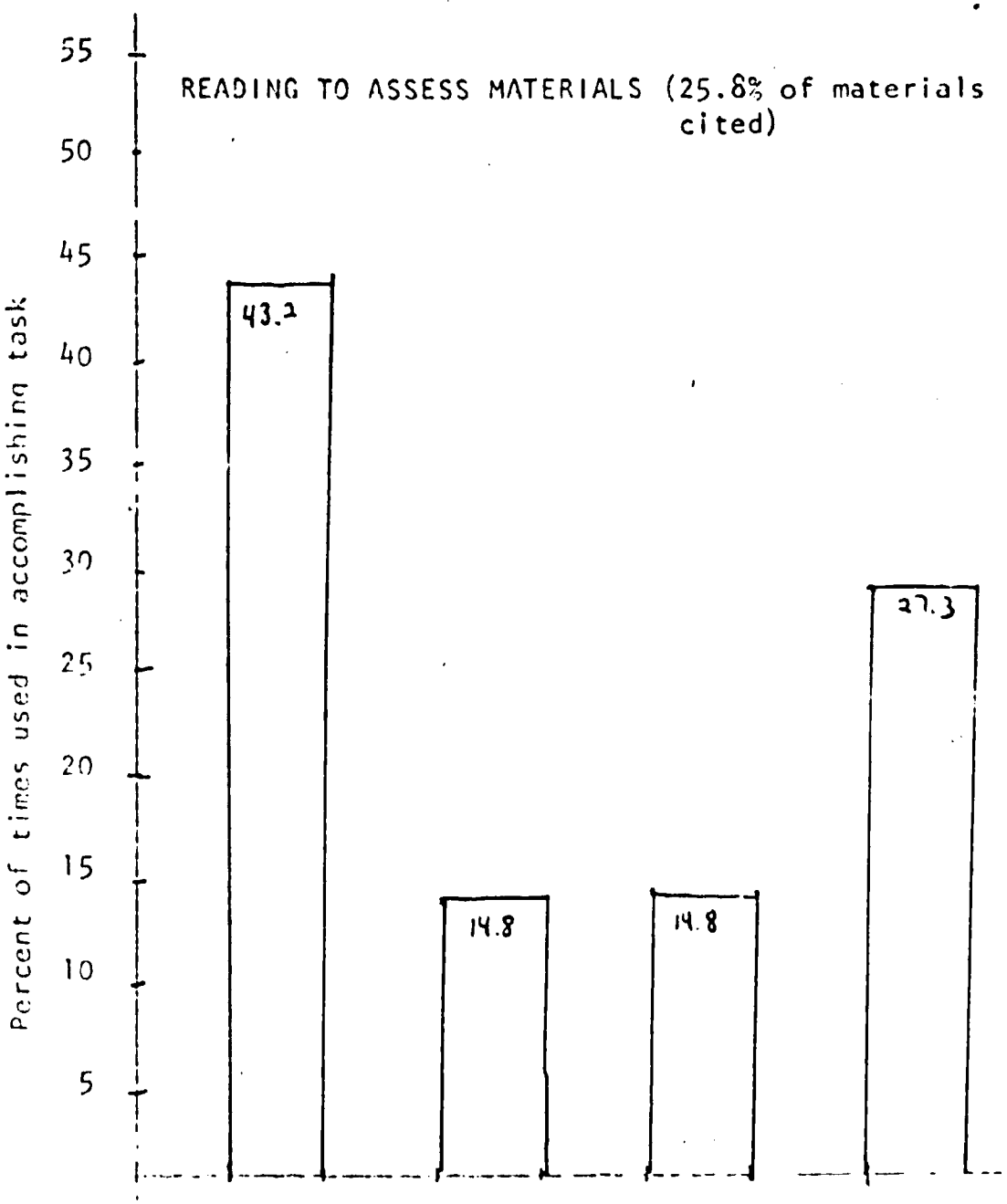


TYPE OF STRATEGY USED

CHART 7

23

READING TO ASSESS MATERIALS (25.8% of materials cited)



TYPE OF STRATEGY USED

CHART 8

24

READING ABILITY ON THE JOB

Cloze tests were administered to subjects in order to determine their general and job reading abilities. The ease of test construction and the objectivity of a cloze, especially when the material is unfamiliar to the test constructor (as most of the job materials were) made cloze the most logical choice for this assessment. A cloze test on a general topic (concerning the desirability of keeping lake water clean) was administered to 99 of the 107 subjects. Where possible, a second cloze was constructed from job materials the interviewee cited as using on the job. Because these cloze tests could only be constructed from textual material, and because of some time constraints, only 35 job-clozes were administered. Raw scores on the general and job clozes were converted to grade equivalencies using Bormuth's (1975) cloze-based readability formula and charts.

On the general cloze, the sample had a mean grade equivalent score of 10.6. The range was from 0 (two subjects unable to complete any items) to 14.0 (the upper limit), and a standard deviation of 2.4 grade levels. On the job-cloze, with only 35 subjects, the mean was 12.3, with a range of 0 (one subject) to 14.0 (12 subjects) and a standard deviation of 2.8. Using only the subjects who completed both the general and job-cloze tests, we found the scores on the two measures to be highly correlated (.438; $p < .015$). Moreover, the scores on the job-cloze were significantly higher than those on the general cloze (t-test significance = .004). Those subjects who completed both job and general clozes clearly read their job materials better than they read a general passage

This was in agreement with our hypothesis that factors other than general reading ability influence functional literacy on a job.

The various attitudinal and behavioral variables were next examined to see which correlated with general and job reading ability and thus could help to explain the significant differences between general and job reading ability. The grade equivalent score on the general cloze was found to be significantly correlated with these factors:

Reading attitude ($r = .285$; $p < .01$)

Amount of time spent reading overall ($r = .287$; $p < .01$)

Scope and depth of literacy demands on the job ($r = .350$; $p < .05$)

Job status ($r = .201$. $p < .05$)

The grade equivalent score on the job cloze, however, was correlated with:

Amount of time reading on the job per day ($r = .368$; $p < .05$)

Job status . ($r = .366$; $p < .05$)

Length of time on the job (Kendall's tau = .288; $p < .05$)

It is interesting to note that job-related factors significantly correlated with job reading ability while more general factors (general reading attitude and amount of time reading overall) were significantly correlated with general reading ability. While two cloze tests can only give a rough indication of reading ability and while 35 subjects is a small sample, these results do seem to indicate that some literacy ability is acquired through experience with specific job materials. This could account for the correlations between length of time on the job and amount of reading on the job and job literacy ability.

While the significantly greater scores on the job-cloze tests are probably due to increased background information that the reader can apply to the text, this difference should not be lightly dismissed. If such a difference does exist (and additional research in this direction could easily be done) two implications would follow. First, if functional literacy is significantly affected by background experience, then assessing functional literacy using "representative tasks" becomes suspect. Individuals may or may not have background knowledge that they can apply to such tasks; on the other hand, individuals probably do have background information--as well as extralinguistic cues--available to them in facing their actual functional literacy tasks. Second, if job reading ability develops with job experience, then using reading tests--even those shown to be closely correlated with actual job demands--for hiring or promotion purposes is also suspect. Recent court cases and laws have specified that any tests given must closely correspond to job demands. If literacy is developed on the job, then it may be inappropriate to use any type of reading measure in making job decisions; the reading measure may indicate an individual's current ability but it may not predict his/her ability to later, given experience, handle the literacy tasks of a job. Additional research in this area might prove most beneficial both to employers and to those closed out of some jobs because of literacy skills.

In addition to examining the correlations among a number of variables and scores on general and job cloze tests, variables correlated with the difficulty of job materials were also examined. The readability of job materials was not correlated significantly to any of the expected variables; readability did not

correlate with schooling completed, amount of time reading on the job, scope and depth of literacy demands on the job, number of strategies used on job materials, general reading ability or job reading ability. Readability of job materials did correlate with the status of the job ($r = .359$; $p < .01$) and income ($r = .286$; $p < .05$). These initial analyses seem to indicate that while levels of literacy demands are significantly correlated with levels of occupation (in terms of status and income), levels of literacy competency and years of schooling completed are not. Although higher-level occupations have more difficult material, it would appear that the better readers are not always in those occupations.

Preliminary correlational analysis of the relationship of various literacy related variables to indicators of job success revealed some potentially interesting results. Three indicators of job success have thus far been constructed. They are:

Income: Actual yearly income figures were collected from all subjects. This data was then transformed to a normal distribution.

Job Status: A job status rank (based on rankings developed by Hodge, Siegel and Rozzi, 1966) was given to each subject. This rank--from 1 to 100--was based on extensive research by Hodge et. al.

Job Competence: Job competence is a composite variable composed of assessments made by: 1) subjects, 2) survey interviews after a two-hour interview, and 3) length of time on the particular job.

Several literacy related variables were correlated with the above indicators of job success. These variables are:

Reading Attitude (as measured by the Mikulecky Behavioral Reading Attitude Measure; this measure has been normed, validated and shown to be reliable in determining attitudinal and behavioral dispositions towards reading in general; Mikulecky, 1976).

Job Interest (as measured by self-report items based on work done in a 1973 HEW survey of worker attitudes towards jobs).

General Reading Ability (grade equivalency scores on the general cloze test).

General Reading Time (self-reported amount of time spent reading per day for any purpose).

Job Reading Ability (grade equivalency score on job-cloze test).

Job Reading Time (self-reported amount of time spent reading on the job per day).

Scope of Literacy Demands (as measured by a check sheet of possible reading and writing activities at work; checksheet is an expanded version of one developed by Smith (1973) to ascertain the literacy tasks in more than two dozen career fields).

Depth of Literacy Demands (as measured by the number of different types of literacy tasks in a job; scope is an indication of books, charts, forms, blueprints, etc. used; depth is an indication of the varied uses to which literacy is applied--e.g. ascertaining facts, comparing two or more sources, making value judgments, etc.).

Number of Strategies Employed (a count of the number of different strategies--reading to learn through associating; reading-to-do by following directions, etc. --that a worker cites as doing on the job.)

Difficulty of Material (as measured by the FORCAST readability measure). Results of the Pearson-Product Moment Correlation Analysis can be found in Table 10.

LITERACY IN RELATION TO JOB SUCCESS

It is interesting to note that there are very few significant correlations between indicators of job success and variables that describe the subject(or reader). The amount of time expended by subjects either general or in job related reading demonstrates no significant correlation with income, status, or competence. General reading ability demonstrates no significant correlation with income, or job competence, and only a slight relationship ($r = .20$) with job status. Job interest demonstrates no significant relationships, and reading attitude only a slight positive relationship with income ($r = .17$) and job status ($r = .25$). Characteristics of the individual's job interests, reading habits, and reading attitudes do not demonstrate a clear connection with traditional indicators of job success.

Significantly higher correlations exist, however, between the literacy demands of jobs and the traditional indicators of job success. For example the variable assessing the scope on variety of types of material faced on the job correlates quite highly with income ($r = .45$), job status ($r = .52$) and with job competence ($r = .25$). Similar patterns exist for the variables measuring the depth to which materials must be read, the difficulty of materials, and the

TABLE 10

Correlations Between Job Success Variables and Job Literacy Variables

	Income	Job Status	Job Competence
Reading Attitude	.175* (N=93)	.253* (N=104)	-.093 (N=97)
Job Interest	.069 (N=96)	.013 (N=104)	-.062 (N=97)
General Reading Ability	.107 (N=92)	.201* (N=100)	.021 (N=93)
General Reading Time	.107 (N=99)	.162 (N=107)	.091 (N=100)
Job Reading Ability	.327* (N=28)	.369* (N=30)	.042 (N=28)
Job Reading Time	.161 (N=99)	.156 (N=107)	.104 (N=100)
Scope of Literacy Demands	.449** (N=97)	.528** (N=105)	.248** (N=99)
Depth of Literacy Demands	.387** (N=98)	.585** (N=106)	.179* (N=99)
Number of Strategies Employed	.260** (N=98)	.295** (N=106)	.238** (N=99)
Difficulty of Material	.286* (N=54)	.359** (N=57)	.026 (N=54)
Job Ability	.382** (N=92)	.298** (N=100)	--- ---
Job Status	.613** (N=99)	--- ---	.298** (N=100)
Income	--- ---	.613** (N=99)	.382** (N=92)

* p < .05
** p < .01

number of strategies employed. It is interesting to note that lower, non-significant relationships again result when literacy variables are correlated with job competency, the only indicator of job success that is based upon the individual subject and not the job itself.

DIFFERENCES BETWEEN COMPETENT AND NON-COMPETENT READERS

Another means was used to examine the significance of job reading competence. If job reading competence was of some importance, presumably significant differences could be demonstrated on several variables when scores of competent readers were compared to non-competent readers. In order to test this assumption, two groups of subjects were selected from the sample population. Group 1 (N=16), non-competent job readers, was determined by selecting those subjects whose reading ability (as measured by general cloze) was lower than the readability level of their job materials. Group 2 (N=36), competent job readers was determined by selecting subjects whose general reading ability was higher than the difficulty of their job materials. The sample was limited to subjects whose job reading materials could be assessed for difficulty using the readability formulas.

T-test comparisons between these two groups were made on the three indicators of job success (income, job status, and job competence). No significant differences emerged. The competent readers scored slightly higher on income and job status but the non-competent job readers actually scored slightly higher on job competence indicators. This may be due to the problems associated with self-report data.

Variables relating to reading habit and ability were also examined since a non-competent job reader could be a capable reader faced with overwhelming reading demands. No significant differences were found for the variables of general reading time, job reading time, scope of literacy demands, depth of literacy demands, or job reading ability. It should be noted, however, that the competent job reading group scored more highly on each of these variables, but not to the point of statistical significance. Competent job readers reported slightly over 4 hours of total daily reading time while non-competent job readers reported slightly under 3 hours of total daily reading time. Large standard deviations were present for nearly all variables. Subject scores on three attitudinal variables (job interest, reading attitude, and intensity of reading motivation) were examined. No significance was found for the variables of job interest and intensity of reading motivation though the same pattern of higher mean scores for competent job readers prevailed. Statistical significance ($p < .01$) was found for the variable of reading attitude with the competent job readers demonstrating a mean score of 73 to the non-competent job readers mean of 60.7. This attitudinal difference could be explained by the fact that non-competent job readers were daily faced with reading tasks beyond their abilities.

SUMMARY AND TENTATIVE CONCLUSIONS

Results from the studies conducted here at Indiana University allows us to make some observations and conjectures, and a few somewhat tentative conclusions about job literacy. A tentative pattern does suggest itself when one

reviews results culled from the Mikulecky, Shanklin and Caverly (1979) study and the newer data being analyzed by Mikulecky and Diehl.

There are, for example, indications that:

1. When pressed, nearly everyone (99%) admits to some form of functional literacy job demands.
2. The majority of adults (89%) are comfortable with their job reading demands.
3. Women who are employed tend to spend more time than men who are employed in doing job related reading. Men, however, go to books and manuals to "get something done" for the job.
4. The demographic variables of income and race are not good indicators of the amount of job reading and education demonstrates only slight significance.
5. The main sort of job reading is done to accomplish a task and is repeated often.
6. Most job materials are viewed as important, but not vital, to completing job tasks; a substantial minority of materials (23%) were felt to be vital.
7. Though textual material is most often read, graphic material is considered more vital to completing job tasks.
8. Workers are significantly more competent at their job reading than general reading; job experience seems to play an important role in this difference.

9. Very few reading habits or attitudes (on or off the job) significantly correlate with traditional indicators of job success (income, status, competence), though indicators of reading demand difficulty were found to be strongly correlated with job income and status but not job competence.

10. Comparisons between competent and non-competent job readers revealed few significant differences though there was a tendency for competent job readers to score slightly higher on measures of job success, reading habit, and reading demand.

This pattern of findings suggests to these authors that: 1) there exists a good deal more job-realted reading than was previously suspected; 2) the vast majority of workers are comfortable with their job reading demands; and 3) they are indeed more competent with those demands than with general reading demands.

Job competence demonstrated extremely low correlations with any literacy indicator. Measures of worker reading habit and ability also correlated to a low degree with job income and status. Only measures of job literacy demands, not competence, correlated highly with job income or status. This pattern suggests the speculation that higher paid, higher status jobs are associated with increased literacy demands but that the actual successful performance of those jobs may be less clearly associated with literacy competence and habit.

When subject job reading competence with actual job reading materials was analyzed, few differences could be found between competent and non-competent job readers. These results are based on a very small sample

which contains mainly middle and upper level jobs, but the pattern of results seems consistent with the other findings previously reported. Job literacy ability makes some difference, but not really very much. Other factors must be accounting for a great deal of job success. Such factors may be important generally and should be considered in assessments of functional literacy.

The only clear relationship between job success and literacy had to do with the literacy demands associated with the job and not the literacy performance of the workers. This suggests that, to a certain extent, literacy may be playing a symbolic role in distinguishing high status, high income occupations from lower status, lower income occupations.

This symbolic role of literacy may, indeed, be a confounding factor in many of our assessments,of and programs to develop, functional literacy. It may cause some job opportunities to be closed to individuals who, in actual fact, could handle the literacy demands. (The symbolic aspects of literacy are discussed in detail by Olson, 1975, Fudge, 1973,and Diehl, 1979.)

Given the preliminary nature of the data analysis and the small sample involved, these concluding statements must be viewed as informal speculations rather than solid conclusions. The consistent pattern of research results does suggest, however, that more extensive work in this area is definitely in order.

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