

First Findings on
O*NET Adequacy and Appropriateness
For SSA's Disability Decisionmaking Process

by:

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First Findings on O*NET

This working paper is intended to communicate the first findings of the analysis of O*NET, relating to its construction and its potential usefulness for disability decisionmaking. This preliminary investigation was undertaken to assess the adequacy and appropriateness of O*NET for use in SSA's decisionmaking process, not to determine ways in which O*NET may be used. SSA identified a number of issues related to the construction of O*NET and communicated these to the O*NET consortium in our review of the OMB clearance package.¹ The issues cited in SSA's review of the OMB clearance package, concerns expressed by IOM in its second report, and other identified issues were the genesis of this preliminary assessment on O*NET.

This paper is intended to summarize preliminary findings, present concerns, and recommend further research evaluating O*NET for SSA's potential use in disability decisionmaking. The present findings are inconclusive, but do point to potential problems in the construction of O*NET that may hamper the direct use of O*NET's measures in the disability decisionmaking process, or may require significant modifications or supplementation prior to SSA's adoption. Additional work must be done to validate O*NET for SSA's use in disability decisionmaking prior to developing methods to utilize O*NET.

The O*NET Taxonomy

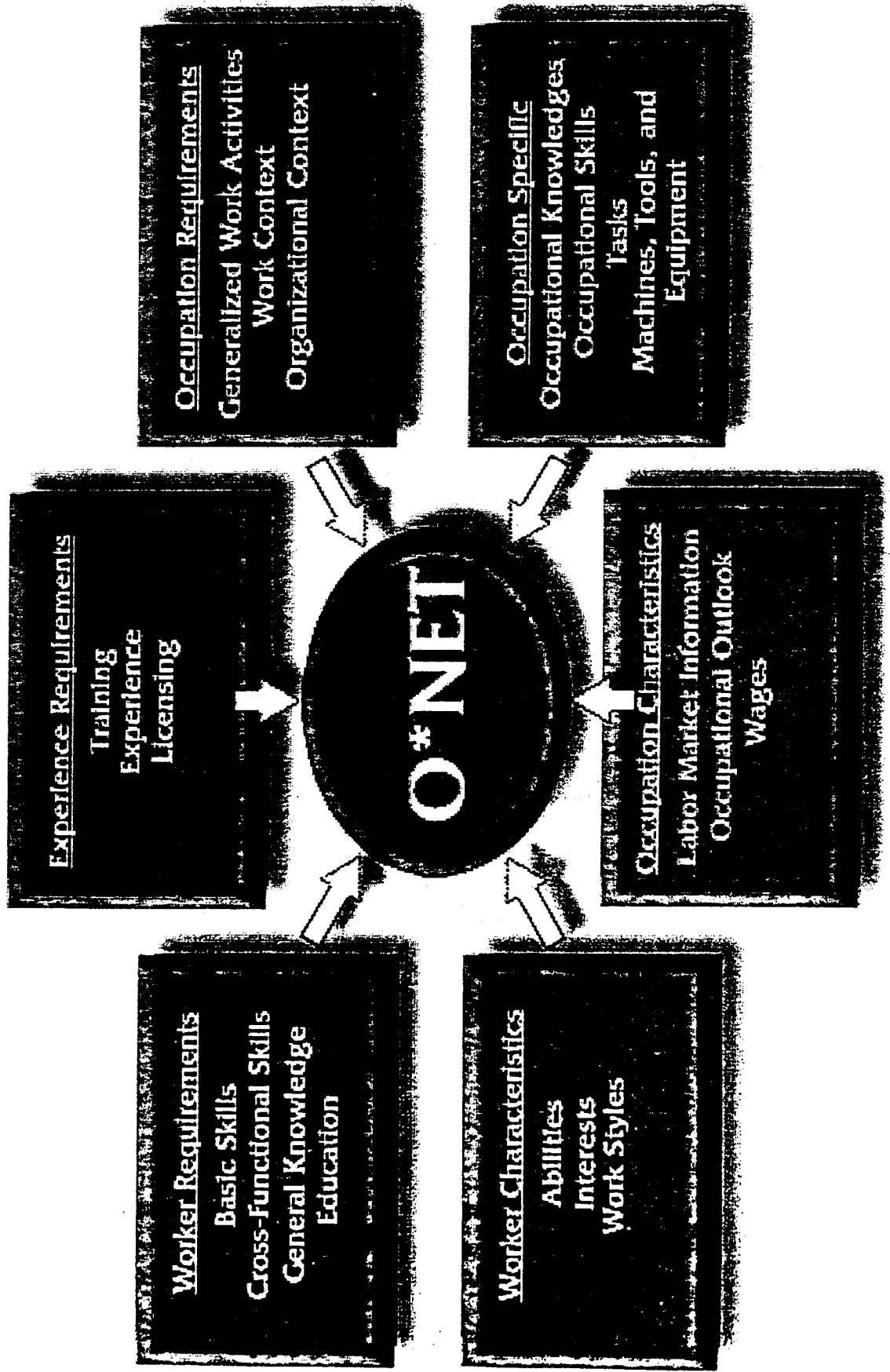
The purpose of a taxonomy is to provide a system by which to categorize a perhaps infinite range of characteristics into a limited series of individual, discrete items for the purpose of conceptualization and/or classification. The O*NET taxonomy is, in a sense, a dual taxonomy. O*NET clearly creates a classification of the requirements of jobs according to several (6) domains (worker, experience and occupation requirements; worker and occupation characteristics; occupation specific). This is shown in the O*NET content model in the diagram below.

However, O*NET also creates, in a sense, a taxonomy of jobs or occupations by which the full range of jobs are reduced to categories, or discrete units, known as "occupational units" which are, in fact job, or occupational, clusters.² In

¹A copy of SSA's comments appear in Appendix A to this working paper.

² Appendix C contains a glossary from the DOT containing definitions of terms relating to the categorization of work into tasks, positions, jobs, and occupations. The DOT was developed on the occupational level, O*NET is being developed at a higher level of aggregation: occupational units or groupings.

O*NET Content Model



consideration of the availability of labor market data in OES system, it was decided "the OES provided the most feasible taxonomy for this purpose."³ The OES taxonomy, however, was not without its problems and the OES taxonomy (occupational clusters) was modified somewhat, increasing the number of units to 1122 from 852. The increase in occupational units from the OES to O*NET was the result of the belief that the OES occupations were too broad and lacked the "belongingness" and "homogeneity" desired for the O*NET OUs. The basis for decisions on moving from OES clusters to O*NET OUs was based upon a crosswalk using selected data from the DOT on its 12,000 jobs. The variables used in the DOT to O*NET crosswalk are shown in table 1.⁴ The basis for creation of the O*NET OUs did not include, or even consider, the DOT variables most often employed by SSA, including the strength rating and specific vocational preparation.

Thus O*NET is a two way taxonomic table of O*NET descriptors arranged by content model domains, crossed by the taxonomic clusters of occupations. Each of the domains will have subcolumns for the various O*NET variables, and will eventually contain an array of data points provided by incumbents from which average values will be computed and entered into the database.

	O*NET Domains					
	Requirements			Characteristics		Occ Spec
	Exper	Wrker	Occ	Wrker	Occ	
OU 1						
OU 2						
OU 3						
OU 4						
...						
OU1122						

Thus there are 3 areas requiring analysis and validation: (1) the O*NET content model, (2) the occupational units, and (3) the actual data incorporated in the O*NET data base (considering both the data collection process and the data base and measures). If

³Appendix D "The development of the Occupational Information (O*NET) Analyst database." page D-3

⁴This is based upon appendix D. A different series of variables was cited as the crosswalk in the January 1996 paper by John Nottingham and Jane Golec entitled "Prototype development of the O*NET: The Occupational Information Network." They cite the following DOT variables: Worker Function, Aptitude, GED, and SVP ratings.

any one of these three areas prove deficient for SSA's purposes, O*NET may not be adequate for SSA's use. Additional work will be required to either modify O*NET or to identify or develop an alternative to O*NET.

Concerns and Preliminary Findings Related the O*NET Taxonomy:

There are a number of concerns with respect to the taxonomic structure. These are stated below, followed by a description of the preliminary findings.

*Concern 1: Is the O*NET content model adequate for the purpose of disability decisionmaking? Does it properly represent the requirements of jobs, and, particularly, does it adequately represent the requirements of jobs for impaired persons, or does it presume some basic abilities?*

Preliminary Finding: Beyond the fact that there are many O*NET variables and some variable reduction will be required, no research has yet been undertaken to validate for disability decisionmaking either the O*NET content model or the O*NET data for the O*NET variables. The O*NET content model is quite different from the DOT model, both in the number and complexity of the variables representing the requirements of work. The two are quite different in the approach to the physical requirements of work, with the O*NET containing more variables, some of which mix several DOT concepts or measures within a single O*NET variable. (For example, static strength in O*NET combines the abilities to push, pull, lift, and carry items in one heirarchical measure, i.e., lifting is more difficult than pulling, which is more difficult than pushing.) O*NET has two scales, level and importance while the DOT is base upon level and frequency.

In general O*NET measures appear to represent more complex, or more specific tasks when compared to the DOT basic tasks. Strength (weight/force in DOT terminology) in O*NET is measured by at least 5 variables (static, explosive, dynamic, and trunk strengths and stamina), while the DOT has a single composite measure that subsumed not only weight and force (lifting, carrying, pushing and pulling), but body position (walking, standing, and sitting) and body extremity controls (use of arms, hands, legs and feet) also. O*NET has separate measures for body position (e.g., body positioning, extent flexibility, dynamic flexibility) and extremity controls (e.g., manual dexterity control precision, multilimb coordination, gross body coordination, etc.). The O*NET content model may have sufficient information to derive a composite measure comparable to the DOT strength measure, but only if the OU taxonomy and data collection are adequate and some relationship may be established between "frequency" of an activity and "importance" of activity.

While O*NET contains more information than the DOT in the non-exertional area, e.g., cognitive requirements, experts have

raised concern with respect to the adequacy of O*NET in this area. If SSA decides that O*NET is adequate and appropriate for use in its disability decisionmaking, significant changes will be required in the way SSA physicians assess RFC (e.g., the RFC form must focus on the new O*NET taxonomy and variables), and all disability decisionmakers will require retraining and retooling to think in O*NET terms, as opposed to the quite different DOT terms. (See Appendix 4 to this paper for a DOT/O*NET crosswalk.)

Considering the issue of the completeness of the O*NET content model, work currently being undertaken by AIR has begun to look at universal requirements of work, many of which are not measured by O*NET. AIR views these as binary variables (have/do not have or can do/cannot do) although these variables may, in fact, represent a continuum that must be measured. Furthermore, beyond an expert judgement exercise linking functional abilities with O*NET variables, no systematic work has been done to identify missing or misspecified/mismeasured constructs. A considerable number of practitioners who use the DOT, including an SSA consultant, have criticized the ability variables in O*NET.

Concern 2: Is the occupational taxonomy (method of clustering) adequate and appropriate for the purpose of disability decisionmaking? Are there too few OUs? Does it cluster jobs without concern for the "homogeneity" and/or "belongingness" of jobs along the requirements most relevant to determining the ability of an impaired person to perform the job?

Preliminary finding: The method of clustering may not be adequate for SSA purposes as the method of clustering DOT jobs was not based upon DOT variables utilized by SSA. Inadequate attention was paid to the heterogeneity DOT jobs along a number of dimensions (including those critical to SSA such as physical requirements and training requirements) and the result is a relatively small number of OUs, with some of the OUs containing hundreds of DOT jobs. (The number of DOT jobs within an OU can exceed 500, and this occurs for a number of OUs containing jobs of interest to SSA.) Based upon an analysis of the DOT variables that SSA generally employs in the disability decision process, our preliminary examination indicates that there is a great degree of heterogeneity of the jobs or occupations clustered within OUs. This is shown in the two graphs that follow. The first graph describes one O*NET OU (All Other Machine Operators and Tenders) according to the two DOT variables (strength and specific vocational preparation) upon which SSA bases the grids. Here the frequency of DOT jobs in the OU are shown by these two key variables. The heterogeneity of jobs is evident for both variables, and clearly low level jobs are subsumed by higher level jobs. Preliminary findings appear to point to an inadequate number of OUs for SSA's purposes and the need to disaggregate or expand O*NET data collection.

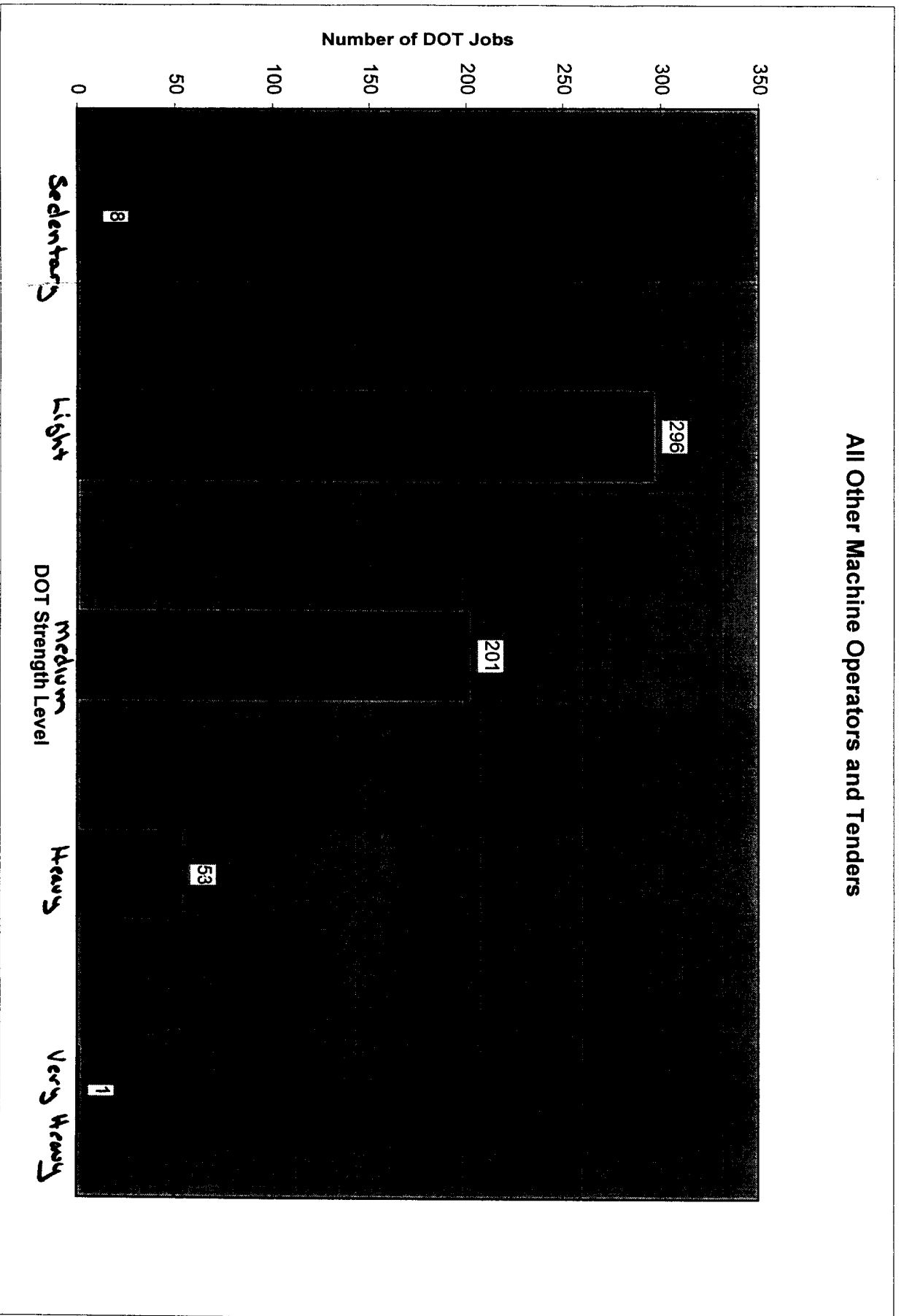
Table 1. Variables Used in Cluster Analysis¹

Variable	DOT Job Component
Reasoning Mathematical Language	General Educational Development (GED)
Specific Vocational Preparation	Specific Vocational Preparation (SVP)
Data People Things	Worker Function
General Learning Ability Verbal Aptitude Numerical Aptitude Spatial Aptitude Form Perception Clerical Perception Motor Coordination Finger Dexterity Manual Dexterity Eye-Hand-Foot Coordination Color Discrimination	Aptitude
Materials, Products, Subject Matter, and Services (3 Codes)	Materials, Products, Subject Matter, And Services
Work Fields	Work Fields
Directing People Influencing Expressing	Temperament

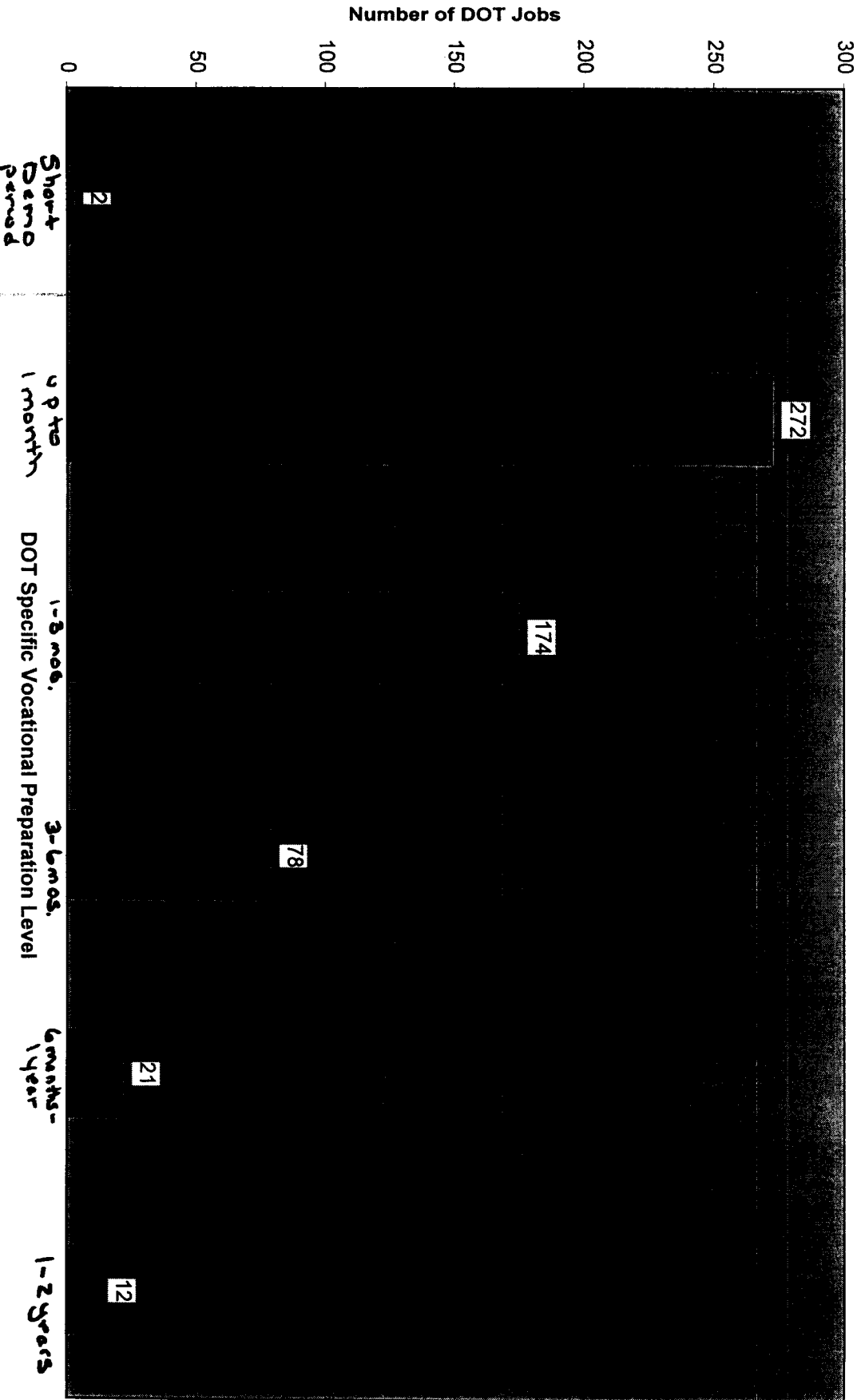
Some variables (i.e., the GED dimensions, the SVP measure, the Worker Functions, and the Aptitudes) were selected because they were most closely related to skills. Others (i.e., the Materials, Products, Subject Matter, and Services [MPSMS] codes, the Work Field codes, and the

1. Scales for each variable are explained in detail in the Occupational Outlook Handbook (DOL, 1990).

All Other Machine Operators and Tenders



All Other Machine Operators and Tenders



Concern 3: Does the small number of clusters, and possible result of large number of jobs within the clusters, and/or a lack of homogeneity of the jobs result in measurement error?

Preliminary findings: The 1122 O*NET OUs do, in fact, result in large numbers of jobs in many clusters, though there are some OUs that represent small numbers (from one to several) of DOT jobs. There is no consistency in the number of jobs clustered. Botterbusch⁵ suggested that even the 2500 OUs used in the Australian system was too small. Perhaps of more concern than the number of clusters and number of jobs in the clusters is the lack of homogeneity that has been found, at least among the clusters that contain the low level (i.e., sedentary-unskilled DOT jobs). This seems to indicate a large potential measurement problem from the creation of the O*NET OUs. Attached at Appendix 2 is the distribution of DOT jobs (over 4000) that fall within the 40 O*NET OUs that contain the 137 low level DOT jobs (i.e., sedentary-unskilled) according to each job's DOT skill rating (specific vocational preparation) and strength rating. The two graphs, discussed above, illustrate this problem. The graphs and the tables in the appendix highlight the lack of homogeneity of some OUs based upon these simple DOT measures, yet show some OUs that are in fact homogeneous (though not sufficiently to directly map into the current vocational grids).

*Concern 4. Is the method of data collection for the O*NET data base adequate? Is the incumbent data collection questionnaire gathering the right information? How do incumbents interpret the questionnaire and how do they characterize their jobs? Is the incumbent sample of 15 questionnaires per OU adequate? What impact does splitting the incumbent questionnaire into 5 distinct parts, with different persons responding to each part, have on the validity, reliability and usefulness of the data?*

Preliminary findings: SSA raised a number of issues with respect to data collection activities for O*NET in comments on the OMB clearance package⁶. A critical issue relates to the instructions provided to incumbents as to how they should rate their job.⁷ The DOT analyst rates each job based upon observations of persons performing the job, using the defined standard of "average for

⁵Karl F Botterbusch, under contract to Utah Dept. of Employment Security, prepared a paper that raised this issue. The paper is entitled "Suggestions for Revisions in the DOT" and was performed under contract 92-465. (see pages 9-13).

⁶SSA comments on the OMB clearance package for O*NET are attached at Appendix 1.

⁷ The incumbent may be able to only rate, in the DOT nomenclature, his/her position, not the job or the occupation as rated by the DOT job analyst.

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successful performance." For O*NET, however, there are no clear instructions as to how the respondent should rate the job and hence what the rating actually represents. Individuals are asked how each O*NET item relates "to your current job." Interpretation of what information the survey seeks may vary from respondent to respondent, with responses reflecting any of the following ratings:

- o what the incumbent is able to do, or brings to the job;
- o the average requirements (abilities, skills, etc.) for the individual survey respondent's own individual position;
- o the minimum level of those categories, for entry into the survey respondent's own position;
- o the average level for all incumbents of that occupation (all jobs in the economy), in the opinion of the survey respondent;
- o the minimum level for all incumbents, for entry into that occupation, in the opinion of the survey respondent; or,
- o some other requirement.

As far as we can discern, there are no specific instructions to the respondent and no cognitive testing was performed to determine the respondents interpretation of the question and the nature of the response. Without a better idea of how the incumbent responds, it will not be clear the extent to which variation in the requirements of an OU relate to heterogeneity of the requirements of jobs in the OU as compared to differences in the question interpretation and response from incumbents.

As mentioned above, in some cases 500 or more DOT jobs were clustered into an OU. These jobs are, based upon ratings in the DOT, diverse (heterogeneous) requirements of work among the variables currently of interest to SSA. The size of the incumbent sample (15) for each OU will not be adequate to determine the range of the various requirements of jobs that were clustered into the OU. A sample size of 15 will preclude SSA from using the O*NET database to identify low level jobs within an OU. In the study of DOT jobs within O*NET, for example, several OUs contained relatively few low level physical jobs (e.g., sedentary) among hundreds or higher level jobs⁸. With a more robust O*NET database, SSA could identify the requirements of the lower level jobs within the larger OU.

Identifying and utilizing the lower level jobs within an OU would require not only a larger statistical sample, but also a database of individual level data to permit SSA to evaluate jobs with respect to all critical requirements of work. In order to reduce burden on individual respondents, DOL has proposed having 5 separate questionnaires, each obtaining data on a single O*NET domain with no overlapping questions across questionnaires. While this will not affect the current O*NET database, which

⁸See the tables attached to this report that illustrate the diversity among OUs that contain SSA's 137 sedentary, unskilled jobs.

reports only average values, it creates problems in using the micro-level database. SSA will not be able to ascertain the complete picture of low level jobs, as there will be no complete data on any one job. If SSA seeks to identify, for example, low skilled and low physical jobs within an OU, it will not be possible to do so. Skills were provided by one group of respondents, and abilities by another group. Thus low physical may be high skilled or vice versa; SSA would have no way of verifying this. Similarly, body positioning could not be directly related to strength requirements.

It would appear that data collection, as currently proposed, creates a number of problems which must be resolved before SSA may attempt to address potential problems relating to the aggregation of jobs into OUs.

*Concern 5. Is the analyst data base appropriate for use in developing the redesign disability decision process, or even for making decisions about the appropriateness of O*NET?*

Preliminary findings: The O*NET data base, as provided in the O*NET '98 version released by the Department of Labor, contains only the analyst database. While there have been claims of "high reliability" between the analyst data and the incumbent data in the 41 occupations for which incumbent data was collected in the pilot test. This reliability, however, exists only in the average across different O*NET variables. The reliability of individual assessment (across raters and incumbents) within an O*NET variable has not been examined. Therefore, the greatest source of variation that might cause problems in reliability has been disregarded, or averaged out. Of greatest concern is that this approach to assessing reliability will minimize the effect caused by the aggregation of heterogeneous jobs into the OUs, a problem that cannot be detected in the analyst database.

The analyst database was constructed based upon analyst⁹ review of O*NET occupational specific tasks followed by a judgement of the level and importance scales for each O*NET variable, without having any analyst actually observe persons performing the jobs. (The O*NET task descriptors were derived from a compilation/synthesis of common task element statements for DOT jobs which were included in the OU.) Though the DOT task statements were the source of the O*NET task descriptions, the information in the DOT was not utilized in making O*NET ratings. This leads to questions with respect to the validity of the O*NET ratings in the analyst database.

⁹Analysts were industrial organization psychologist graduate students.

The incumbent database has been completed for only 41 of the 1122 O*NET occupational units¹⁰. The O*NET pilot study, about to be undertaken by the O*NET consortium, will add incumbent data to 150 (?) OUs. Comparisons of the incumbent and analyst databases, among the current 41 OUs containing both sources of data, is critical to determine whether the analyst data is sufficient to use in assessing O*NET as a replacement for the DOT or developing a method of using O*NET in the decision process.

Possible Methods to Adopt O*NET for SSA's Use:

It is too early in the review of O*NET to make any decisions as to whether O*NET can or cannot be adopted to meet SSA's needs: insufficient work has been done in assessing O*NET. There are clear indications of O*NET inadequacies that must be addressed, and this section describes possible solutions.

1. O*NET Content Model: As discussed above, little work has been done to assess the O*NET content model for disability decisionmaking. Specification of the "baseline of work" must be the first step to assessing the content model for use by SSA. Insufficient work has been done on the content model to make any recommendations as to whether, or how, this aspect of O*NET fits SSA's needs. However, it would appear that, at a minimum, careful review of the O*NET content model must be undertaken with an eye towards variable reduction. To develop a viable decision process, a manageable array of disability related variables must be identified and linked to assessing residual functional capacity. Utilizing the structure of the DOT strength measure to develop a composite O*NET measure might be a first step in looking at the content model.

2. Occupational Units: There appears to be significant limitations in this area of O*NET, due to the aggregation of many and varying jobs into the OUs. There are two potential solutions to the OU problems:

- o utilize the distributional information from the incumbent database to find the requirements of the lower range of jobs (or minimal requirements) within an OU, or
- o disaggregate O*NET OUs by identifying specific jobs of interest to SSA (e.g., identify those with lower requirements) and collecting O*NET data on these selected jobs, as well as the larger OUs.

Both solutions would require modifications to the DOL's proposed O*NET data collection plan.

¹⁰The data collected for these 41 occupations may suffer from data collection problems (such as non-random, nonrepresentative sampling and extremely low response rates) that may raise issues of validity of the actual data.

3. O*NET Data collection: Based upon the concerns expressed with respect to the specification of the O*NET OUs, it would appear that modifications must be made to the O*NET data collection plan. If one were to use the distributional approach, discussed above, two modifications must be made to O*NET data collection. First, the incumbent questionnaire cannot be divided across 5 domains for separate respondents, but each respondent must complete the entire O*NET content model, or at least all O*NET items utilized in SSA's disability decision process. Second, the sample size of completed O*NET questionnaires must be significantly increased to provide enough information to cover the number and range of jobs within the OU.¹¹ It is difficult to propose a disaggregation approach without more evaluation of the O*NET OUs, however the approach would require identifying specific jobs of interest within the OU, sampling those jobs, and collecting specific data for each job. The disaggregation approach will not be unlike creating SSA's own system, with the exception that it would follow the O*NET content model (or extracted portions thereof) and piggyback off O*NET data collection operations.

¹¹In small OUs containing only a single job, the sample of 15 may be adequate. However, for OUs that contain 500 or more diverse jobs, a much larger sample size will be required. The actual size will depend upon a number of factors, but is likely to require thousands, rather than dozens, of respondents.

Future Research:

There are a number of research questions that remain to be answered, or more fully answered, with respect to O*NET's potential for use in disability decisionmaking. These include:

What are the requirements of work that relate to disability decisionmaking? Does O*NET contain the right domains and are all necessary variables measured?

Does O*NET provide all measures on a scale that is relevant to disability decisionmaking?

Does O*NET presuppose some basic level of ability or performance, that is, that any individual must bring something to a job (for example, can ambulate, or is not in a wheelchair, etc.)? Note: these may or may not be the "universal requirement of work" currently under consideration.

What is the impact of aggregating jobs (based upon DOT or other conceptual basis) into O*NET occupational units (clusters)? Is the specificity of jobs and sensitivity of measures lost in exchange for more variables? Does O*NET result in OUs that are so heterogeneous that O*NET is insufficient to even identify low level jobs, no less provide direct measurement of the requirements of jobs?

Are O*NET measures created so that they may be used directly, either based upon the average value, or utilizing the raw data in the O*NET database to get some minimal level? (That is, can the level be directly translated to functional measures, and if so, what testing must be performed to accomplish the crosswalk, either directly or indirectly?)

Next Steps in Research:

The critical first step is to identify the requirements of work as they relate to disability decisionmaking, without relying on the O*NET content model as the basis. This work must be done not only to determine the appropriateness of O*NET, but also to assist in the selection of functional assessment instrumentation. Utilizing the DOT strength measure, and its component constructs might be a starting point.

Additional work on O*NET that evaluates the heterogeneity of jobs in OUs and analyzes the analyst database should be undertaken using the 41 occupations for which both sources of data (analyst and incumbent) exist. Examining the range of values in the incumbent data base is a start to assessing the heterogeneity of job requirements within an OU. It will be difficult to discern sampling and reporting errors from heterogeneity, however by comparing OUs are composed of small numbers of homogeneous DOT

jobs to OUs with larger numbers of heterogeneous DOT jobs it may be possible to obtain some idea of heterogeneity vs. reporting and sampling errors.

Utilizing links between O*NET and the DOT, preliminary work can be performed looking at the relationship between O*NET variables and DOT variables. Similarly, work can begin to examine the relationship between O*NET scales and DOT scales (i.e., values for the variables). This work would rely upon the identification and utilization of OUs that appear to be homogeneous based upon the DOT jobs that were clustered to form the OU. A major issue, however, remains in the lack of a full incumbent database, and the representativeness of the analyst data base, for doing this type of analysis.

Conclusions:

Preliminary examination of the construction of O*NET raise serious questions with respect to the validity of the data for use in SSA's disability decisionmaking process. The O*NET content model, if appropriate for disability decisionmaking, will require major changes in the way SSA assesses residual functional capacity. The heterogeneity of jobs clustered into OUs suggest that if the data were used as provided by O*NET '98, the aggregation bias (in terms of measuring the requirements of jobs) could be so great that a significant increase in allowance rates could occur if the measures are utilized directly. The method of data collection, as well as the size of the sample, are impediments to SSA determining the requirements of work for lower level jobs, exacerbating problems caused by heterogeneity.

SSA must continue research into the adequacy and appropriateness of O*NET for its purposes. This work would best be undertaken by an impartial research group, one that is open to identifying shortcomings in O*NET and formulating modifications or alternatives to use of O*NET in the decisionmaking process. Such research is critical and must be undertaken in a timely fashion due to the impending obsolescence of the DOT.

Comments on O*NET OMB Clearance Package

SSA is very supportive of fielding the O*NET data collection as soon as possible because we recognize the critical need for updated occupational demand information for multiple users, including our use of such information in the disability determination process. The Consortium should be proud that it has reached the milestone of OMB clearance for the survey methods and instruments it will use to build the incumbent data base.

Our comments below are in the spirit of improving the data collection effort, recognizing the competing pressures the Consortium is under in terms of respondent burden, data validity and reliability, and need to begin data collection as expeditiously as possible.

INFORMATION ON LIMITATIONS

We are very encouraged that you have chosen to include the questions from the Year 2000 census in this area. On page A-54, the clearance package indicates rightly that the question on disability status is sensitive. This question will, however, be very informative for SSA and others who will use the O*NET data in disability-related contexts, such as disability decisionmaking or vocational rehabilitation. Unfortunately, the small sample size of incumbents to be surveyed may limit the usefulness of this information. However, we expect that SSA will find the information valuable as it updates its disability decision process, including adopting O*NET as a replacement for the DOT.

While we recognize the necessity of not having the answers to such questions being personally identifiable and ensuring confidentiality to respondents (A-54), we hope that the data collected will remain linked to the individual's characteristics in the database and that SSA will have access to the raw data.

UNIQUE REQUIREMENTS FOR DATA COLLECTION FROM INCUMBENTS

Where DOT relied upon trained raters, the O*NET data will rely upon direct reporting by incumbents for the first time. Such data collection techniques make the presence of specific instructions to respondents critical. Currently the instructions ask for "valuable information about your work." It is not clear which individual response is being collected: the level the individual believes that they bring to the job, the level the job generally requires, and if rating the job requirement--the average or minimum level that is sought? DOT specified the level as "the level required for average successful performance." If the intent is to collect information comparable to that of the DOT, the instructions must be more specific as to how the rater should rate; for example with reference to abilities, if the intent is that same of that of the DOT, the incumbent should be

told that the abilities he/she is rating are: "those abilities...required of a worker in order to achieve average successful job performance..." for his/her occupation. If the intent is not to look at average successful performance, then that needs to be specified (for example, the level necessary for minimum performance).

Thus, it is not apparent precisely what the data reported in O*NET actually represent. There are no clear instructions as to how the respondent should rate the job. For example, should the survey respondent provide:

- o the average requirements (abilities, skills, etc.) for the individual survey respondent's own individual position;
- o the minimum level of those categories, for entry into the survey respondent's own position;
- o the average level for all incumbents of that occupation (all jobs in the economy) in the opinion of the survey respondent;
- o the minimum level for all incumbents, for entry into that occupation, in the opinion of the survey respondent; or,
- o some other requirement.

This difference may be crucial to SSA since, by statute, SSA must consider an individual's ability to do a job, *regardless of whether the individual would be hired to do that job*. To the extent that incumbent respondents may bring, and report, skills and abilities that are not necessary for the occupation, this may make SSA's use of O*NET data problematic.

Even with clarified instructions to respondents, for a further check of the validity of responses, we would suggest that you consider using other raters as a check, at least as part of the pretest. If utilizing DOT-type raters is not possible, has consideration been given to the possibility of having the employer's human resources person or an immediate supervisor also rate the job for comparison purposes? Validity and inter-rater reliability will be important to virtually all users of the data. For SSA, using O*NET for disability decisionmaking may prove very difficult if reliable, valid measures of abilities and other job factors are not provided or if it is unclear what level of performance is being reported and that this level pertains to the occupational demand, not the individual's unique education and skills base (which, for example, could be much higher than what the job demands).

SCALES/ANCHORS

In the clearance package you have deleted the anchors used in the original O*NET analyst database and the preliminary incumbent data collection. Because the descriptors placed at various points on the scale often combine a number of abilities/skills etc. in identifying the level, it is not clear that the respondent will understand the dimension or variable about which

information is required. We believe that you should test the instrument with and without the anchors during the pretest. In addition, we believe that a further emphasis on the definition of the variable in the instructions could also clarify the dimension you want rated.

The scales used in O*NET, and the placement of descriptors on the scales, on their face appear to be better suited to discriminate among the "high end" job requirements or occupations, for example among occupations where high levels of skills or abilities are required. The current scales may be too high to discern among the demands of the unskilled, low level of ability jobs that are generally the basis for SSA's disability decisions which consider vocational factors (i.e., age, education and prior work experience). This may prove problematic in using O*NET as a tool to assist SSA in disability decisionmaking, but if true it could also be problematic to other users such as vocational and rehabilitation counselors.

According to the clearance package, a change has been made in the method of reporting importance and level scales for abilities, as well as some other categories. Instead of collecting information on level first, and importance second, the order was reversed. The lowest anchor on the importance scale was also changed from "not relevant to the job" to "not important." In the current O*NET data collection approach, level of required ability is not collected if the ability is "not important." While the old system may seem unreasonable because individuals were asked to first establish a level of performance for items that might eventually be reported as "not relevant" to the job, under the current approach there is no information about the level if the job requirement is not important. It concerns us, from the disability decisionmaking perspective, that the level of ability will not be specified for abilities that are viewed as "not important." It is possible that, even though the ability is not important, it may require even a modest level of performance that a disabled individual would not be able to meet. In such cases, SSA could erroneously determine that individuals could do a particular job and deny the claim, when in fact the individual could not meet the level of ability required, even though it was not particularly important to the job.

SAMPLING METHODOLOGY

On page A-45, it is stated that the employer sample will be taken from firms of 5 or more employees. There are two concerns here: the survey coverage issue and the issue of the representativeness of the data. In fact, according to the table on page B-13, excluding small employers (fewer than 5 employees) eliminates 60 percent of all businesses. In addition to dropping small employers, O*NET also eliminates all self-employed individuals, including temporary employees, consultants, etc., creating a

small, but growing, class of individuals who are not represented. We are concerned that certain occupations may exist only in small firms, or are predominant in small firms, raising issues of bias, if not lack of coverage. Furthermore, we are concerned that the way some jobs are performed for larger employers may be quite different from the way they are performed in smaller firms, again raising issues of the representativeness of the data. For example, low skilled jobs currently play a great role in SSA's decisionmaking process and, to the extent that lower skilled jobs are represented in small employers, lack of small employer data is problematic. In addition, information about smaller employers and self-employed individuals could also be critical to SSA if these were common modes of employment for people with disabilities, regardless of the skill level required.

O*NET may not cover all occupations: newer occupations (including combinations of previously existing jobs) will be missed. By the selection of businesses to be surveyed from "standard business directories, the O*NET approach could result in an overly conservative bias based on business activity as represented by a standard business directory.

Nevertheless, we do appreciate the problem of scientifically sampling smaller firms and self-employed or temporary workers.

CROSS-DOMAIN VARIATION

O*NET data collection will be conducted by surveys of job incumbents. Due to the large amount of data to be collected, and thus the length of the questionnaire, the questionnaire will be split into the 5 individual O*NET content areas and respondents will complete only one section of the O*NET data, along with a short list of questions about respondent characteristics and job tasks (page 126). We would suggest that a small number of important questions from each content area be asked of all respondents. This would add only a slight burden, while providing very important information about the reliability of responses, the level of variation, and the possible contextual impact of asking the content areas individually. We believe that this should be done in the pretest and in early data collection activities. If it is found that there is little or no impact on responses and the resulting estimates of reliability, variation, and contextual differences such redundancy could be reevaluated in later collection phases.

CRITICAL NEED FOR QUALITY CONTROL/ASSURANCE SYSTEMS

We believe that it is essential that you provide for an ongoing system of quality control/assurance in your research design. Several of the specific suggestions for the pretest stage that we make elsewhere in these comments could be incorporated into such a system. For example, a given percentage of responses could be verified by repeat data gathering by a trained job analyst on an ongoing basis. Such a system could also discourage fraudulent

behavior; for example a response that was "faked" in terms of level of difficulty reported or not completed by the named respondent. In addition to intentional misunderstanding, there should be some mechanisms in place to identify misunderstanding or mistaken responses due to linguistic or cultural issues, cognitive or other limitations of respondents, poor question wording etc. In addition, it will be necessary to have an understanding of any systemic or other biases in the data collected. Cross-domain validation could also be a permanent feature of the quality control system.

POSSIBLE "AGGREGATION BIAS"

In developing O*NET, the nearly 12,000 DOT occupations have been collapsed into 1122 "Occupational Units" (OUs). By collapsing the DOT categories into larger OUs with more diverse jobs, the average level of abilities in the OUs will be higher than the level of abilities required by some of the DOT occupations that were combined to create the OU. By virtue of collapsing DOT occupations, many jobs requiring low levels of skills and abilities will disappear resulting in fewer jobs that applicants applying for disabilities will appear to be able to do. Thus, unless SSA is able to somehow correct for this "aggregation bias," direct use of O*NET scales could result in increased numbers of false positives (i.e. incorrect allowances).

Such a possible "aggregation bias" reinforces the importance of access to the raw data by SSA noted in our general comments below.

RESPONSE RATE

The clearance package estimates the response rate will be only 66 percent. As you are well aware OMB requires surveys to indicate the achievement of an 80 percent response rate for approval. We suggest that you consider methods of non-response conversion in addition to the reminder notice you plan to use. We also believe you should identify how you will make adjustments for non-response and methods of data imputation for missing responses that you will use. We strongly suggest that you add tests of non-response conversions to the tests of incentives planned for the pretest.

LABOR MARKET CONCERNS

We are also concerned about the ongoing analysis needed to reflect differences or changes between tight and loose labor markets: does the requirements and activities for each occupation change? Are occupations created, or do they originate, disappear, merge or split apart, depending on the economy?

READING COMPREHENSION LEVEL

The required level of reading comprehension may be too high, as the survey questions seem to be worded at a relatively sophisticated comprehension level, seemingly above the proposed 6th grade reading level. This may hinder the ability to obtain accurate responses from some respondents. Some respondents might have the skills, knowledge, etc., or perform work activities, without understanding the survey questions on those items. Survey respondents who might have difficulty include illiterate persons, or those with low literacy skills, persons with certain disabilities (including learning disabilities), and persons with limited, or no, English language proficiency.

NEED TO INTEGRATE PERSPECTIVES OTHER THAN THOSE OF INDUSTRIAL ORGANIZATIONAL PSYCHOLOGISTS

O*NET employs a single taxonomy for all jobs based on the following characteristics: skills; generalized work activities; abilities; work context, knowledge; education/training; and, work style. It is grounded in industrial/organizational psychology—which DOL cites as O*NET's theoretical basis. Perhaps the Consortium should consider the potential for augmenting this with other psychological and other perspectives.

OTHER GENERAL COMMENTS

On page A-38, the discussion refers to the skills of disabled individuals being important in determining employability. It is not clear if you are referring to skills in the generic sense, or specifically to the O*NET skills category. In either case, please be aware that abilities are also very important in determining employability.

On page A-43, the package indicates that access to the project database will be limited to project staff. Is it true that the O*NET database will not be available? If SSA chooses to utilize O*NET in its disability decisionmaking process, we may want to use some measure of job requirements other than the reported average. For example, rather than rely on the average level reported in the public file, SSA may wish to develop a measure of the "minimal" ability required which could be established at, for example, the second decile, one standard deviation below the mean, or some other level. Without access to the actual raw data, such data manipulation would be impossible.

On page A-44 it is stated that O*NET will draw information from other (outside) sources rather than collect the data as part of the survey data collection process. We suggest that this information also be collected from respondents in the pretest, or on a sample basis, to show that information from outside O*NET is consistent with data collected within O*NET?

On page B-2, a footnote indicates that O*NET is not designed to be used to identify an individual's ability to perform a specific job position, or the accommodations that might be required. It is further noted that such a use would be inappropriate. Does this particular passage draw a difference between ability to do a specific job for a specific employer and the ability to perform in a (generic) job in an OU? If not, are you suggesting that SSA cannot use O*NET for the specific purpose for which the DOT has been used in the past?

IOM CONCERNS

The Institute of Medicine (IOM) has a contract with SSA to review the research SSA has been conducting on development of a redesigned disability decision process. IOM only offers its informed opinion in writing, in the form of reviewed reports.

IOM's second interim report discussed O*NET and raised several issues. Copies of relevant pages of the report are attached. IOM recommended that SSA develop an interim plan in the event that O*NET is either not completed or insufficient to meet the needs of a new disability decision process, though the committee expressed the belief that O*NET may be SSA's best option. The report identified the following issues:

- o the physical ability scales that O*NET uses may not be specific enough for SSA's purpose;
- o there is no evidence that a simple definition of workplace functionality exists, too much depends on the worker and his or her ability to adjust to change and on employer flexibility;
- o physical ability scales in O*NET may be inappropriate for persons with disabilities, lacking job descriptors relating to sustaining work over an 8 hour day, psycho-social characteristics, planning work activity, finishing tasks, etc.; and,
- o no clear approach to using O*NET, considering gaps and timeframes for completion of O*NET data collection.

The report suggested SSA enter into an arrangement with DOL to collect information that would better serve SSA's needs, specifically citing the need to collect information on minimum as well as average job requirements.

(2) validation methods and samples. In addition, VCU also evaluated the availability of instruments in the public domain, global measures that can be applied to all types of disabilities, instruments not requiring administration by a physician or other highly trained specialist, cost of administration, and language. Finally, VCU looked at the extent to which the instruments had been used on the working age population and can be generalized to the SSA claimant population.

VCU's main conclusion in its report was that no government or private entity is currently using functional assessment instruments specifically for determining work disability benefits, and a global measure of functional assessment does not exist that would be a valid indicator of disability for all populations currently served by SSA. Such an instrument will likely have to be developed and tested.

After reviewing the advantages and disadvantages of both functional and clinical assessment measurements for SSA's needs, VCU concluded that objective functional assessment can and should be a component of the redesigned process. It recommended that SSA should use a global functional assessment measure to screen out people who do not have severe disabilities. A combination of clinical and functional assessment measures can be used in the next step to decide if the claimant meets SSA's disability definition. The global screening instrument to assess functional capacity could be standardized and validated on the SSA claimant population.

VCU, however, stopped short of constructing the global measure of functional capacity; instead, it recommended several steps SSA should take in moving toward the development of a global tool. The committee has not been informed of SSA's progress in this activity. VCU further stressed that in order for SSA to use this type of process, it needs to have (1) normative and predictive data for initial screening and determination of severity of disability, and (2) an occupational classification system that can be linked to residual functional capacities.

The committee is concerned that neither VCU nor SSA has made clear what conceptual or theoretical basis exists for believing that such a standardized, universally accepted global instrument applicable to persons with physical and mental impairments can be constructed. SSA needs to describe the basis for this belief, such as results from some developmental work in progress or literature that shows such instruments are in use elsewhere, before committing to such an approach in the new disability decision process.

Recommendation 4-2: The committee recommends that the Social Security Administration develop an alternative plan for use of functional assessment measures in the disability decision process in the event that the proposed global, standardized, functional assessment instrument is not developed and tested in time for implementation.

The committee is convening a workshop in June 1998 to discuss measures of functional capacity and work requirements as they relate to SSA's disability decision process research. *The committee urges SSA to take into consideration the results of the workshop as it proceeds in the area of functional assessment.*

Identification of Occupational Classification Systems

In 1996, SSA contracted with the American Institutes for Research to conduct a comprehensive review of the literature pertaining to systems and methods of classifying

occupations in terms of the physical and mental capacities required, to develop a taxonomy of occupational classification systems, and to assess the applicability of systems for SSA's redesigned disability determination process. This review relates directly to one of the key elements in the proposed redesigned disability decision process, namely, assessing baseline work. The purpose of the review is to determine if a standard exists, and if not, whether it is feasible to develop one to describe basic physical and mental demands of a baseline of work.

AIR's initial search yielded 33 different occupational classification systems. Based on the needs of SSA's disability determination process, AIR further screened these 33 systems and narrowed the search to 14 occupational classification systems. Each of these systems was rated on three criteria—content, technical quality, and usability. AIR concluded that while none of the occupational classification systems exactly or ideally matched SSA's needs, the Occupational Information Network (O*NET) under development was the closest match to SSA's needs.

O*NET is an occupational classification system being developed by the Department of Labor (DOL) under contract with AIR to replace the Dictionary of Occupational Titles. It consists of two databases. The first database is the incumbents' judgments about the skills and abilities needed for their jobs and the work activities they perform. There are over 300 variables per occupation for this database. Currently, O*NET only has data available for 30 of the largest occupations out of the estimated 1,200. DOL is scheduled to complete this database in 3 to 5 years. The second database contains job analysts' ratings of the skills and abilities that they believe are required for different jobs. This database covers all 1,200 occupations, however, it includes only a subset of the 300 variables per occupation. A prototype of the analyst-derived database was released by DOL to interested software developers in the fall of 1997.

One of the reasons AIR recommended O*NET over the other systems is because it uses level scales to measure the amount of skill needed to perform certain jobs. Incumbents choose a numeric rating based on their reading of the behavioral anchors. Cognitive and mental descriptors are also included in O*NET, but the physical ability scales that O*NET uses may not be specific enough to help SSA. For instance, they do not address single arm movements. Measurement of the physical ability scales is more like gross body movements as opposed to, for example, one arm. Because the incumbents' database will not be released for some time, SSA will probably have to use the analysts' database that includes only a subset of the variables that are in the incumbents' database. Although most of the variables SSA is interested in are in this subset, SSA needs to test the analysts' database to see if it contains all the information it needs.

AIR recommended that SSA establish a working relationship with DOL in the development of O*NET, construct a matrix of occupational classification and a functional assessment taxonomy, and conduct an analysis of the O*NET database, before deciding on O*NET as SSA's occupational classification system. The committee is not aware of the extent to which SSA has followed through on these recommendations.

Given the alternatives, the committee believes that O*NET may be the best option for SSA. AIR's suggestion that SSA construct a matrix between O*NET and a functional assessment taxonomy is especially useful, given the unique needs of SSA's disability decision process. Such a matrix would allow SSA to observe, and possibly supplement, any potential gaps that exist within the O*NET database.

Other issues need to be resolved before SSA uses O*NET in its disability determination process. First, there is no evidence that a simple definition of workplace functionality exists. In fact, those working in the field of occupational classification find it difficult to agree on a definition of an occupation that is precise enough to be applied across all workers and in all

not
at work

business establishments. Too much depends on the worker, his or her ability to adjust to change, and on the employer's flexibility.

O*NET comprises a classification of the abilities and strengths required for people to work at certain jobs. SSA's disability determination is primarily based on people's inability to engage in any SGA. It may be difficult for SSA to use O*NET to match people's level of ability to work with specific potential occupations.

Another problem with O*NET is that it provides the average level of performance rating for each occupation. SSA's plans call for a baseline or minimum level of performance, since its goal is to see if people can do any work that is readily available in society, taking into consideration their age, education, and work experience. It is not clear how SSA plans to overcome this problem.

Finally, O*NET's physical ability scales may be inappropriate for persons with disability. However, according to AIR, they can be linked to levels of functioning. For example, O*NET lacks job descriptors related to the ability to sustain work over an 8-hour day for extended periods; psychosocial characteristics; and executive functions, such as planning work activities and schedules; or finishing one task and deciding to start another. These are important reasons why people with disabilities do not have jobs. The committee is concerned that O*NET may not include these characteristics.

The committee questions *how* O*NET will be used. SSA's current research design does not appear to be oriented to address this question. How does SSA plan to supplement O*NET with respect to contextual or other factors that are not well covered. There are no indications in the current research plan that the gaps in O*NET will be carefully considered and specific research identified to fill those gaps. The committee also is concerned about the synchronization of timing for completion of O*NET and SSA's target completion of the research for development and implementation of the disability decision process.

Recommendation 4-3: The committee recommends that the Social Security Administration develop an interim plan for an occupational classification system in the event that the Occupational Information Network (O*NET) database is either not completed or insufficient to meet the needs of a new disability decision process.

The committee believes that SSA should explore entering into some interagency arrangement with the Department of Labor to initiate a version of O*NET that would collect information on minimum as well as average job requirements to better serve SSA's needs to assess ability to engage in substantial gainful activity.

Other Disability Decision Programs

In September 1997, SSA awarded a contract to Westat to review other disability programs, public and private in the United States and in other countries, to determine if such programs have criteria, instruments, or any other features that may be appropriate for use in developing SSA's new disability decision process (SSA, 1997a).

Undoubtedly, one can learn from the experience of other disability benefit programs that face the same general problems as the Social Security disability programs in the United States.

APPENDIX B

Explanation of Worker Trait Components

Those abilities, personal traits, and individual characteristics required of a worker in order to achieve average successful job performance are referred to as worker traits. Occupational information presented in volumes I and II is based in part on analysis of required worker traits in terms of the six distinct worker trait components described in this appendix. These six components have been selected for this purpose because they provide the broadest and yet most comprehensive framework for the effective presentation of worker trait information. Within this framework the user will find data concerning the requirements of jobs for: (1) The amount of general educational development and specific vocational preparation a worker must have, (2) the specific capacities and abilities required of him in order to learn or perform certain tasks or duties, (3) preferences for certain types of work activities or experiences considered necessary for job success, (4) types of occupational situations to which an individual must adjust, (5) physical activities required in work situations, and (6) physical surroundings prevalent in jobs.

Information reflecting significant worker trait requirements is contained, explicitly or by implication, in the job definitions in volume I. In the Worker Traits Arrangement in volume II, the qualifications profile for each worker trait group shows the range of required traits and/or levels of traits for the first five of these components. Numbers or letters are used to identify each specific trait and level. In this appendix, these identifying numbers and letters appear in italics.

The worker trait components are:

- I. Training time (general educational development, specific vocational preparation)
- II. Aptitudes
- III. Interests
- IV. Temperaments
- V. Physical demands
- VI. Working conditions¹

I. Training Time

The amount of general educational development and specific vocational preparation required for a worker to acquire the knowledge and abilities necessary for average performance in a particular job.

General Educational Development: This embraces those aspects of education (formal and informal) which contribute to the worker's (a) reasoning development and ability to follow instructions, and (b) acquisition of "tool" knowledges, such as language and mathematical skills. It is education of a general nature which does not have a recognized, fairly specific, occupational objective. Ordinarily such education is obtained in elementary school, high school, or college. It also derives from experience and individual study.

¹ Working conditions were recorded as part of each job analysis, and are reflected, when appropriate, in job definitions in volume I. However, because they did not contribute to the homogeneity of worker trait groups, they do not appear as a component in the Worker Traits Arrangement.

The following is a table explaining the various levels of general educational development.

GENERAL EDUCATIONAL DEVELOPMENT

Level	Reasoning Development	Mathematical Development	Language Development
6	Apply principles of logical or scientific thinking to a wide range of intellectual and practical problems. Deal with non-verbal symbolism (formulas, scientific equations, graphs, musical notes, etc.) in its most difficult phases. Deal with a variety of abstract and concrete variables. Apprehend the most abstruse classes of concepts.	Apply knowledge of advanced mathematical and statistical techniques such as differential and integral calculus, factor analysis, and probability determination, or work with a wide variety of theoretical mathematical concepts and make original applications of mathematical procedures, as in empirical and differential equations.	Comprehension and expression of a level to —Report, write, or edit articles for such publications as newspapers, magazines, and technical or scientific journals. Prepare and draw up deeds, leases, wills, mortgages, and contracts. —Prepare and deliver lectures on politics, economics, education, or science. —Interview, counsel, or advise such people as students, clients, or patients, in such matters as welfare eligibility, vocational rehabilitation, mental hygiene, or marital relations. —Evaluate engineering technical data to design buildings and bridges.
6	Apply principles of logical or scientific thinking to define problems, collect data, establish facts, and draw valid conclusions. Interpret an extensive variety of technical instructions, in books, manuals, and mathematical or diagrammatic form. Deal with several abstract and concrete variables.	Perform ordinary arithmetic, algebraic, and geometric procedures in standard, practical applications.	Comprehension and expression of a level to —Transcribe dictation, make appointments for executive and handle his personal mail, interview and screen people wishing to speak to him, and write routine correspondence on own initiative. —Interview job applicants to determine work best suited for their abilities and experience, and contact employers to interest them in services of agency. —Interpret technical manuals as well as drawings and specifications, such as layouts, blueprints, and schematics.
4	Apply principles of rational systems ¹ to solve practical problems and deal with a variety of concrete variables in situations where only limited standardization exists. Interpret a variety of instructions furnished in written, oral, diagrammatic, or schedule form.	Make arithmetic calculations involving fractions, decimals and percentages.	Comprehension and expression of a level to —File, post, and mail such material as forms, checks, receipts, and bills. —Copy data from one record to another, fill in report forms, and type all work from rough draft or corrected copy. —Interview members of household to obtain such information as age, occupation, and number of children, to be used as data for surveys, or economic studies. —Guide people on tours through historical or public buildings, describing such features as size, value, and points of interest.
3	Apply common sense understanding to carry out instructions furnished in written, oral, or diagrammatic form. Deal with problems involving several concrete variables in or from standardized situations.	Use arithmetic to add, subtract, multiply, and divide whole numbers.	Comprehension and expression of a level to —Learn job duties from oral instructions or demonstration. —Write identifying information, such as name and address of customer, weight, number, or type of product, on tags, or slips. —Request orally, or in writing, such supplies as linen, soap, or work materials.
2	Apply common sense understanding to carry out detailed but uninvolved written or oral instructions. Deal with problems involving a few concrete variables in or from standardized situations.	Perform simple addition and subtraction, reading and copying of figures, or counting and recording.	
1	Apply common sense understanding to carry out simple one- or two-step instructions. Deal with standardized situations with occasional or no variables in or from these situations encountered on the job.		

¹ Examples of "principles of rational systems" are: Bookkeeping, internal combustion engines, electric wiring systems, house building, nursing, farm management, ship sailing.

Specific Vocational Preparation: The amount of time required to learn the techniques, acquire information, and develop the facility needed for average performance in a specific job-worker situation. This training may be acquired in a school, work, military, institutional, or avocational environment. It does not include orientation training required of even every fully qualified worker to become accustomed to the special conditions of any new job. Specific vocational training includes training given in any of the following circumstances:

- Vocational education (such as high school commercial or shop training, technical school, art school, and that part of college training which is organized around a specific vocational objective);
- Apprentice training (for apprenticeable jobs only);
- In-plant training (given by an employer in the form of organized classroom study);
- On-the-job training (serving as learner or trainee on the job under the instruction of a qualified worker);
- Essential experience in other jobs (serving in less responsible jobs which lead to the higher grade job or serving in other jobs which qualify).

The following is an explanation of the various levels of specific vocational preparation.

Level	Time	Level	Time
1	Short demonstration only.	5	Over 6 months up to and including 1 year.
2	Anything beyond short demonstration up and including 30 days.	6	Over 1 year up to and including 2 years.
3	Over 30 days up to and including 3 months.	7	Over 2 years up to and including 4 years.
4	Over 3 months up to and including 6 months.	8	Over 4 years up to and including 10 years.
		9	Over 10 years.

II. APTITUDES

Specific capacities and abilities required of an individual in order to learn or perform adequately a task or job duty.

- G INTELLIGENCE:** General learning ability. The ability to "catch on" or understand instructions and underlying principles. Ability to reason and make judgments. Closely related to doing well in school.
- V VERBAL:** Ability to understand meanings of words and ideas associated with them, and to use them effectively. To comprehend language, to understand relationships between words, and to understand meanings of whole sentences and paragraphs. To present information or ideas clearly.
- N NUMERICAL:** Ability to perform arithmetic operations quickly and accurately.
- S SPATIAL:** Ability to comprehend forms in space and understand relationships of plane and solid objects. May be used in such tasks as blueprint reading and in solving geometry problems. Frequently described as the ability to "visualize" objects of two or three dimensions, or to think visually of geometric forms.
- P FORM PERCEPTION:** Ability to perceive pertinent detail in objects or in pictorial or graphic material; To make visual comparisons and discriminations and see slight differences in shapes and shadings of figures and widths and lengths of lines.
- Q CLERICAL PERCEPTION:** Ability to perceive pertinent detail in verbal or tabular material. To observe differences in copy, to proofread words and numbers, and to avoid perceptual errors in arithmetic computation.
- K MOTOR COORDINATION:** Ability to coordinate eyes and hands or fingers rapidly and accurately in making precise movements with speed. Ability to make a movement response accurately and quickly.
- F FINGER DEXTERITY:** Ability to move the fingers and manipulate small objects with the fingers rapidly or accurately.
- M MANUAL DEXTERITY:** Ability to move the hands easily and skillfully. To work with the hands in placing and turning motions.
- E EYE-HAND-FOOT COORDINATION:** Ability to move the hand and foot coordinately with each other in accordance with visual stimuli.
- C COLOR DISCRIMINATION:** Ability to perceive or recognize similarities or differences in colors, or in shades or other values of the same color; to identify a particular color, or to recognize harmonious or contrasting color combinations, or to match colors accurately.

Explanation of Levels

The digits indicate how much of each aptitude the job requires for satisfactory (average) performance. The average requirements, rather than maximum or minimum, are cited. The amount required is expressed in terms of equivalent amounts possessed by segments of the general working population.

The following scale is used:

- 1 The top 10 percent of the population. This segment of the population possesses an extremely high degree of the aptitude.
- 2 The highest third exclusive of the top 10 percent of the population. This segment of the population possesses an above average or high degree of the aptitude.
- 3 The middle third of the population. This segment of the population possesses a medium degree of the aptitude, ranging from slightly below to slightly above average.
- 4 The lowest third exclusive of the bottom 10 percent of the population. This segment of the population possesses a below average or low degree of the aptitude.
- 5 The lowest 10 percent of the population. This segment of the population possesses a negligible degree of the aptitude.

Significant Aptitudes

Certain aptitudes appear in boldface type on the qualifications profiles for the worker trait groups. These aptitudes are considered to be occupationally significant for the specific group; i.e., essential for average successful job performance. All boldface aptitudes are not necessarily required of a worker for each individual job within a worker trait group, but some combination of them is essential in every case.

III. INTERESTS

Preferences for certain types of work activities or experiences, with accompanying rejection of contrary types of activities or experiences. Five pairs of interest factors are provided so that a positive preference for one factor of a pair also implies rejection of the other factor of that pair.

- | | | | | |
|---|---|-----|---|---|
| 1 | Situations involving a preference for activities dealing with things and objects. | vs. | 6 | Situations involving a preference for activities concerned with people and the communication of ideas. |
| 2 | Situations involving a preference for activities involving business contact with people. | vs. | 7 | Situations involving a preference for activities of a scientific and technical nature. |
| 3 | Situations involving a preference for activities of a routine, concrete, organized nature. | vs. | 8 | Situations involving a preference for activities of an abstract and creative nature. |
| 4 | Situations involving a preference for working for people for their presumed good, as in the social welfare sense, or for dealing with people and language in social situations. | vs. | 9 | Situations involving a preference for activities that are nonsocial in nature, and are carried on in relation to processes, machines, and techniques. |
| 5 | Situations involving a preference for activities resulting in prestige or the esteem of others. | vs. | 0 | Situations involving a preference for activities resulting in tangible, productive satisfaction. |

IV. TEMPERAMENTS

Different types of occupational situations to which workers must adjust.

- 1 Situations involving a variety of duties often characterized by frequent change.
- 2 Situations involving repetitive or short cycle operations carried out according to set procedures or sequences.
- 3 Situations involving doing things only under specific instruction, allowing little or no room for independent action or judgment in working out job problems.
- 4 Situations involving the direction, control, and planning of an entire activity or the activities of others.
- 5 Situations involving the necessity of dealing with people in actual job duties beyond giving and receiving instructions.
- 6 Situations involving working alone and apart in physical isolation from others, although the activity may be integrated with that of others.
- 7 Situations involving influencing people in their opinions, attitudes, or judgments about ideas or things.
- 8 Situations involving performing adequately under stress when confronted with the critical or unexpected or when taking risks.
- 9 Situations involving the evaluation (arriving at generalizations, judgments, or decisions) of information against sensory or judgmental criteria.
- 0 Situations involving the evaluation (arriving at generalizations, judgments, or decisions) of information against measurable or verifiable criteria.
- X Situations involving the interpretation of feelings, ideas, or facts in terms of personal viewpoint.
- Y Situations involving the precise attainment of set limits, tolerances, or standards.

V. PHYSICAL DEMANDS

Physical demands are those physical activities required of a worker in a job.

The physical demands referred to in this Dictionary serve as a means of expressing both the physical requirements of the job and the physical capacities (specific physical traits) a worker must have to meet the requirements. For example, "seeing" is the name of a physical demand required by many jobs (perceiving by the sense of vision), and also the name of a specific capacity possessed by many people (having the power of sight). The worker must possess physical capacities at least in an amount equal to the physical demands made by the job.

The Factors

- 1 **Lifting, Carrying, Pushing, and/or Pulling (Strength).** These are the primary "strength" physical requirements, and generally speaking, a person who engages in one of these activities can engage in all. Specifically, each of these activities can be described as:
 - (1) **Lifting:** Raising or lowering an object from one level to another (includes upward pulling).
 - (2) **Carrying:** Transporting an object, usually holding it in the hands or arms or on the shoulder.
 - (3) **Pushing:** Exerting force upon an object so that the object moves away from the force (includes slapping, striking, kicking, and treadle actions).
 - (4) **Pulling:** Exerting force upon an object so that the object moves toward the force (includes jerking).
- The five degrees of Physical Demands Factor No. 1 (Lifting, Carrying, Pushing, and/or Pulling), are as follows:

Key to Tables:

SVP- DOT's Specific Vocational Preparation Variable

- 1- Short demonstration time only
- 2- Up to 30 days training
- 3- Over 30 days, up to 3 months
- 4- Over 3 months, up to 6 months
- 5- Over 6 months up to 1 year
- 6- Over 1 year, up to 2 years
- 7- Over 2 years, up to 4 years
- 8- Over 4 years, up to 10 years
- 9- Over 10 years

(SVP values of 1 or 2 denote unskilled work)

STR- DOT's Strength Variable

- S- Sedentary
- L- Light
- M- Medium
- H- Heavy
- V- Very Heavy

SVP and STR are the variables used in the vocational grids to assess training and physical requirements for jobs.

OUTITLE=All Other Machine Operators and Tenders

SVP	Frequency	Cumulative Frequency
1	2	2
2	272	274
3	174	448
4	78	526
5	21	547
6	12	559

STR	Frequency	Cumulative Frequency
S	8	8
L	296	304
M	201	505
H	53	558
V	1	559

TABLE OF SVP BY STR

SVP	STR					Total
	S	L	M	H	V	
1	0	2	0	0	0	2
2	3	153	95	20	1	272
3	5	83	67	19	0	174
4	0	41	28	9	0	78
5	0	11	7	3	0	21
6	0	6	4	2	0	12
Total	8	296	201	53	1	559

ANALYSES FOR EXAMINING 137 DOIS
 SVP and Strength ratings for 40 OUs

OUTITLE=All Other Metal and Plastic (Cutting, F

SVP	Frequency	Cumulative Frequency
2	55	55
3	32	87
4	31	118
5	20	138
6	6	144

STR	Frequency	Cumulative Frequency
S	5	5
L	60	65
M	65	130
H	14	144

TABLE OF SVP BY STR

SVP	STR				Total
	Frequency	S	L	M	
2	4	30	17	4	55
3	1	12	16	3	32
4	0	10	18	3	31
5	0	6	10	4	20
6	0	2	4	0	6
Total	5	60	65	14	144

ANALYSES FOR EXAMINING 107 BOYS
 SVP and Strength ratings for 40 OUs

OUTITLE=All Other Protective Service Workers

SVP	Frequency	Cumulative Frequency
2	3	3
3	1	4

STR	Frequency	Cumulative Frequency
S	1	1
L	3	4

TABLE OF SVP BY STR

SVP	STR		Total
	S	L	
2	1	2	3
3	0	1	1
Total	1	3	4

SVP and Strength ratings for 40 OUs

OUTITLE=Assemblers and Fabricators- Except Mach

SVP	Frequency	Cumulative Frequency
1	8	8
2	192	200
3	156	356
4	71	427
5	32	459
6	6	465

STR	Frequency	Cumulative Frequency
S	49	49
L	237	286
M	138	424
H	41	465

TABLE OF SVP BY STR

SVP	STR				Total
	S	L	M	H	
1	1	7	0	0	8
2	22	117	39	14	192
3	20	75	47	14	156
4	4	28	29	10	71
5	2	8	19	3	32
6	0	2	4	0	6
Total	49	237	138	41	465

ANALYSIS FOR EXAMINING 1975 OUs
 SVP and Strength ratings for 40 OUs

OUTITLE=Billing, Cost, and Rate Clerks

SVP	Frequency	Cumulative Frequency
2	1	1
3	3	4
4	11	15
5	12	27
6	4	31

STR	Frequency	Cumulative Frequency
S	27	27
L	4	31

TABLE OF SVP BY STR

SVP	STR		Total
	S	L	
2	1	0	1
3	3	0	3
4	9	2	11
5	10	2	12
6	4	0	4
Total	27	4	31

SVP and Strength ratings for 40 OUs.

OUTITLE=Cleaning, Washing, and Pickling Equipme

SVP	Frequency	Cumulative Frequency
2	26	26
3	11	37
4	3	40
5	3	43

STR	Frequency	Cumulative Frequency
S	1	1
L	20	21
M	19	40
H	3	43

TABLE OF SVP BY STR

SVP	STR				Total
	Frequency	S	L	M	
2	1	13	10	2	26
3	0	6	5	0	11
4	0	0	3	0	3
5	0	1	1	1	3
Total	1	20	19	3	43

ANALYSES FOR EXAMINING 137 DOTS
 SVP and Strength ratings for 40 OUs

OUTITLE=Coating, Painting, and Spraying Machine

SVP	Frequency	Cumulative Frequency
2	26	26
3	17	43
4	14	57
5	10	67
6	3	70

STR	Frequency	Cumulative Frequency
S	1	1
L	31	32
M	33	65
H	5	70

TABLE OF SVP BY STR

SVP	STR				Total
	S	L	M	H	
2	1	14	9	2	26
3	0	9	7	1	17
4	0	3	10	1	14
5	0	4	5	1	10
6	0	1	2	0	3
Total	1	31	33	5	70

ANALYSES FOR EXAMINING 137 DOTS
 SVP and Strength ratings for 40 OUs

OUTITLE=Couriers and Messengers

SVP	Frequency	Cumulative Frequency
2	7	7

STR	Frequency	Cumulative Frequency
S	1	1
L	5	6
M	1	7

TABLE OF SVP BY STR

SVP	STR			Total
Frequency	S	L	M	
2	1	5	1	7
Total	1	5	1	7

ANALYSES FOR EXAMINING 137 OUS
 SVP and Strength ratings for 40 OUs

OUTITLE=Credit Checkers

SVP	Frequency	Cumulative Frequency
2	1	1
3	1	2
5	1	3

STR	Frequency	Cumulative Frequency
S	3	3

TABLE OF SVP BY STR

SVP	STR	Frequency	Total
2	S	1	1
3	S	1	1
5	S	1	1
Total		3	3

SVP and Strength ratings for 40 OUs

OUTITLE=Crushing, Grinding, Mixing, and Blendin

SVP	Frequency	Cumulative Frequency
2	110	110
3	112	222
4	79	301
5	40	341
6	10	351
7	6	357

Frequency Missing = 1

STR	Frequency	Cumulative Frequency
S	5	5
L	118	123
M	134	257
H	97	354
V	3	357

Frequency Missing = 1

TABLE OF SVP BY STR

Frequency	S	L	M	H	V	Total
2	2	34	40	32	2	110
3	1	36	46	29	0	112
4	1	27	31	19	1	79
5	0	13	13	14	0	40
6	1	5	3	1	0	10
7	0	3	1	2	0	6
Total	5	118	134	97	3	357

Frequency Missing = 1

OUTITLE=Cutters and Trimmers, Hand

SVP	Frequency	Cumulative Frequency
1	10	10
2	44	54
3	25	79
4	9	88

STR	Frequency	Cumulative Frequency
S	8	8
L	53	61
M	20	81
H	5	86
V	2	88

TABLE OF SVP BY STR

SVP	STR					Total
Frequency	S	L	M	H	V	
1	0	8	2	0	0	10
2	3	27	10	3	1	44
3	4	11	7	2	1	25
4	1	7	1	0	0	9
Total	8	53	20	5	2	88

ANALYSES FOR EXAMINING 137 DOTs
 SVP and Strength ratings for 40 OUs

OUTITLE=Cutting and Slicing Machine Operators a

SVP	Frequency	Cumulative Frequency
2	82	82
3	32	114
4	15	129
5	4	133
6	2	135
7	1	136

STR	Frequency	Cumulative Frequency
S	2	2
L	72	74
M	47	121
H	14	135
V	1	136

TABLE OF SVP BY STR

SVP	STR					Total
Frequency	S	L	M	H	V	
2	2	50	19	11	0	82
3	0	14	16	1	1	32
4	0	6	8	1	0	15
5	0	0	3	1	0	4
6	0	1	1	0	0	2
7	0	1	0	0	0	1
Total	2	72	47	14	1	136

ANALYSES FOR EXAMINING 137 DOTS
 SVP and Strength ratings for 40 OUs

OUTITLE=Electrical Components Assemblers

SVP	Frequency	Cumulative Frequency
2	6	6
3	11	17
4	4	21
5	3	24

STR	Frequency	Cumulative Frequency
S	2	2
L	17	19
M	4	23
H	1	24

TABLE OF SVP BY STR

SVP	STR				Total
	S	L	M	H	
2	1	5	0	0	6
3	0	9	1	1	11
4	0	3	1	0	4
5	1	0	2	0	3
Total	2	17	4	1	24

ANALYSES FOR EXAMINING 137 DOTs
 SVP and Strength ratings for 40 OUs

OUTITLE=Electronic Semiconductor Wafer Breakers

SVP	Frequency	Cumulative Frequency
2	5	5

STR	Frequency	Cumulative Frequency
S	2	2
L	1	3
M	1	4
H	1	5

TABLE OF SVP BY STR

SVP	STR				Total
Frequency	S	L	M	H	
2	2	1	1	1	5
Total	2	1	1	1	5

ANALYSES FOR EXAMINING 137 OUS
 SVP and Strength ratings for 40 OUs

OUTITLE=Elemental Hand Workers

SVP	Frequency	Cumulative Frequency
1	18	18
2	161	179
3	106	285
4	12	297
5	1	298

STR	Frequency	Cumulative Frequency
S	30	30
L	168	198
M	78	276
H	22	298

TABLE OF SVP BY STR

SVP	STR				Total
Frequency	S	L	M	H	
1	1	14	3	0	18
2	22	94	38	7	161
3	6	55	33	12	106
4	1	4	4	3	12
5	0	1	0	0	1
Total	30	168	78	22	298

ANALYSES FOR EXAMINING 137 DOTS
 SVP and Strength ratings for 40 OUs

OUTITLE=Extruding, Forming, Pressing, and Compa

SVP	Frequency	Cumulative Frequency
2	55	55
3	48	103
4	30	133
5	9	142
6	3	145
7	2	147

STR	Frequency	Cumulative Frequency
S	1	1
L	67	68
M	64	132
H	15	147

TABLE OF SVP BY STR

SVP	STR				Total
	S	L	M	H	
2	1	28	22	4	55
3	0	22	18	8	48
4	0	10	18	2	30
5	0	3	5	1	9
6	0	2	1	0	3
7	0	2	0	0	2
Total	1	67	64	15	147

ANALYSES FOR EXAMINING 137 OUS
 SVP and Strength ratings for 40 OUs

OUTITLE=Financial Processing and Recording Cler

SVP	Frequency	Cumulative Frequency
2	1	1
3	6	7
4	2	9
5	2	11

STR	Frequency	Cumulative Frequency
S	10	10
L	1	11

TABLE OF SVP BY STR

SVP	STR		Total
	S	L	
2	1	0	1
3	6	0	6
4	2	0	2
5	1	1	2
Total	10	1	11

OUTITLE=Freight, Stock, and Material Movers, Ha

SVP	Frequency	Cumulative Frequency
1	5	5
2	25	30
3	8	38
4	1	39
5	1	40

Frequency Missing = 1

STR	Frequency	Cumulative Frequency
S	1	1
L	1	2
M	15	17
H	21	38
V	2	40

Frequency Missing = 1

TABLE OF SVP BY STR

SVP	STR					Total
	S	L	M	H	V	
1	1	0	0	3	1	5
2	0	1	11	12	1	25
3	0	0	4	4	0	8
4	0	0	0	1	0	1
5	0	0	0	1	0	1
Total	1	1	15	21	2	40

Frequency Missing = 1

OUTITLE=General Office Clerks

SVP	Frequency	Cumulative Frequency
2	11	11
3	28	39
4	11	50
5	12	62
6	4	66
7	2	68

Frequency Missing = 1

STR	Frequency	Cumulative Frequency
S	37	37
L	29	66
M	1	67
V	1	68

Frequency Missing = 1

TABLE OF SVP BY STR

SVP	STR				Total
Frequency	S	L	M	V	
2	3	7	1	0	11
3	16	12	0	0	28
4	5	6	0	0	11
5	9	3	0	0	12
6	3	1	0	0	4
7	1	0	0	1	2
Total	37	29	1	1	68

Frequency Missing = 1

ANALYSES FOR EXAMINING 137 OUS
 SVP and Strength ratings for 40 OUs

OUTITLE=Grinding and Polishing Workers, Hand

SVP	Frequency	Cumulative Frequency
2	16	16
3	24	40
4	14	54
5	6	60
6	4	64

STR	Frequency	Cumulative Frequency
S	7	7
L	28	35
M	23	58
H	5	63
V	1	64

TABLE OF SVP BY STR

SVP	STR					Total
	Frequency	S	L	M	H	
2	3	7	5	1	0	16
3	3	11	8	1	1	24
4	1	9	3	1	0	14
5	0	1	4	1	0	6
6	0	0	3	1	0	4
Total	7	28	23	5	1	64

ANALYSES FOR EXAMINING 137 DOTS
 SVP and Strength ratings for 40 OUs

OUTITLE=Hand Painting, Coating, or Decorating W

SVP	Frequency	Cumulative Frequency
1	2	2
2	44	46
3	22	68
4	17	85
5	6	91
6	3	94

STR	Frequency	Cumulative Frequency
S	18	18
L	44	62
M	29	91
H	3	94

TABLE OF SVP BY STR

SVP	STR				Total
	S	L	M	H	
1	0	2	0	0	2
2	9	23	10	2	44
3	1	9	11	1	22
4	6	5	6	0	17
5	2	3	1	0	6
6	0	2	1	0	3
Total	18	44	29	3	94

ANALYSES FOR EXAMINING 137 DOTs
 SVP and Strength ratings for 40 OUs

OUTITLE=Intermediate Hand Workers

SVP	Frequency	Cumulative Frequency
2	1	1
3	1	2
4	36	38
5	22	60
6	6	66

STR	Frequency	Cumulative Frequency
S	4	4
L	31	35
M	27	62
H	4	66

TABLE OF SVP BY STR

SVP	STR				Total
	S	L	M	H	
2	1	0	0	0	1
3	0	1	0	0	1
4	1	18	15	2	36
5	1	10	10	1	22
6	1	2	2	1	6
Total	4	31	27	4	66

ANALYSES FOR EXAMINING 137 DOIs
 SVP and Strength ratings for 40 OUs

OUTITLE=Interviewing Clerks, Except Personnel a

SVP	Frequency	Cumulative Frequency
2	4	4
3	1	5
4	1	6

STR	Frequency	Cumulative Frequency
S	3	3
L	3	6

TABLE OF SVP BY STR

SVP	STR		Total
	S	L	
2	1	3	4
3	1	0	1
4	1	0	1
Total	3	3	6

OUTITLE=Machine Feeders and Offbearers

SVP	Frequency	Cumulative Frequency
1	42	42
2	241	283
3	5	288
4	2	290
5	1	291

STR	Frequency	Cumulative Frequency
S	3	3
L	116	119
M	104	223
H	64	287
V	4	291

TABLE OF SVP BY STR

SVP	STR					Total
	S	L	M	H	V	
Frequency						
1	1	21	15	5	0	42
2	2	94	87	55	3	241
3	0	0	2	3	0	5
4	0	1	0	1	0	2
5	0	0	0	0	1	1
Total	3	116	104	64	4	291

ANALYSES FOR EXAMINING 137 OUS
 SVP and Strength ratings for 40 OUs

OUTITLE=Machine Forming Operators and Tenders,

SVP	Frequency	Cumulative Frequency
2	19	19
3	21	40
4	17	57
5	10	67
6	1	68
7	4	72

STR	Frequency	Cumulative Frequency
S	4	4
L	24	28
M	34	62
H	10	72

TABLE OF SVP BY STR

SVP	STR				Total
	S	L	M	H	
2	2	9	6	2	19
3	2	4	13	2	21
4	0	5	8	4	17
5	0	4	5	1	10
6	0	1	0	0	1
7	0	1	2	1	4
Total	4	24	34	10	72

OUTITLE=Machine Tool Cutting Operators and Tend

SVP	Frequency	Cumulative Frequency
2	34	34
3	45	79
4	16	95
5	9	104
6	7	111

STR	Frequency	Cumulative Frequency
S	9	9
L	66	75
M	35	110
H	1	111

TABLE OF SVP BY STR

SVP	STR				Total
	S	L	M	H	
2	2	23	9	0	34
3	4	24	17	0	45
4	1	11	4	0	16
5	2	5	2	0	9
6	0	3	3	1	7
Total	9	66	35	1	111

ANALYSES FOR EXAMINING 137 DOIS
 SVP and Strength ratings for 40 OUs

OUTITLE=Order Clerks- Materials, Merchandise, a

SVP	Frequency	Cumulative Frequency
2	1	1
3	2	3
4	2	5
5	1	6
6	1	7

STR	Frequency	Cumulative Frequency
S	5	5
L	2	7

TABLE OF SVP BY STR

SVP	STR		Total
	S	L	
2	1	0	1
3	1	1	2
4	2	0	2
5	0	1	1
6	1	0	1
Total	5	2	7

SVP and Strength ratings for 40 OUs

OUTITLE=Packaging and Filling Machine Operators

SVP	Frequency	Cumulative Frequency
2	50	50
3	18	68
4	5	73
5	1	74

STR	Frequency	Cumulative Frequency
S	1	1
L	44	45
M	19	64
H	10	74

TABLE OF SVP BY STR

SVP	STR				Total
	S	L	M	H	
2	1	34	9	6	50
3	0	9	7	2	18
4	0	1	2	2	5
5	0	0	1	0	1
Total	1	44	19	10	74

ANALYSES FOR EXAMINING 137 DOTs
 SVP and Strength ratings for 40 OUs

OUTITLE=Packers and Packagers, Hand

SVP	Frequency	Cumulative Frequency
1	11	11
2	43	54
3	4	58
4	1	59

STR	Frequency	Cumulative Frequency
S	2	2
L	29	31
M	18	49
H	10	59

TABLE OF SVP BY STR

SVP	STR				Total
	S	L	M	H	
1	0	8	2	1	11
2	2	21	13	7	43
3	0	0	2	2	4
4	0	0	1	0	1
Total	2	29	18	10	59

ANALYSES FOR EXAMINING 137 DOTs
 SVP and Strength ratings for 40 OUs

OUTITLE=Printing Press Machine Operators and Te

SVP	Frequency	Cumulative Frequency
2	13	13
3	12	25
4	7	32
5	5	37
6	2	39
7	1	40

STR	Frequency	Cumulative Frequency
S	1	1
L	23	24
M	14	38
H	2	40

TABLE OF SVP BY STR

SVP	STR				Total
	S	L	M	H	
2	1	8	3	1	13
3	0	11	1	0	12
4	0	3	4	0	7
5	0	1	3	1	5
6	0	0	2	0	2
7	0	0	1	0	1
Total	1	23	14	2	40

ANALYSES FOR EXAMINING 137 OUS
 SVP and Strength ratings for 40 OUs

OUTITLE=Production Inspectors, Testers, Graders

SVP	Frequency	Cumulative Frequency
1	4	4
2	168	172
3	210	382
4	168	550
5	73	623
6	19	642
7	10	652
8	2	654

STR	Frequency	Cumulative Frequency
S	56	56
L	508	564
M	77	641
H	13	654

TABLE OF SVP BY STR

SVP	STR				Total
	S	L	M	H	
1	0	3	0	1	4
2	14	131	17	6	168
3	22	167	21	0	210
4	17	130	18	3	168
5	2	55	16	0	73
6	1	13	3	2	19
7	0	7	2	1	10
8	0	2	0	0	2
Total	56	508	77	13	654

ANALYSES FOR EXAMINING 137 DOTs
 SVP and Strength ratings for 40 OUs

OUTITLE=Production Laborers

SVP	Frequency	Cumulative Frequency
1	62	62
2	377	439
3	54	493
4	5	498
5	1	499

STR	Frequency	Cumulative Frequency
S	12	12
L	166	178
M	191	369
H	123	492
V	7	499

TABLE OF SVP BY STR

SVP	STR					Total
Frequency	S	L	M	H	V	
1	2	31	16	12	1	62
2	10	125	148	89	5	377
3	0	8	25	21	0	54
4	0	1	2	1	1	5
5	0	1	0	0	0	1
Total	12	166	191	123	7	499

ANALYSES FOR EXAMINING 137 DOTs
 SVP and Strength ratings for 40 OUs

OUTITLE=Production, Planning, and Expediting C1

SVP	Frequency	Cumulative Frequency
2	4	4
3	12	16
4	14	30
5	16	46
6	14	60
7	1	61
8	1	62

STR	Frequency	Cumulative Frequency
S	28	28
L	31	59
M	3	62

TABLE OF SVP BY STR

SVP	STR			Total
	Frequency	S	L	
2	1	2	1	4
3	6	6	0	12
4	7	6	1	14
5	7	9	0	16
6	6	7	1	14
7	0	1	0	1
8	1	0	0	1
Total	28	31	3	62

ANALYSES FOR EXAMINING 137 DOCS
 SVP and Strength ratings for 40 OUs

OUTITLE=Receptionists and Information Clerks

SVP	Frequency	Cumulative Frequency
2	2	2
3	4	6
4	4	10
5	3	13
6	1	14

STR	Frequency	Cumulative Frequency
S	10	10
L	4	14

TABLE OF SVP BY STR

SVP	STR		Total
	S	L	
2	1	1	2
3	3	1	4
4	4	0	4
5	1	2	3
6	1	0	1
Total	10	4	14

ANALYSES FOR EXAMINING 137 OUS
 SVP and Strength ratings for 40 OUs

OUTITLE=Sewers, Hand

SVP	Frequency	Cumulative Frequency
2	6	6
3	6	12
4	3	15
5	3	18
6	3	21

STR	Frequency	Cumulative Frequency
S	1	1
L	16	17
M	4	21

TABLE OF SVP BY STR

SVP	STR			Total
	S	L	M	
2	1	3	2	6
3	0	5	1	6
4	0	3	0	3
5	0	2	1	3
6	0	3	0	3
Total	1	16	4	21

PARAMETERS FOR EXAMINING 157 JOBS
 SVP and Strength ratings for 40 OUs

OUTITLE=Sewing Machine Operators, Non-Garment

SVP	Frequency	Cumulative Frequency
2	6	6
3	16	22
4	16	38
5	1	39
6	1	40

STR	Frequency	Cumulative Frequency
S	3	3
L	32	35
M	5	40

TABLE OF SVP BY STR

SVP	STR			Total
Frequency	S	L	M	
2	2	4	0	6
3	1	11	4	16
4	0	15	1	16
5	0	1	0	1
6	0	1	0	1
Total	3	32	5	40

ANALYSES FOR EXAMINING 137 OUs
 SVP and Strength ratings for 40 OUs

OUTITLE=Textile Machine Operators and Tenders-

SVP	Frequency	Cumulative Frequency
2	46	46
3	40	86
4	27	113
5	9	122
6	1	123

STR	Frequency	Cumulative Frequency
S	2	2
L	62	64
M	47	111
H	11	122
V	1	123

TABLE OF SVP BY STR

SVP	STR					Total	
	Frequency	S	L	M	H		V
2	2	2	25	12	6	1	46
3	0	0	16	21	3	0	40
4	0	0	14	11	2	0	27
5	0	0	7	2	0	0	9
6	0	0	0	1	0	0	1
Total		2	62	47	11	1	123

ANALYSES FOR EXAMINING 137 DOTs
 SVP and Strength ratings for 40 OUs

OUTITLE=Truck Drivers, Light- Including Deliver

SVP	Frequency	Cumulative Frequency
2	1	1
3	5	6

STR	Frequency	Cumulative Frequency
S	1	1
L	1	2
M	4	6

TABLE OF SVP BY STR

SVP	STR			Total
	S	L	M	
Frequency	1	0	0	1
2	0	1	4	5
3	1	1	4	6
Total	1	1	4	6

OUTITLE=Typists, Including Word Processing

SVP	Frequency	Cumulative Frequency
2	1	1
3	1	2
4	1	3
5	4	7

STR	Frequency	Cumulative Frequency
S	7	7

TABLE OF SVP BY STR

SVP	STR	Total
2	S	1
3	S	1
4	S	1
5	S	4
Total	S	7

KNOWLEDGE FOR EXAMINING 137 DOTS
 SVP and Strength ratings for 40 OUs

OUTITLE=Umpires, Referees, and Other Sports Off

SVP	Frequency	Cumulative Frequency
2	2	2
3	4	6
4	4	10
6	3	13
7	1	14
8	4	18

STR	Frequency	Cumulative Frequency
S	4	4
L	14	18

TABLE OF SVP BY STR

SVP	STR		Total
	S	L	
2	1	1	2
3	0	4	4
4	2	2	4
6	0	3	3
7	0	1	1
8	1	3	4
Total	4	14	18

ANALYSES FOR EXAMINING 137 OUs
 SVP and Strength ratings for 40 OUs

OUTITLE=All Other Machine Operators and Tenders

Variable	N	Mean	Std Dev	Minimum	Maximum
STR	559	2.54	0.69	1.00	5.00
SVP	559	2.79	0.97	1.00	6.00

OUTITLE=All Other Metal and Plastic (Cutting, F

Variable	N	Mean	Std Dev	Minimum	Maximum
STR	144	2.61	0.71	1.00	4.00
SVP	144	3.24	1.22	2.00	6.00

OUTITLE=All Other Protective Service Workers

Variable	N	Mean	Std Dev	Minimum	Maximum
STR	4	1.75	0.50	1.00	2.00
SVP	4	2.25	0.50	2.00	3.00

OUTITLE=Assemblers and Fabricators- Except Mach

Variable	N	Mean	Std Dev	Minimum	Maximum
STR	465	2.37	0.79	1.00	4.00
SVP	465	2.88	1.01	1.00	6.00

OUTITLE=Billing, Cost, and Rate Clerks

Variable	N	Mean	Std Dev	Minimum	Maximum
STR	31	1.13	0.34	1.00	2.00
SVP	31	4.48	0.96	2.00	6.00

OUTITLE=Cleaning, Washing, and Pickling Equipme

Variable	N	Mean	Std Dev	Minimum	Maximum
STR	43	2.56	0.67	1.00	4.00
SVP	43	2.60	0.90	2.00	5.00

OUTITLE=Coating, Painting, and Spraying Machine

Variable	N	Mean	Std Dev	Minimum	Maximum
STR	70	2.60	0.65	1.00	4.00
SVP	70	3.24	1.22	2.00	6.00

OUTITLE=Couriers and Messengers

Variable	N	Mean	Std Dev	Minimum	Maximum
STR	7	2.00	0.58	1.00	3.00
SVP	7	2.00	0.00	2.00	2.00

OUTITLE=Credit Checkers

Variable	N	Mean	Std Dev	Minimum	Maximum
STR	3	1.00	0.00	1.00	1.00
SVP	3	3.33	1.53	2.00	5.00

OUTITLE=Crushing, Grinding, Mixing, and Blendin

Variable	N	Mean	Std Dev	Minimum	Maximum
STR	357	2.93	0.83	1.00	5.00
SVP	357	3.29	1.19	2.00	7.00

ANALYSES FOR EXAMINING 137 OUS
SVP and Strength ratings for 40 OUs

OUTITLE=Cutters and Trimmers, Hand

Variable	N	Mean	Std Dev	Minimum	Maximum
STR	88	2.32	0.81	1.00	5.00
SVP	88	2.38	0.82	1.00	4.00

OUTITLE=Cutting and Slicing Machine Operators a

Variable	N	Mean	Std Dev	Minimum	Maximum
STR	136	2.56	0.73	1.00	5.00
SVP	136	2.64	0.98	2.00	7.00

OUTITLE=Electrical Components Assemblers

Variable	N	Mean	Std Dev	Minimum	Maximum
STR	24	2.17	0.64	1.00	4.00
SVP	24	3.17	0.96	2.00	5.00

OUTITLE=Electronic Semiconductor Wafer Breakers

Variable	N	Mean	Std Dev	Minimum	Maximum
STR	5	2.20	1.30	1.00	4.00
SVP	5	2.00	0.00	2.00	2.00

OUTITLE=Elemental Hand Workers

Variable	N	Mean	Std Dev	Minimum	Maximum
STR	298	2.31	0.75	1.00	4.00
SVP	298	2.39	0.68	1.00	5.00

ANALYSES FOR EXAMINING 137 OUS
 SVP and Strength ratings for 40 OUs

OUTITLE=Extruding, Forming, Pressing, and Compa

Variable	N	Mean	Std Dev	Minimum	Maximum
STR	147	2.63	0.67	1.00	4.00
SVP	147	3.07	1.11	2.00	7.00

OUTITLE=Financial Processing and Recording Cler

Variable	N	Mean	Std Dev	Minimum	Maximum
STR	11	1.09	0.30	1.00	2.00
SVP	11	3.45	0.93	2.00	5.00

OUTITLE=Freight, Stock, and Material Movers, Ha

Variable	N	Mean	Std Dev	Minimum	Maximum
STR	40	3.55	0.75	1.00	5.00
SVP	40	2.20	0.79	1.00	5.00

OUTITLE=General Office Clerks

Variable	N	Mean	Std Dev	Minimum	Maximum
STR	68	1.51	0.68	1.00	5.00
SVP	68	3.65	1.28	2.00	7.00

OUTITLE=Grinding and Polishing Workers, Hand

Variable	N	Mean	Std Dev	Minimum	Maximum
STR	64	2.45	0.85	1.00	5.00
SVP	64	3.34	1.14	2.00	6.00

OUTITLE=Hand Painting, Coating, or Decorating W

Variable	N	Mean	Std Dev	Minimum	Maximum
STR	94	2.18	0.78	1.00	4.00
SVP	94	2.89	1.13	1.00	6.00

OUTITLE=Intermediate Hand Workers

Variable	N	Mean	Std Dev	Minimum	Maximum
STR	66	2.47	0.71	1.00	4.00
SVP	66	4.47	0.75	2.00	6.00

OUTITLE=Interviewing Clerks, Except Personnel a

Variable	N	Mean	Std Dev	Minimum	Maximum
STR	6	1.50	0.55	1.00	2.00
SVP	6	2.50	0.84	2.00	4.00

OUTITLE=Machine Feeders and Offbearers

Variable	N	Mean	Std Dev	Minimum	Maximum
STR	291	2.83	0.83	1.00	5.00
SVP	291	1.90	0.46	1.00	5.00

OUTITLE=Machine Forming Operators and Tenders,

Variable	N	Mean	Std Dev	Minimum	Maximum
STR	72	2.69	0.78	1.00	4.00
SVP	72	3.51	1.35	2.00	7.00

OUTITLE=Machine Tool Cutting Operators and Tend

Variable	N	Mean	Std Dev	Minimum	Maximum
STR	111	2.25	0.61	1.00	4.00
SVP	111	3.19	1.15	2.00	6.00

OUTITLE=Order Clerks- Materials, Merchandise, a

Variable	N	Mean	Std Dev	Minimum	Maximum
STR	7	1.29	0.49	1.00	2.00
SVP	7	3.86	1.35	2.00	6.00

OUTITLE=Packaging and Filling Machine Operators

Variable	N	Mean	Std Dev	Minimum	Maximum
STR	74	2.51	0.74	1.00	4.00
SVP	74	2.42	0.68	2.00	5.00

OUTITLE=Packers and Packagers, Hand

Variable	N	Mean	Std Dev	Minimum	Maximum
STR	59	2.61	0.81	1.00	4.00
SVP	59	1.92	0.57	1.00	4.00

OUTITLE=Printing Press Machine Operators and Te

Variable	N	Mean	Std Dev	Minimum	Maximum
STR	40	2.43	0.64	1.00	4.00
SVP	40	3.35	1.33	2.00	7.00

SVP and Strength ratings for 40 OUs

OUTITLE=Production Inspectors, Testers, Graders

Variable	N	Mean	Std Dev	Minimum	Maximum
STR	654	2.07	0.53	1.00	4.00
SVP	654	3.37	1.20	1.00	8.00

OUTITLE=Production Laborers

Variable	N	Mean	Std Dev	Minimum	Maximum
STR	499	2.89	0.85	1.00	5.00
SVP	499	2.01	0.54	1.00	5.00

OUTITLE=Production, Planning, and Expediting Cl

Variable	N	Mean	Std Dev	Minimum	Maximum
STR	62	1.60	0.59	1.00	3.00
SVP	62	4.50	1.34	2.00	8.00

OUTITLE=Receptionists and Information Clerks

Variable	N	Mean	Std Dev	Minimum	Maximum
STR	14	1.29	0.47	1.00	2.00
SVP	14	3.79	1.19	2.00	6.00

OUTITLE=Sewers, Hand

Variable	N	Mean	Std Dev	Minimum	Maximum
STR	21	2.14	0.48	1.00	3.00
SVP	21	3.57	1.43	2.00	6.00

ANALYSES FOR EXAMINING 137 OUS
 SVP and Strength ratings for 40 OUs

OUTITLE=Sewing Machine Operators, Non-Garment

Variable	N	Mean	Std Dev	Minimum	Maximum
STR	40	2.05	0.45	1.00	3.00
SVP	40	3.38	0.87	2.00	6.00

OUTITLE=Textile Machine Operators and Tenders-

Variable	N	Mean	Std Dev	Minimum	Maximum
STR	123	2.57	0.71	1.00	5.00
SVP	123	3.02	0.98	2.00	6.00

OUTITLE=Truck Drivers, Light- Including Deliver

Variable	N	Mean	Std Dev	Minimum	Maximum
STR	6	2.50	0.84	1.00	3.00
SVP	6	2.83	0.41	2.00	3.00

OUTITLE=Typists, Including Word Processing

Variable	N	Mean	Std Dev	Minimum	Maximum
STR	7	1.00	0.00	1.00	1.00
SVP	7	4.14	1.21	2.00	5.00

OUTITLE=Umpires, Referees, and Other Sports Off

Variable	N	Mean	Std Dev	Minimum	Maximum
STR	18	1.78	0.43	1.00	2.00
SVP	18	4.94	2.18	2.00	8.00

Table 1. Frequency of DOTs for each SVP Rating: for those DOTs that Match to Occupational Units Corresponding to the 137 Target DOTs.

SVP	Frequency	Percent	Cumulative Percent
Not applicable or none	164	3.4	3.4
Up to and Including 1 month	2162	44.8	48.2
Over 1 month, up to and including 3 months	1278	26.5	74.6
Over 3 months, up to and including 6 months	731	15.1	89.8
Over 6 months, up to and including 1 year	342	7.1	96.9
Over 1 year, up to and including 2 years	116	2.4	99.3
Over 2 years, up to and including 4 years	28	0.6	99.9
Over 4 years, up to and including 6 years	7	0.1	100
Total	4828	100	

Table 2. Frequency of DOTs for each Strength Rating: for those DOTs that Match to the 40 Occupational Units Corresponding to the 137 Target DOTs.

Strength	Frequency	Percent	Cumulative Percent
Sedentary	375	7.8	7.8
Light	2427	50.3	58.1
Medium	1455	30.1	88.2
Heavy	548	11.4	99.5
Very Heavy	23	0.5	100
Total	4828	100	

Table 3. Crosstabulation of DOTs by SVP and Strength Rating: for those DOTs that Match to the 40 Occupational Units Corresponding to the 137 Target DOTs.

SVP	S	L	M	H	V	Total
Not applicable or none	6	96	38	22	2	164
Up to and Including 1 month	131	1095	635	287	14	2162
Over 1 month, up to and including 3 months	108	634	404	129	3	1278
Over 3 months, up to and including 6 months	66	371	227	65	2	731
Over 6 months, up to and including 1 year	43	155	110	33	1	342
Over 1 year, up to and including 2 years	18	55	35	8		116
Over 2 years, up to and including 4 years	1	16	6	4	1	28
Over 4 years, up to and including 6 years	2	5				7
Total	375	2427	1455	548	23	4828

Table 4. Frequency of DOTs for each Strength Rating: for those DOTs that Match to Occupational Units with a Job Zone=1.

	Strength Rating					Total
	S	L	M	H	V	
Credit Authorizers	1	0	0	0	0	1
Directory Assistance Operators	1	0	0	0	0	1
Manicurists	2	0	0	0	0	2
Credit Checkers	3	0	0	0	0	3
Billing, Posting, and Calculating Machine Operators	5	0	0	0	0	5
Financial Processing and Recording Clerks	10	1	0	0	0	11
Switchboard Operators	4	1	0	0	0	5
Receptionists and Information Clerks	10	4	0	0	0	14
Teacher Aides and Educational Assistants, Clerical	2	1	0	0	0	3
Procurement Clerks	1	1	0	0	0	2
Investigators, Clerical	2	2	0	0	0	4
Interviewing Clerks, Except Personnel and Social Welfare	3	3	0	0	0	6
File Clerks	2	4	0	0	0	6
Demonstrators and Promoters	2	7	0	0	0	9
Etchers, Hand	1	5	0	0	0	6
Aerial Tram Tenders	0	1	0	0	0	1
Bailiffs	0	1	0	0	0	1
Cannery Workers	0	1	0	0	0	1
Central Office Operators	0	1	0	0	0	1
Combined Food Preparation and Service Workers	0	1	0	0	0	1
Cooks, Short Order	0	1	0	0	0	1
Glass Cutting Machine Setters and Set-Up Operators	0	1	0	0	0	1
Meter Readers, Utilities	0	1	0	0	0	1
Parking Enforcement Officers	0	1	0	0	0	1
Phlebotomists	0	1	0	0	0	1
Food Order Expeditors	0	2	0	0	0	2
Pressers, Hand	0	2	0	0	0	2
Site Leasing and Promotion Agents	0	2	0	0	0	2
Test Card and Circuit Board Repairers	0	2	0	0	0	2
Bartenders	0	3	0	0	0	3
Crossing Guards	0	3	0	0	0	3
Parking Lot Attendants	0	3	0	0	0	3
Passenger Service Representatives	0	3	0	0	0	3
Social Escorts	0	3	0	0	0	3
Extras/Stand-Ins	0	4	0	0	0	4
Fund Raisers and Solicitors	0	4	0	0	0	4
Marking Clerks	0	4	0	0	0	4

Table 4. Frequency of DOTs for each Strength Rating: for those DOTs that Match to Occupational Units with a Job Zone=1.

	Strength Rating					Total
	S	L	M	H	V	
Models	0	4	0	0	0	4
Shoe Sewing Machine Operators and Tenders	0	4	0	0	0	4
Counter Attendants- Lunchroom, Coffee Shop, or Cafeteria	0	5	0	0	0	5
Ushers, Lobby Attendants, and Ticket Takers	0	5	0	0	0	5
Bath and Restroom Attendants	0	7	0	0	0	7
Library Assistants and Bookmobile Drivers	0	7	0	0	0	7
Tour Guides and Escorts	0	7	0	0	0	7
Sewing Machine Operators, Garment	0	87	0	0	0	87
Cashiers, General	6	13	1	0	0	20
Pantograph Engravers	1	3	1	0	0	5
Couriers and Messengers	1	5	1	0	0	7
Battery Assemblers	0	7	1	0	0	8
Electronic Semiconductor Processors	0	7	1	0	0	8
Bindery Machine Operators and Tenders	0	6	1	0	0	7
Solderers	0	6	1	0	0	7
Mail Machine Operators, Preparation and Handling	0	5	1	0	0	6
Marking and Identification Printing Machine Setters and Set-Up Operators	0	3	1	0	0	4
Spotters, Dry Cleaning	0	3	1	0	0	4
Food Servers, Outside	0	2	1	0	0	3
Vending Machine Attendants	0	2	1	0	0	3
Weed, Disease, and Insect Control Inspectors	0	2	1	0	0	3
Animal Groomers and Bathers	0	1	1	0	0	2
Tire Building Machine Operators	0	1	1	0	0	2
Helpers- Painters, Paperhangers, Plasterers, and Stucco Masons	0	0	1	0	0	1
Home Health Aides	0	0	1	0	0	1
Patient Transporters	0	0	1	0	0	1
Shipping, Receiving, and Traffic Clerks	6	12	2	0	0	20
Guards and Watch Guards	0	7	2	0	0	9
Transportation Attendants, Except Flight Attendants and Baggage Porters	0	7	2	0	0	9
Waiters/Waitresses	0	7	2	0	0	9
Duplicating Machine Operators	0	4	2	0	0	6
Child Care Workers	0	2	2	0	0	4
On-Track Mobile Equipment Operators	0	2	2	0	0	4
Bus Drivers	0	1	2	0	0	3
Child Monitors, Private Household	0	1	2	0	0	3

Table 4. Frequency of DOTs for each Strength Rating: for those DOTs that Match to Occupational Units with a Job Zone=1.

	Strength Rating					Total
	S	L	M	H	V	
Kitchen Helpers	0	1	2	0	0	3
Foundry Mold Assembly and Shakeout Workers	0	0	2	0	0	2
Funeral Attendants	0	0	2	0	0	2
Highway Maintenance Workers	0	0	2	0	0	2
Postal Mail Carriers	0	0	2	0	0	2
Soldering and Brazing Machine Operators and Tenders	1	3	3	0	0	7
Telemarketers, Door-To-Door Sales Workers, News and Street Vendors, and Other Related Workers	1	5	3	0	0	9
Housekeepers, Private Household	0	5	3	0	0	8
Extruding and Forming Machine Operators and Tenders, Synthetic or Glass Fibers	0	4	3	0	0	7
Dining Room and Cafeteria Attendants, and Bartender Helpers	0	1	3	0	0	4
Railroad Yard Workers	0	1	3	0	0	4
Truck Drivers, Light- Including Delivery and Route Workers	1	1	4	0	0	6
Sewers, Hand	1	16	4	0	0	21
Counter and Rental Clerks	1	19	4	0	0	24
Electronic Semiconductor Wafer Etchers and Engravers	0	2	4	0	0	6
Irrigation Workers	0	0	4	0	0	4
Sewing Machine Operators, Non-Garment	3	32	5	0	0	40
Food Preparation Workers	0	8	5	0	0	13
Machine Assemblers	0	5	5	0	0	10
Driver/Sales Workers	0	1	5	0	0	6
Service Station Attendants	0	1	5	0	0	6
Pressing Machine Operators and Tenders- Textile, Garment, and Related Materials	0	26	6	0	0	32
Personal Attendants	0	6	6	0	0	12
Laundry and Drycleaning Machine Operators and Tenders, Except Pressing	0	8	8	0	0	16
Truck Drivers, Heavy	0	1	12	0	0	13
Textile Menders	1	3	0	1	0	5
Sponge and Seaweed Gatherers	0	5	0	1	0	6
Elevator Operators	0	1	0	1	0	2
Air Hammer Operators	0	0	0	1	0	1
Yard Workers, Private Household	0	0	0	1	0	1
Electronic Semiconductor Wafer Breakers, Mounters, and Packagers	2	1	1	1	0	5

Table 4. Frequency of DOTs for each Strength Rating: for those DOTs that Match to Occupational Units with a Job Zone=1.

	Strength Rating					Total
	S	L	M	H	V	
Mail Clerks, Except Mail Machine Operators and Postal Service	0	6	1	1	0	8
Maids and Housekeeping Cleaners	0	1	1	1	0	3
Nursery Workers	0	0	1	1	0	2
Rail-Track Maintenance Workers	0	0	1	1	0	2
Tire Repairers and Changers	0	0	1	1	0	2
Horse Riders/Exercisers	0	0	2	1	0	3
Electronic Components Assemblers	1	7	3	1	0	12
Plastic Molding and Casting Machine Operators and Tenders	0	6	3	1	0	10
Animal Caretakers, except Farm	0	0	3	1	0	4
Baggage Porters and Bellhops	0	0	3	1	0	4
Electrical Components Assemblers	2	17	4	1	0	24
Graders and Sorters, Agricultural Products	0	7	4	1	0	12
Refractory Materials Repairers, Except Brick Masons	0	0	4	1	0	5
Amusement and Recreation Attendants	0	19	5	1	0	25
Industrial Truck and Tractor Operators	0	2	7	1	0	10
Weighers, Measurers, Checkers, and Samplers- Recordkeeping	1	23	8	1	0	33
Textile Draw-Out Machine Operators and Tenders	0	0	8	1	0	9
Product Repairers	1	20	9	1	0	31
Machine Tool Cutting Operators and Tenders, Metal and Plastic	9	66	35	1	0	111
General Farmworkers	0	0	0	2	0	2
Stock Clerks, Sales Floor	0	0	0	2	0	2
Oilers	0	0	3	2	0	5
Metal Pourers and Casters, Basic Shapes	0	0	6	2	0	8
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	0	1	12	2	0	15
Printing Press Machine Operators and Tenders	1	23	14	2	0	40
Meat, Poultry, and Fish Cutters and Trimmers- Hand	0	8	15	2	0	25
Textile Bleaching and Dyeing Machine Operators and Tenders	0	11	26	2	0	39
Tree, Log, and Brush Cutters	0	0	2	3	0	5
Laborers, Landscaping and Groundskeeping	0	1	3	3	0	7
Welders, Production	0	1	3	3	0	7
Cooling and Freezing Equipment Operators and Tenders	0	13	4	3	0	20
Forest and Conservation Workers	0	1	4	3	0	8
Farmworkers, Food and Fiber Crops	0	1	9	3	0	13

Table 4. Frequency of DOTs for each Strength Rating: for those DOTs that Match to Occupational Units with a Job Zone=1.

	Strength Rating					Total
	S	L	M	H	V	
Taxi Drivers and Chauffeurs	0	4	1	0	1	6
Ambulance Drivers and Attendants, Except Emergency Medical Technicians	0	0	1	0	1	2
Conveyor Operators and Tenders	0	12	12	1	1	26
Helpers- Carpenters and Related Workers	0	0	2	3	1	6
Grinding and Polishing Workers, Hand	7	28	23	5	1	64
Log Sorters, Markers, Movers, and Debarkers	0	1	3	6	1	11
Hoist and Winch Operators	0	5	8	9	1	23
Commercial Fishery Workers	0	1	2	11	1	15
Textile Machine Operators and Tenders- Winding, Twisting, Knitting, Weaving, and Cutting	2	62	47	11	1	123
Cutting and Slicing Machine Operators and Tenders	2	72	47	14	1	136
Furnace, Kiln, Oven, Drier, or Kettle Operators and Tenders	0	52	79	15	1	147
Rail-Track Laying and Maintenance Equipment Operators	0	0	1	0	2	3
Helpers- Brick and Stone Masons, and Hard Tile Setters	0	0	0	3	2	5
Cutters and Trimmers, Hand	8	53	20	5	2	88
Freight, Stock, and Material Movers, Hand	1	1	15	21	2	40
Machinery Maintenance Servicicers	0	11	12	5	3	31
Crushing, Grinding, Mixing, and Blending Machine Operators and Tenders	5	118	134	97	3	357
Machine Feeders and Offbearers	3	116	104	64	4	291
Production Laborers	12	166	191	123	7	499
Totals	329	2886	1871	718	40	5844

APPENDIX 3:

DOT Definitions of Work

Table 4. Frequency of DOTs for each Strength Rating: for those DOTs that Match to Occupational Units with a Job Zone=1.

	Strength Rating					Total
	S	L	M	H	V	
Nonelectrolytic Plating and Coating Machine Operators and Tenders, Metal and Plastic	0	12	16	3	0	31
Cleaning, Washing, and Pickling Equipment Operators and Tenders	1	20	19	3	0	43
Hand Painting, Coating, or Decorating Workers	18	44	29	3	0	94
Helpers- Extractive Workers	0	1	3	5	0	9
Farmworkers, Farm and Ranch Animals	0	5	13	5	0	23
Cementing and Gluing Machine Operators and Tenders	0	33	18	5	0	56
Coating, Painting, and Spraying Machine Operators and Tenders	1	31	33	5	0	70
Fallers and Buckers	0	0	0	6	0	6
Metal Molding, Coremaking, and Casting Machine Operators and Tenders	0	2	14	6	0	22
Woodworking Machine Operators and Tenders, Except Sawing	0	36	47	6	0	89
Cooking Machine Operators and Tenders, Food and Tobacco	0	15	17	9	0	41
Roasting, Baking, and Drying Machine Operators and Tenders, Food and Tobacco	0	22	12	10	0	44
Packers and Packagers, Hand	2	29	18	10	0	59
Packaging and Filling Machine Operators and Tenders	1	44	19	10	0	74
Machine Forming Operators and Tenders, Metal and Plastic	4	24	34	10	0	72
Vehicle Washers and Equipment Cleaners	0	11	34	12	0	57
Production Inspectors, Testers, Graders, Sorters, Samplers, Weighers	56	508	77	13	0	654
Production Helpers	0	9	30	14	0	53
Extruding, Forming, Pressing, and Compacting Machine Operators and Tenders	1	67	64	15	0	147
Elemental Hand Workers	30	168	78	22	0	298
Helpers- Mechanics and Repairers	0	2	22	25	0	49
Separating, Filtering, Clarifying, Precipitating, and Still Machine Operators and Tenders	0	136	87	28	0	251
Assemblers and Fabricators- Except Machine, Electrical, Electronic, and Precision	49	237	138	41	0	465
Choke Setters	0	0	0	0	1	1
Refuse and Recyclable Material Collectors	0	0	0	0	1	1
Stevedores, Except Equipment Operators	0	0	0	0	1	1
General Office Clerks	37	29	1	0	1	68

CHAPTER 2

CONCEPTS AND PRINCIPLES OF JOB ANALYSIS

In modern usage, the word "job" has different meanings depending on how, when, or by whom it is used. Moreover, "job" is often used interchangeably with the words "occupation", "position", and "task". To eliminate this confusion and to clarify terms, the United States Employment Service (USES) developed definitions for the following terms for use in job analysis:

1. An **Element** is the smallest step into which it is practical to subdivide any work activity without analyzing separate motions, movements, and mental processes involved.
2. A **Task** is one or more elements and is one of the distinct activities that constitute logical and necessary steps in the performance of work by the worker. A task is created whenever human effort, physical or mental, is exerted to accomplish a specific purpose.
3. A **Position** is a collection of tasks constituting the total work assignment of a single worker. There are as many positions as there are workers in the country.
4. A **Job** is a group of positions within an establishment¹ which are identical with respect to their major or significant tasks and sufficiently alike to justify their being covered by a single analysis. There may be one or many persons employed in the same job.
5. An **Occupation** is a group of jobs, found at more than one establishment, in which a common set of tasks are performed or are related in terms of similar objectives, methodologies, materials, products, worker actions, or worker characteristics.

Element, task, and job are relative concepts; an activity that is an element in one job could be a task in another job, and could be a job in and of itself for a third worker. The following example illustrates this point. "Slices cold meats and cheese" is an element in the job of a Short Order Cook, a task in the job of a Sandwich Maker, and the total job of a Deli Cutter-Slicer.

Job, Task, and Element as Relative Concepts

JOB TITLE	SHORT ORDER COOK	SANDWICH MAKER	DELICUTTER-SLICER
JOB	Prepares and cooks, to order, food requiring short preparation time	Prepares sandwiches	Slices cold meats and cheese by hand or machine
TASK	Prepares sandwiches	Slices cold meats and cheese by hand or machine	
ELEMENT	Slices cold meats and cheese by hand or machine		

DETERMINING JOB LIMITS

In the analysis of jobs it is necessary to determine where jobs begin and where they end. The analyst must be able to analyze a group of positions, determine the number of jobs existing among the positions, and then determine the exact nature of these jobs.

Jobs must be analyzed as they exist; therefore, each completed Job Analysis Report (JAR) must report the job as it exists at the time of the analysis, not as it should exist, not as it has existed in the past, and not as it exists in similar establishments.

¹Establishment: A public or private employing unit that produces, provides, and/or sells goods or services at a single, physical location. An establishment may range in size from a single, self-employed worker to thousands of workers.

APPENDIX 4:

First Look at a Crosswalk of the Constructs of the DOT Strength Measure to O*NET Variables

(Appendix 4 is intended to supplement discussion under *Concern 1: O*NET Content Model* on page 12 of the 5/7/99 draft entitled "**First Findings on O*NET Adequacy and Appropriateness For SSA's Disability Decisionmaking Process.**" The information and variable choices described herein are the author's opinion only, and are not intended to represent SSA or DOL policy.)

Discussion:

In order to provide context, or a point of reference to discussions of the adequacy and appropriateness of the O*NET content model, this appendix begins with the DOT strength measure, and the conceptual framework used by job analysts to assign occupations a strength rating. The first table contains the rating criteria for the DOT strength measure, based upon the construct of the measure. Analysts rate strength based upon three constructs:

Body position: including standing walking and sitting;

Weight/force: including lifting pushing, pulling and carrying; and,

Controls: Hand-arm and Leg-foot.

The first table shows the level of each variable for ratings from sedentary to very heavy. It can be noted that body position and controls receive less consideration as the strength requirements (weight and force) increase.

The second table is a naive look at a potential DOT/O*NET crosswalk for the DOT strength measure currently used by SSA in disability decisionmaking. For each DOT construct roughly analogous O*NET variables are identified. There is neither a direct nor a one-to-one mapping. Some identified O*NET variables go beyond the current DOT constructs. Some DOT measures, such as frequency, are absent from O*NET and replaced by other measures such as "importance." However, these variables may represent a starting point for evaluating the O*NET content model and for possible variable reduction strategies. **Warning: the adequacy and/or appropriateness of the content model will not, in itself, resolve problems with the clustering of occupations or data collection.**

Following the crosswalk table are descriptions of the chosen O*NET variables as provided in Volume II: O*NET Appendices.

Rating for DOT Strength Variable

Constraint (elements)

Sedentary Rating:

Light Rating:

Medium Rating:

Heavy Rating:

Very Heavy Rating:

A. Body Position

Standing
Level:
Frequency:

brief periods
occasionally

to a significant degree

Walking
Level:
Frequency:

brief periods
occasionally

to a significant degree

Sitting
Level:
Frequency:

posture may
differentiate
sedentary/light

most of the time;
constantly

working at a production
rate while constantly
pushing or pulling
materials of negligible
weight or the time; posture
most of the time; posture
may differentiate
sedentary/light

**B. Weight/force
(As demonstrated by duration
and intensity of lifting, carrying,
pushing, and/or pulling)**

Level:
Frequency:

up to 10 lbs of force
occasionally

up to 20 lbs of force
occasionally

or
Level:
Frequency:

negligible force
frequently

up to 10 lbs of force
frequently

or
Level:
Frequency:

negligible force
constantly

negligible force
constantly

20 to 50 lbs of force
occasionally
or
10 to 25 lbs of force
frequently
or
negligible force
constantly

50 to 100 lbs of force
occasionally
or
25 to 50 lbs of force
frequently
or
10 to 20 lbs of force
constantly

100 lbs or more of force
occasionally
or
50 lbs or more of force
frequently
or
20 lbs or more of force
constantly

**C. Controls Hand-Arm and Leg-Foot
(controls include buttons, knobs,
pedals, levers, and cranks)**

One or both arms to move controls
Level:
Frequency:

Level:

Frequency:

Rate may
differentiate
sedentary/light

working at a production
rate while constantly
pushing or pulling
materials of negligible
weight
constantly

First Look at a Crosswalk of the Constructs of the DOT Strength Measure to O*NET Variables

DOT Construct

O*NET Variables

A. Body Position

Standing

Work context 22b. How much time in a usual work period does the worker spend *standing*?

Walking

Work context 22d. How much time in a usual work period does the worker spend *walking or running*?

Sitting

Work context 22a. How much time in a usual work period does the worker spend *sitting*?

B. Weight/force

(NOTE: There is no frequency measure in O*NET, instead O*NET obtains an importance measure)

Lifting
Carrying
Pushing
Pulling

Abilities 32. *Static strength*: The ability to exert maximum muscle force to lift, push, pull or carry objects

Ability 34. *Dynamic strength*: The ability to exert muscle force repeatedly or continuously over time. This involves muscular endurance and resistance to muscle fatigue.

Ability 36. *Stamina*: The ability to exert one's self physically over long periods of time without getting winded or out of breath.

DOT Construct

B. Weight/Force con't.

C. Controls Hand-Arm and
Leg-Foot (controls include
buttons, knobs, pedals, levers,
and cranks)
One or both arms to move controls
One or both legs to move controls

O*NET Variables

Ability 35. *Trunk strength*: The ability to use one's abdominal and lower back muscles to support part of the body repeatedly or continuously over time without "giving out" or fatiguing.

Ability 33. *Explosive strength*: The ability to use short bursts of Muscle force to propel oneself or to throw an object.

Ability 25. *Control Precision*: The ability to quickly and repeatedly make precise adjustments in moving the controls of a machine or vehicle to exact positions

Ability 37. *Extent Flexibility*: The ability to bend, stretch, twist, or reach out with body, arms, and/or legs.

Ability 23. *Manual Dexterity*: The ability to quickly make coordinated movements of one hand, a hand together with an arm, or two hands to grasp , manipulate, or assemble objects.

Ability 22. *Arm-Hand Steadiness*: The ability to keep the hand and arm steady while making an arm movement or while holding the arm and hand in one position.

DOT Construct

C. Control con't.

O*NET Variables

Ability 30. *Arm-Hand Steadiness*: The ability to make fast, simple, repeated movements of the fingers, hands, and wrists.

Ability 26. *Multilimb Coordination*: The ability to coordinate movements of two or more limbs (for example, two arms, two legs, or one arm and one leg) while sitting, standing or lying down. It does not involve performing the activities while the body is in motion.

(O*NET variables listed below are less related to Control)

Ability 31. *Speed of Limb Movement*: The ability to quickly move the arms or legs.

Ability 38. *Dynamic Flexibility*: The ability to quickly and repeatedly bend, stretch, twist, or reach out with the body, arms, and/or legs.

Ability 39. *Gross Body Coordination*: The ability to coordinate the movement of the arms, legs, and torso together in activities where the whole body is in motion.

Ability 40. *Gross Body Equilibrium*: The ability to keep or regain one's body balance or to stay upright when in an unstable position.

Work Context: Physical Work Conditions: Body Positioning

22. Body Positioning

How much time in a usual work period does the worker spend:

a. Sitting?

Never (or does not apply)	Under 1/10 of the time	Between 1/10 and 1/3 of the time	Between 1/3 and 2/3 of the time	Over 2/3 of the time	Almost continually
①	①	②	③	④	⑤

b. Standing?

Never (or does not apply)	Under 1/10 of the time	Between 1/10 and 1/3 of the time	Between 1/3 and 2/3 of the time	Over 2/3 of the time	Almost continually
①	①	②	③	④	⑤

c. Climbing ladders, scaffolds, poles, etc.?

Never (or does not apply)	Under 1/10 of the time	Between 1/10 and 1/3 of the time	Between 1/3 and 2/3 of the time	Over 2/3 of the time	Almost continually
①	①	②	③	④	⑤

d. Walking or running?

Never (or does not apply)	Under 1/10 of the time	Between 1/10 and 1/3 of the time	Between 1/3 and 2/3 of the time	Over 2/3 of the time	Almost continually
①	①	②	③	④	⑤

22. Body Positioning (continued)

How much time in a usual work period does the worker spend:

e. Kneeling, crouching, stooping, or crawling?

Never (or does not apply)	Under 1/10 of the time	Between 1/10 and 1/3 of the time	Between 1/3 and 2/3 of the time	Over 2/3 of the time	Almost continually
①	②	③	④	⑤	⑥

f. Keeping or regaining balance?

Never (or does not apply)	Under 1/10 of the time	Between 1/10 and 1/3 of the time	Between 1/3 and 2/3 of the time	Over 2/3 of the time	Almost continually
①	②	③	④	⑤	⑥

g. Using hands to handle, control, or feel objects, tools or controls?

Never (or does not apply)	Under 1/10 of the time	Between 1/10 and 1/3 of the time	Between 1/3 and 2/3 of the time	Over 2/3 of the time	Almost continually
①	②	③	④	⑤	⑥

h. Bending or twisting the body?

Never (or does not apply)	Under 1/10 of the time	Between 1/10 and 1/3 of the time	Between 1/3 and 2/3 of the time	Over 2/3 of the time	Almost continually
①	②	③	④	⑤	⑥

22. Body Positioning (continued)

How much time in a usual work period does the worker spend:

i. Making repetitive motions?

Never (or does not apply)	Under 1/10 of the time	Between 1/10 and 1/3 of the time	Between 1/3 and 2/3 of the time	Over 2/3 of the time	Almost continually
①	②	③	④	⑤	⑥

32. Static Strength

The ability to exert maximum muscle force to lift, push, pull, or carry objects.

Level

What level of this ability is needed to perform this job?

Requires use of all the muscle force possible to lift, carry, push, or pull a very heavy object.

⑦

⑥

⑤

④

③

②

①

NR

Not relevant at all for performance on this job

← *Lifting 75-pound bags of cement onto a truck.*

← *Pulling a 40-pound sack of fertilizer across the lawn.*

← *Pushing an empty shopping cart.*

Requires use of a little muscle force to lift, carry, push, or pull a light object.

Importance

How important is this ability to performance on this job?

Not Important

Somewhat Important

Important

Very Important

Extremely Important

①

②

③

④

⑤

34. Dynamic Strength

The ability to exert muscle force repeatedly or continuously over time. This involves muscular endurance and resistance to muscle fatigue.

Level

What level of this ability is needed to perform this job?

Requires use of all the muscle force possible to hold up or move the body weight or objects for a long period of time.

Requires use of a little muscle force to hold up or move the body weight or objects for a short time.



← Performing a gymnastics routine using the rings.

← Climbing a 48-foot long extension ladder.

← Using pruning shears to trim a bush.

NR Not relevant at all for performance on this job

Importance

How important is this ability to performance on this job?

Not Important

Somewhat Important

Important

Very Important

Extremely Important

①

②

③

④

⑤

36. Stamina

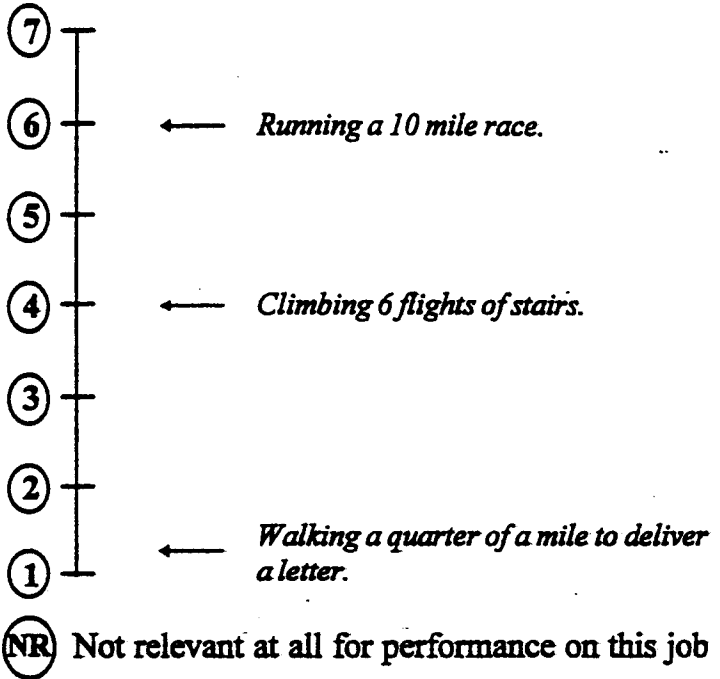
The ability to exert one's self physically over long periods of time without getting winded or out of breath.

Level

What level of this ability is needed to perform this job?

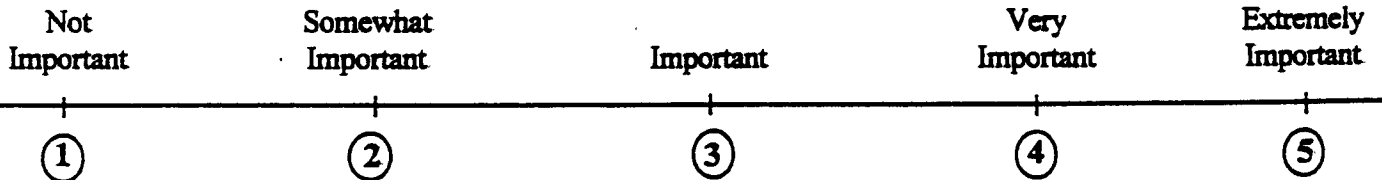
Requires physical activity of the whole body over a long time, with great strain on the heart and lungs.

Requires physical activity of the whole body over a short time, with little strain on the heart and lungs.



Importance

How important is this ability to performance on this job?



35. Trunk Strength

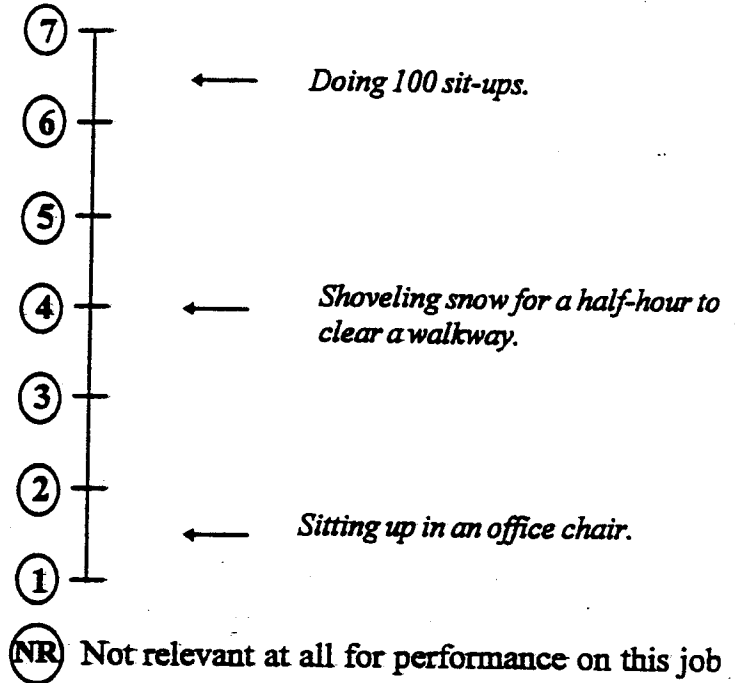
The ability to use one's abdominal and lower back muscles to support part of the body repeatedly or continuously over time without "giving out" or fatiguing.

Level

What level of this ability is needed to perform this job?

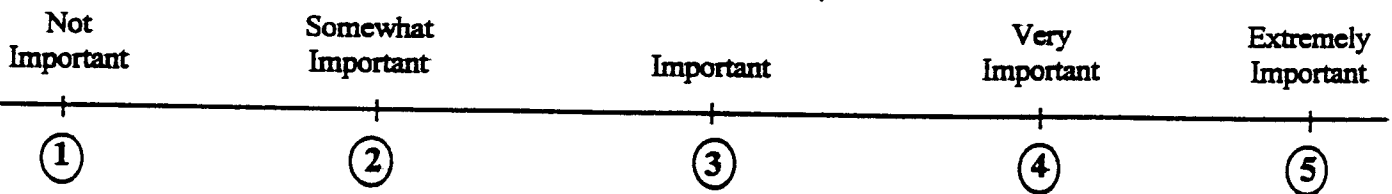
Requires use of all the abdominal and lower back muscle force possible to hold up or move part of the body for a long period of time.

Requires use of a little abdominal and lower back muscle force to hold up or move part of the body for a short time.



Importance

How important is this ability to performance on this job?



33. Explosive Strength

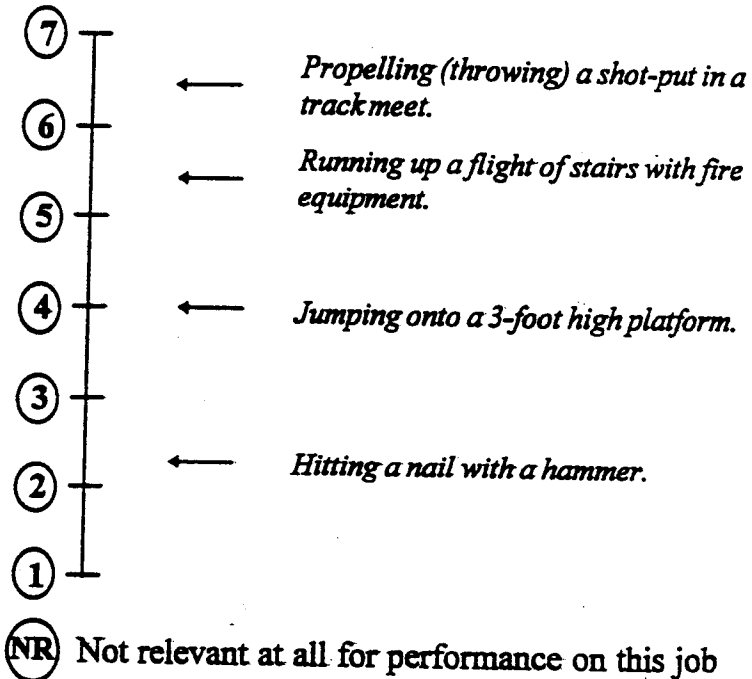
The ability to use short bursts of muscle force to propel oneself (as in jumping or sprinting), or to throw an object.

Level

What level of this ability is needed to perform this job?

Requires bursts of all the muscle force possible to propel one's own body weight or objects.

Requires bursts of a little muscle force to move one's own body weight or objects.



Importance

How important is this ability to performance on this job?

Not Important

Somewhat Important

Important

Very Important

Extremely Important

①

②

③

④

⑤

25. Control Precision

The ability to quickly and repeatedly make precise adjustments in moving the controls of a machine or vehicle to exact positions.

Level

What level of this ability is needed to perform this job?

Requires extreme precision to quickly and repeatedly adjust very sensitive controls.

(7)

(6)

(5)

(4)

(3)

(2)

(1)

(NR)

← *Drilling a tooth.*

← *Adjusting farm tractor controls.*

← *Adjusting a room light with a dimmer switch.*

(NR) Not relevant at all for performance on this job

Importance

How important is this ability to performance on this job?

Not Important

Somewhat Important

Important

Very Important

Extremely Important

(1)

(2)

(3)

(4)

(5)

37. Extent Flexibility

The ability to bend, stretch, twist, or reach out with the body, arms, and/or legs.

Level

What level of this ability is needed to perform this job?

Requires a high degree of bending, stretching, twisting, or reaching out into unusual positions.

Requires a low degree of bending, stretching, twisting, or reaching out.

- 7
- 6
- 5
- 4
- 3
- 2
- 1
- NR

← Working under a car dashboard to repair the heater.

← Reaching for a box on a high warehouse shelf.

← Reaching for a microphone in a patrol car.

NR Not relevant at all for performance on this job

Importance

How important is this ability to performance on this job?

Not Important

Somewhat Important

Important

Very Important

Extremely Important

1

2

3

4

5

23. Manual Dexterity

The ability to quickly make coordinated movements of one hand, a hand together with the arm, or two hands to grasp, manipulate, or assemble objects.

Level

What level of this ability is needed to perform this job?

Requires very fast coordinated use of one hand, a hand and arms, or two hands to grasp, place, move, or assemble objects.

Requires some speed and coordination to grasp, place, move, or assemble objects with one hand, a hand and arm, or two hands.

⑦

⑥

⑤

④

③

②

①

NR

← Performing open-heart surgery using surgical instruments.

← Packaging oranges in crates as quickly as possible.

← Screwing a light bulb into a lamp socket.

Not relevant at all for performance on this job

Importance

How important is this ability to performance on this job?

Not Important

Somewhat Important

Important

Very Important

Extremely Important

①

②

③

④

⑤

22. Arm-Hand Steadiness

The ability to keep the hand and arm steady while making an arm movement or while holding the arm and hand in one position.

Level

What level of this ability is needed to perform this job?

Requires extreme steadiness to move the arm and hand or to hold them in position.

Requires only a little steadiness to move the arm and hand or to hold them in one position.

⑦

⑥

⑤

④

③

②

①

NR

Not relevant at all for performance on this job

← *Cutting facets in diamonds.*

← *Threading a needle.*

← *Lighting a candle.*

Importance

How important is this ability to performance on this job?

Not Important

Somewhat Important

Important

Very Important

Extremely Important

①

②

③

④

⑤

30. Wrist-Finger Speed

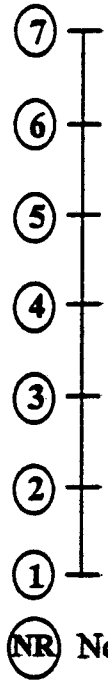
The ability to make *fast, simple, repeated movements* of the *fingers, hands, and wrists*.

Level

What level of this ability is needed to perform this job?

Requires movements of the fingers, hands, and wrists at an extremely fast pace.

Requires movement of the fingers, hands, and wrists at a slow pace.



- ← Typing a document at the speed of 90 words per minute.
- ← Carving roast beef in a cafeteria.
- ← Using a manual pencil sharpener.

NR Not relevant at all for performance on this job

Importance

How important is this ability to performance on this job?

Not Important

Somewhat Important

Important

Very Important

Extremely Important

①

②

③

④

⑤

26. Multilimb Coordination

The ability to coordinate movements of two or more limbs together (for example, two arms, two legs, or one leg and one arm) while sitting, standing, or lying down. It does not involve performing the activities while the body is in motion.

Level

What level of this ability is needed to perform this job?

Requires a high degree of coordination to perform very complex movements involving the use of all four limbs together.

Requires a low degree of coordination to perform simple movements using two limbs at a time.

⑦

⑥

← *Playing the drum set in a jazz band.*

⑤

④

← *Operating a forklift truck in a warehouse.*

③

← *Rowing a boat.*

②

①

Ⓝ Not relevant at all for performance on this job

Importance

How important is this ability to performance on this job?

Not
Important

Somewhat
Important

Important

Very
Important

Extremely
Important

①

②

③

④

⑤

31. Speed of Limb Movement

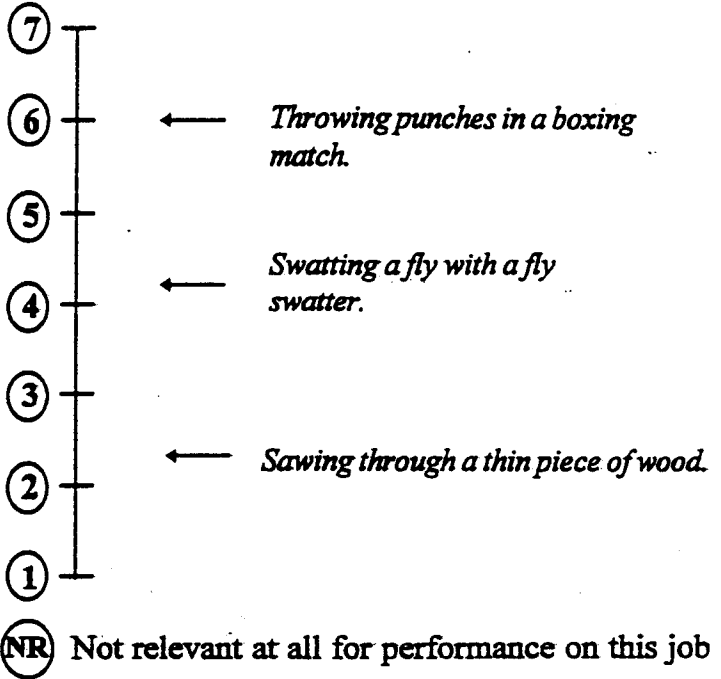
The ability to *quickly* move the arms or legs.

Level

What level of this ability is needed to perform this job?

Requires very fast movements of the arms or legs when little time is allowed to complete the movement.

Requires movement of the arms or legs when a fairly long time is allowed to complete the movement.



Importance

How important is this ability to performance on this job?

Not Important

Somewhat Important

Important

Very Important

Extremely Important

①

②

③

④

⑤

38. Dynamic Flexibility

The ability to quickly and repeatedly bend, stretch, twist, or reach out with the body, arms, and/or legs.

Level

What level of this ability is needed to perform this job?

Requires many fast and repeated body bending, twisting, or stretching movements.

Requires a few repeated bending, twisting, or stretching movements in which speed is not important.



← *Maneuvering a kayak through swift rapids.*

← *Performing a dance routine as part of a cheerleading squad.*

← *Hand picking a bushel of apples from a tree.*

NR Not relevant at all for performance on this job

Importance

How important is this ability to performance on this job?

Not Important

Somewhat Important

Important

Very Important

Extremely Important

①

②

③

④

⑤

39. Gross Body Coordination

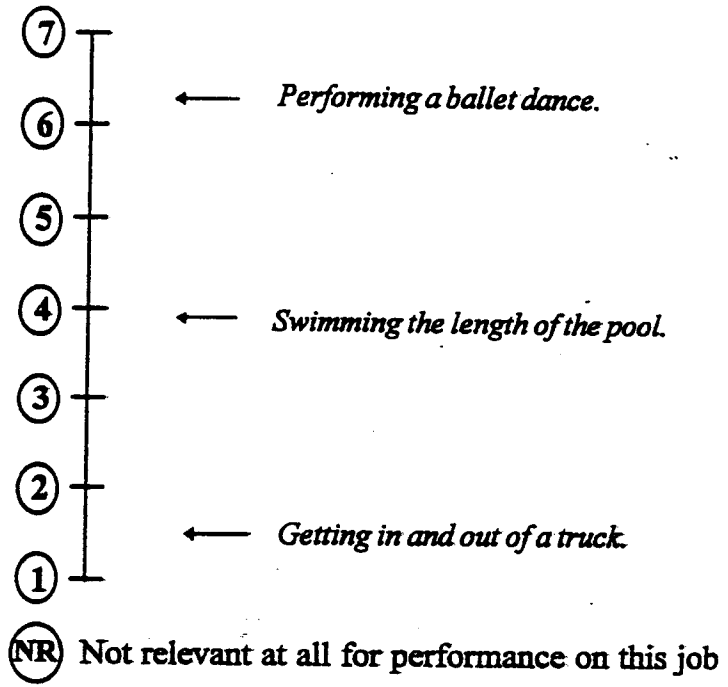
The ability to coordinate the *movement of the arms, legs, and torso together* in activities where the whole body is in motion.

Level

What level of this ability is needed to perform this job?

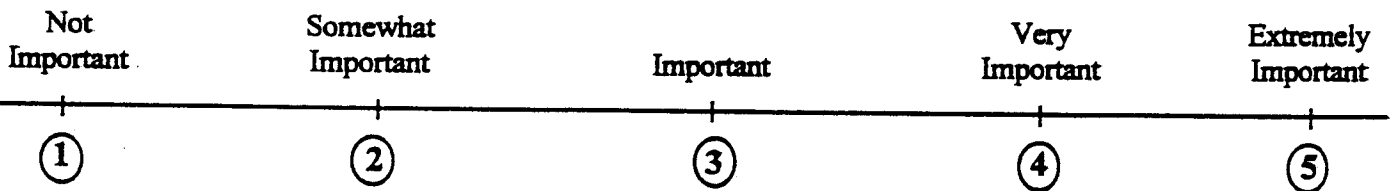
Requires a high degree of overall body coordination to do difficult sets of movements.

Requires a small degree of overall body coordination to do simple common movements.



Importance

How important is this ability to performance on this job?



40. Gross Body Equilibrium

The ability to keep or regain one's body balance or stay upright when in an unstable position.

Level

What level of this ability is needed to perform this job?

Requires keeping or getting back body balance when many forces are working against keeping body balance.

Requires keeping or getting back balance when a fairly weak force is working against keeping body balance.

7

6

5

4

3

2

1

NR

Not relevant at all for performance on this job

← *Walking on narrow beams in high-rise construction.*

← *Walking on ice across a pond.*

← *Standing on a ladder.*

Importance

How important is this ability to performance on this job?

Not Important

Somewhat Important

Important

Very Important

Extremely Important

1

2

3

4

5