

DEVELOPMENT OF A CONVERTIBILITY LIST BETWEEN THE DOT AND CENSUS CLASSIFICATION SYSTEMS

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The Convertibility List of Occupations published by the Bureau of the Budget in 1940 related the occupational classification structure used in the 1940 Census of Population with that in the first (1939) edition of the Department of Labor's Dictionary of Occupational Titles. The third edition of the Dictionary of Occupational Titles, published December 1965, represents a basic change in the structure of occupational classification. It is not merely an updating of the original classification system in the Dictionary. The old Convertibility List, therefore, is no longer usable in connection with it. Since a number of Federal agencies and a number of non-government organizations use both the Census and DOT classifications in developing and presenting manpower data, it is essential that a new Convertibility List be developed.

The third edition of the Dictionary of Occupational Titles contains the most comprehensive information about occupations and their worker traits requirements developed to date. For the first time we have identified, defined and classified jobs not only in terms of the traditional tasks performed, but also in terms of requirements made on the workers. For every job in the Dictionary we have obtained not only information about the nature of the work performed; the materials, products, subject matter, and services involved; and the machines, tools, and equipment used; but also identification of the specific functions performed by the worker; the significant aptitudes, interests, and temperaments involved; the critical physical demands and working conditions; and the training time required. We are now in the process of developing a convertibility table between the DOT and the Census classification systems to permit relating this information about occupations to numbers of people in the work force.

More specifically, we have the following new items of information for each defined job in the DOT:

Classification of the job in terms of 23 worker functions related to data, to people, and to things. Examples of these functions are "analyzing," "computing," "supervising," and machine "tending."

The degree required, on a 5-point scale, of each of 11 aptitudes. These include the 9 aptitudes of the U.S. Employment Service's General Aptitude Test Battery, plus two additional aptitudes, eye-hand-foot coordination and color discrimination.

Selection of those interests significant in the job from a list of 10 factors.

An indication on a 5-point scale of the degree of strength required, and a selection of

other critical physical demands from a list of 5 factors.

An indication of whether the job involves working inside or outside, and a selection of other critical working conditions from a list of 6 factors.

An indication of the degree of general educational development required from a 6-point scale of reasoning, mathematical, and language development.

An indication of the specific vocational preparation required on a 9-point scale of months and years.

Although this information is available about occupations, it has not yet been related to numbers of workers. The Bureau of the Census provides information about the occupational distribution of the work force. By relating these two classification systems, these two kinds of information could be brought together. This would be an important step in providing information on the supply side of the labor force equation.

For example, we know the general educational development level required for a worker to perform in each occupation. If we can relate this to the number of workers employed in each occupation, we could develop a distribution of the minimum general educational development levels of the American work force as demonstrated by the requirements of the occupations they hold. Similarly, by determining the distribution of all of the worker traits factors, a worker traits profile of the working population could be developed. This could be a milestone in such manpower planning activities as facilitating utilization of available skills in the work force.

Two approaches are being undertaken to develop this convertibility table: (1) Assignment of DOT classifications to all job titles in the Census Classified Index of Occupations and Industries, and (2) Assignment of DOT classifications to several thousand Current Population Survey household returns.

The first approach involves dividing the 296 Census 3-digit occupational categories among seven occupational analysts. Their assignment is to identify for each Census job title, in a specific industry, the DOT title and code to which it probably converts. The term "probably" is used because Census titles are not defined and conversion depends on the analysts' judgments based on available data. A high degree of similarity exists between Census categories and DOT 3-digit groups with respect to professional, clerical, sales, service, agricultural, and

craft occupations. We do not expect conversion in these categories to be difficult. However, there is little similarity between Census categories and DOT groups with regard to the bulk of industrial occupations and most of the conversion problems occur among the industrial occupations. Of the 296 Census categories, preliminary conversion to DOT titles and codes has been completed for 111 categories containing almost 5,000 of the 24,000 Census job titles.

About 27% of these Census conversions presented problems. Most of these problems stem from ambiguity resulting from the lack of definition of the Census title in terms of specific job duties. In about 10% of the cases conversions were attempted but it was indicated that some doubt remained about the adequacy of the conversion. An example is the conversion of the Census title "Heavy-Equipment Operator" to the DOT title "Operating Engineer." About 9% of the Census titles could be converted to several DOT titles and codes so that no single conversion could be made. For example, the Census title "Graduate Nurse" converts to most titles in the DOT 3-digit group "Registered Nurses." However, there is no problem in converting from a title in one system to a classification group in the other system. For about 8% of the Census titles, no equivalent DOT title and code could be located. Examples are "Acid Painter" in the Glass and Glass Products industry; and "City Employee."

It is estimated that about 15% of the conversions will present problems requiring resolution by a joint Census-USES team of experts at the conclusion of the preliminary conversions by the seven occupational analysts.

The second approach is that of classifying several thousand Current Population Survey household returns. About 50,000 returns from one month's survey are available for this study. 4,919 entries have been coded so far. Only 6% of this number have presented classification problems. The most common problems involve either insufficient information to relate the job to any DOT classification, or a job that could convert to too many DOT classifications. Examples of this latter problem would include Truck Driver, where the DOT distinguishes between drivers of light and heavy trucks; Dishwasher, where the DOT distinguishes between hand and machine dishwashing; and Farmer, where the DOT distinguishes among different types of farming at the 2-digit classification level.

The distribution of the 4,919 returns classified to date indicates that we probably already have a sufficient sample for this study. These returns are distributed throughout 80 of the 83 2-digit divisions in the DOT and represents about two-thirds of the 603 3-digit groups. The next step will be an analysis of the data classified in order to evaluate the meaningfulness of the data resulting from using the type of occupational structure embodied in the DOT for Census and Current Population Survey returns. There is also under consideration the possibility

of classifying the 1970 Census of Population returns in terms of the DOT system so that a complete convertibility list between the DOT and the 1970 Census could be produced by machine.

A proposal has been made to ask a few large-scale establishments to attempt to code their work forces by the new DOT classification system. Interest has been expressed by several employer associations in the establishment of a general occupational classification scheme that could be utilized for their own statistical purposes, and it is hoped that perhaps from among these some volunteers may be obtained. Such an undertaking would be useful from a number of viewpoints: establishment evaluation of the new DOT classification structure would be very valuable; experiments with having establishments code their employees by a standard occupational scheme, rather than merely return occupational descriptions to be coded by a central agency, would have implications for the development of any large-scale system of collecting occupational data in this way; the success with which establishments can convert their own occupational designations to a standard classification would be an indicator of the feasibility of developing a U.S. Standard Occupational Classification System.

We are also concerned with the relationship between the International Standard Classification of Occupations as developed by the International Labour Office and the classification systems used in the United States. A review of the tentative revision of the ISCO leads us to believe that its comparability with the new DOT classification system is very high. Similarities appearing for the first time include: (1) The expansion of the professional and technical area, (2) The more functional classification of clerical occupations with a distinction between machine and non-machine related jobs, (3) The classification of industrial occupations in such categories as "processing" and "structural work," and (4) The classification of first-line supervisors in the same group as those supervised. At the 3-digit level even the language of the group titles is much closer to that of the third edition DOT than was the case with the 1949 DOT and the 1958 ISCO.

The development of a convertibility list between the ISCO and the DOT will be a less complex task as compared with that between the DOT and the Census system. For the most part, it will be possible to relate the two systems on the basis of equivalent groups, with relatively little necessity to go to the individual occupation before a conversion can be made.

The Interagency Committee on Occupational Classification of the U.S. Bureau of the Budget plans as one of its long range objectives to investigate the possibility of establishing a Standard Occupational Classification, analogous to the Standard Industrial Classification, and to establish such a system if it appears

possible. It is interesting to note that a Standard Occupational Classification was one of the original objectives of the committee when it was first instituted over 25 years ago, and that it was never able to establish this although the development of the original Convertibility List was a first step in that direction. Today, the development of such a system appears more

feasible than at any time in the past. The existing comparability between the DOT and ISCO systems, the development of a Convertibility List between the DOT and Census systems, and the interest of employer associations are all leading in the direction of such a Standard Occupational Classification System.