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THE UNIVERSITY OF ALBERTA

RESTRUCTURE OF
OCCUPATIONAL DATA ANALYSIS
IN
THE ALBERTA ADULT BASIC SKILLS STUDY

by

GARY KIRK

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

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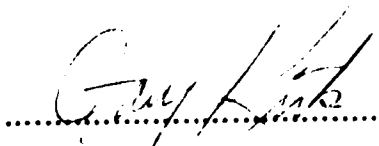

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submitted by Gary Karl Kirk

in partial fulfilment of the requirements for the degree of

Master of Education

in Vocational Education.

A K Deane

Supervisor

Date: January 27, 1989

Dedication

This Thesis is dedicated to

Karl and Ida Kirk,

in anticipation of their golden wedding anniversary--

March 23, 1992.

Abstract

The Alberta Adult Basic Skills (ABS) Study grew out of a joint effort begun in 1981 by Alberta Advanced Education and Manpower, and the Department of Industrial and Vocational Education (University of Alberta). Resources and personnel from five Alberta Vocational Centres were involved in the production of a *Profile of Competencies Needed for Adult Living*, which attempted to catalog a set of functional life skills required by adults in a contemporary Alberta society. The current (1989) ABS Study, initiated by Professor A. K. Deane at the University of Alberta in 1985, began the process of verifying general public acceptance of the importance of the 84 *Adult Basic Skills* (*Competencies*, renamed) contained in a revised *Profile*. The verification process involved surveying (questionnaire and interview) a random sampling (818 participants) of the Edmonton, Alberta adult population. Sampling groups (based on three major independent variables--*Occupation*, *Education*, and *Community*) were compared on their evaluations of the Adult Basic Skills. This thesis research is concerned with the Occupation variable, and its related data coding, grouping, and analysis.

The writer, a researcher with the ABS Study since 1986, was responsible for the majority (90%) of the Occupation coding (respondent classification), and became aware of seeming inconsistencies in the Occupation data grouping procedures employed. In particular, the Study's three General Vocation categories (White, Grey, and Blue collar) appeared to overlap each other in some memberships. The validity of the Study's finding of no significant difference (at the .05 level) amongst the Skill evaluations of the three General Vocation categories was, therefore, brought into question by the writer. A subsequent review, and screening, of the three ABS General

Vocation categories led to a re-analysis of the Occupation data, and formed the basis for the thesis research

The General Vocation categories screening procedure resulted in approximately 50% of the Study's respondents being accepted for the data re-analysis. As well, only 6 of the total 84 Adult Basic Skills were involved in the group comparisons of the thesis research. The intent of the writer was to compare evaluations of the Skills most likely to be influenced by occupational involvement, and least likely to be correlated with each other (according to the writer's own judgment). ANOVA was used to test for mean evaluation differences amongst the Occupational groups, and significance was then tested with a Scheffe multiple comparison procedure, at the .05 level.

In a duplication of the ABS Study's post hoc pairwise comparison procedures, but while using the screened General Vocation categories, the thesis results showed disagreement with the Study's findings in one of the six Basic Skills being compared. The Blue collar General Vocation category rated Skill H-6 (Write To Express An Idea or Convey Information) significantly lower than all other Occupational groups, except for the Unemployed. Overall (main effect) differences, however, were found in three of the six Skills. Main effect differences were not a concern of the ABS Study, though, and this finding was viewed as more an interesting development than a contradiction of the Study's results. A second data grouping procedure also resulted in main effect significance for three of the six Skills, but no post hoc pairwise significance. The writer suggests that a predetermined pairwise comparison approach (as opposed to the ABS Study's post hoc approach) might yield further information on the significance of the evaluation comparisons indicated in the main effect results of the thesis research.

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CHAPTER PAGE

I. Problem

Introduction

The education of adults is a quickly expanding field in most of the developed countries of the world. Canada, in particular, has experienced increased adult education needs, since it has a larger percentage of older citizens than most other countries (Ray, 1983). The education concerns generated by an aging population are intensified by the on-going shift in Canadian society from an industrial to an informational emphasis. Canada, of course, is not unique in this societal shift towards information dependency, nor in the resultant increased demands on education. As Radcliffe (1983) points out, the transformation from an industrial-based society to an information-based society makes it necessary for countries to adjust their educational priorities. He asserts the need for public education to encompass not only the training of productive technicians entering the job market, but also the maintenance of informed citizens--at all age levels--to assure a more equitable opportunity for involvement on the part of those whose initial education may be outdated, incomplete, or irrelevant.

The traditional public school age grouping, approximately 5-18 years of age, has always been, and continues to be, the major focus of educational efforts. However, the adult age groupings, containing people over 18 years of age, are rapidly gaining attention as necessary concerns for public education. The need, according to Godbey (1978), is to recognize that adult education should be an integral part of public education. Several factors support his contention. Firstly, there are

simply more adults. As life expectancies extend, a greater portion of society is found in the adult age groupings. Simply put, modern societies are aging. Pitman (1984) has characterized this demographic change as "slow in developing but ... inexorable and nonreversible" (p. 208).

A second factor in the increased demand for adult education results from increased life expectancies combined with the trend toward earlier retirement options. Whereas, in the past, retirement usually meant an exit from society's vocational mainstream, today it often means the opportunity for starting another career. These new careers are quite likely to require a re-education for, and re-orientation to, societal expectations and workplace demands. Both Ray (1983) and Radcliffe (1983) point out the inevitability of increased adult retraining and upgrading needs.

The rapidly evolving nature of modern society itself provides a third causal factor for increased adult education requirements. In the not-too-distant past, a person might realistically expect to train for a lifetime career, with no need to consider any major revisions to that original training. Today, however, it is uncommon for a person to be able to maintain an employable status without putting efforts into updating the initial occupational training. As well, there is an increasing tendency for persons to engage in several different occupations during their lifetimes, as a matter of personal choice or vocational necessity.

This development, in fact, was demonstrated in the current Alberta Adult Basic Skills Study, on which this research is based. The ABS Study involved 500 respondents actively engaged in an employment position--i.e., a *job*. This *job* interpretation does not include those respondents who classified themselves as Student, Retired, Homemaker, or

Unemployed. Of the 500 actively employed respondents, 159 (or 31.8%) indicated different Usual and Current Occupations. This figure does not show occupational changes at other times in a respondent's career, but only those presently in effect, which tends to make the 31.8% an extremely conservative gauge of occupational change encountered in the Study. An offsetting factor to consider, however, is that the Usual and Current classifications assigned to respondents in the ABS Study were based mainly on the job titles given. A *change*, in this context, does not necessarily indicate a completely different occupational field, but might rather signify a different position (i.e., job title) in the same field.

The updating and retraining needs necessitated by society's increasing occupational flux present increased demands for the provision of adequate learning facilities. Education just doesn't last as long as it used to, and society has as much at stake in the provision of the necessary re-education process as does the individual. Pitman (1984) states that, "A nation's schooling system has some responsibility to train people for work in order that a viable economy be maintained" (p. 208).

Once the need for increased attention to adult education is recognized, it becomes necessary to determine the proper ways and means of providing that adult education. What constitutes functional adult education in our modern society? Without the benefit of previous experience, early adult educators assumed that adults should be expected to possess the same types and degrees of skills that younger learners were exposed to in the public school system. After all, the system is intended to provide society with functioning adults as end-products of the educational process. It followed, then, that the re-educated adults could be judged by the same criteria used to evaluate the younger learners. In

practice, this has meant labelling a program as adult, but using the existing public school methods, materials, and younger learner grade-level equivalents in its operation (Griffin, 1982). The grade-level for functional adult literacy (the educational level required of an adult to function effectively in our modern society), for example, has been judged by the Canadian Association for Adult Education (1982) to be a grade nine equivalency. The need to re-evaluate these guidelines in terms of adult competencies, rather than grade-level equivalents, was a concern of the National Advisory Panel on Skill Development Leave (1984).

It is not unusual, nor necessarily undesirable, for adult education programs to rely on the younger learner school system objectives. A concern has begun to develop among adult educators, however, that although the ultimate goal may be the same for younger and older learners, the competencies required to attain that goal may be markedly different for learners whose age, experience, outlook, and needs are so different. Younger learners have more general needs. They have not yet established definite career goals, nor have they satisfied the necessity to prepare themselves for a multitude of life experiences. Adult learners, on the other hand, are usually very career-specific in their educational needs, and they have a wealth of life experiences on which to base their educational acquisitions. The practice of equating adult competency level to children's grade levels is, therefore, likely to be inaccurate, misleading, and nearly impossible (Stiles & others, 1984). The problem, then, is to clarify these unique adult educational needs.

It is the ultimate goal of the Alberta Adult Basic Skills (ABS) research study to establish a set of competencies (skills) needed by an adult to function effectively in a modern society--specifically, a present-

day Edmonton, Alberta society. To this purpose, a *Profile of Competencies Needed for Adult Living* was established in September, 1981, by a group formed under the auspices of Alberta Advanced Education and Manpower, and the University of Alberta Department of Industrial and Vocational Education (Deane, 1985). This original Profile was reviewed by 448 representative Alberta adults selected on a volunteer basis by the Alberta Vocational Centres at Grouard, Slave Lake, Lac LaBiche, Edmonton, and Calgary. An attempt was made to select adults who represented a general cross-section of society, but no formal random sampling procedures were followed in the selection of reviewers.

The initial review, and subsequent revisions, have resulted in five successive versions of the Skills Profile. The modifications have affected approximately 30% of the original 1981 Profile items. The latest version, resulting from a 1986 enlargement of the Mathematics Skills Category, contains 84 *Basic* Skills, each of which is broken down into numerous *Sub* Skills, and then further into *Specific* Skills. The 84 Adult Basic Skills are listed in Appendix A1. As well, examples of two particular Basic Skills, and their break-down into Sub and Specific Skills, can be seen in Appendix A2.

The current ABS research study, with which the writer has been involved for three years, and which provides the basis for this thesis, is attempting to verify the general societal acceptance of the *Profile of Adult Basic Skills*--current version. More specifically, the ABS Study is designed to determine the relative importance placed on each of the 84 Basic Skills by respondents from an Edmonton, Alberta general population sampling (randomly selected from the address phone book). In addition, the Study intends to analyze reactions of the same respondents to the effectiveness

of a graphical *Model* developed to visually depict the interrelationships of the various Profile Basic Skills.

Demographic information (e.g., age, sex, employment status, occupation, education, cultural association, community, and mathematical background) was also collected from the respondents. This demographic information supplied the independent variables used in the subsequent analyses of respondent data. The three major independent variables, identified as central research foci of the Study, are *Occupation*, *Education*, and *Community*. The research described in this thesis concentrates on the Occupation variable.

Information was gathered on both the Current and Usual Occupations of each respondent, with the intention of determining the occupational perspective from which the respondent was evaluating the Profile's 84 Adult Basic Skills. Subsequent statistical analysis, then, was directed toward comparing the Profile evaluations of various respondent Occupational groups. It should be noted that respondents were requested to evaluate the Basic Skills from a general society viewpoint, and not from a specific occupational viewpoint. The analysis of evaluations, then, is intended to show whether or not different Occupational groups hold different opinions as to which Basic Skills are most important for functioning adults in general society.

Before Occupation data analysis could begin, ABS researchers were faced with the task of establishing each respondent's occupational perspective, from the information gathered. There were essentially two options. A single bit of respondent-supplied information, such as Current or Usual Occupation designation, could be accepted as representing the most likely major evaluation influence, or an attempt could be made to

arrive at a composite occupational description for each respondent. The composite approach was considered, but was judged to rely too heavily on subjective input from researchers in the determination of information relevance, weighting factors, summation procedures, etc.

The single occupational influence option had the obvious disadvantage of not providing a complete picture in many instances--such as when respondents had been involved in several occupations during their vocational careers. The advantages, however, included low researcher input, specific information relevance (i.e., specifically stated by respondents in response to a particular questionnaire item), and more reliable respondent comparisons. The most obvious pieces of respondent-supplied information for use in Occupation classification were, of course, the Current and Usual Occupation designations mentioned earlier. In cases where the Current and Usual Occupations were the same, no choice was necessary for respondent classification purposes. In the large number of instances (31.8%) of different Current and Usual Occupations, however, a choice was needed.

The main goal of the respondent Occupation classification was to identify the occupational perspective most likely to influence the respondent during the evaluation of the Adult Basic Skills. The Current Occupation, because of the respondent's immediate involvement, was considered by the researchers to be more apt to exercise the greatest influence on the Skill evaluations, even though the Usual Occupation would likely represent the more lengthy vocational involvement. Ultimately, the decision was a value judgement on the part of the researchers, designed to help insure a high degree of reliability in the respondent Occupation classifications. The statistical analysis, therefore,

concentrated on Current Occupation data for its group evaluation comparisons.

Respondents were occupationally classified according to the Canadian Classification and Dictionary of Occupations (CCDO) (Information Canada, 1974). The CCDO system allows for Occupation classification at three levels of group specificity: Unit, Minor, and Major. Examples of the CCDO system can be seen in Appendix B. Each respondent was classified to the most specific (Unit) CCDO level (e.g., Tellers and Cashiers), which automatically placed him/her in a more general Minor grouping (Bookkeeping, Account-Recording and Related Occupations). This Minor grouping, in turn, is included in a yet more general Major grouping (Clerical and Related Occupations).

The ABS Study utilized 21 of the 23 CCDO Major groupings in its respondent Occupation classifications. These 21 CCDO Major groupings were then collapsed to form the three ABS General Vocation categories of White collar, Grey collar, and Blue collar. Four additional ABS Employment Status categories (Student, Retired, Homemaker, Unemployed) gave a total of seven Occupational groups which were used in the statistical analysis (comparison of means) of the Adult Basic Skills evaluations. This Occupation data grouping procedure is represented graphically in Appendix C (Figure 1).

Initial statistical findings indicated very little pairwise significant differences amongst the seven ABS Occupational groups just mentioned, when comparisons were made of Adult Basic Skills evaluations. If only the White, Grey, and Blue collar categories are considered, post hoc statistical results (at the .05 level) indicate no incidences of pairwise significant difference in group evaluations of Adult Basic Skills. The practical

interpretation of these results is that a person's occupational classification (White, Grey, or Blue collar) has little significant influence on his/her rating for each of the 84 Adult Basic Skills contained in the Study, when the General Vocation categories are compared pairwise. That finding in itself is not so surprising, since the Adult Basic Skills were intended to be generic in nature, and not occupation specific. The writer does, however, harbor strong misgivings about data grouping procedures which resulted in the *no significant differences* finding for pairwise comparisons.

Mention should be made at this point of the terminology guidelines followed in this thesis. The *current* Alberta Adult Basic Skills Study refers to an ongoing research project initiated by Professor Art Deane in 1985 at the University of Alberta. This thesis concentrates on a particular portion (Occupational Data) of that ABS Study. While no specific distinction was made at the outset of the current ABS Study regarding the terms *vocational* and *occupational*, the writer has found it useful to assign specific meanings to these classifications. These meanings have been applied to both the current ABS Study data and the data analysis procedures of this thesis.

The classification *vocational* refers to situations involving an active job-role (i.e., employment for remuneration), and does not include the four occupation-related (Employment Status) categories of Student, Retired, Homemaker, and Unemployed. The term *occupational*, as used in this thesis, has a more general meaning, and includes all vocational groupings (e.g., General Vocation categories), plus the four Employment Status categories. More specific terminology is described in the Definition of Terms section appearing later.

It is the writer's opinion that the existing three ABS General Vocation categories are not sufficiently distinctive in their memberships to allow for meaningful group comparisons of their occupational perspectives. There is considerable overlap amongst the three general categories, and the wide range of occupations included in each category makes the attribution of common occupational group perspectives uncertain, at best. The White collar category, for example, currently contains such diverse occupations as Government Administrators, Draughtsmen, Nursing Aides, Musicians, and Ministers of Religion. The possibilities for occupational perspective mismatches are fairly obvious. For instance, both the Premier of Alberta and the drummer in a tavern trio would be placed in this White collar category.

The current ABS General Vocation categories were formed by combining entire CCDO Major groupings, which are each intended to cover broad spectrums of general vocational areas. The CCDO *Service Occupations* Major grouping, for example, includes such widely varying occupations as: Commissioned Armed Forces Officers, Janitors, Policemen, Funeral Directors, and Babysitters. The current ABS Grey collar category combines this *Service* Major grouping with the equally diverse CCDO *Clerical* and *Sales* Major groupings. A complete listing of CCDO Major groupings can be seen in Appendix B. The comprehensive approach taken by the CCDO often merges what might be considered the White, Grey, and Blue collar aspects of vocational areas. This is not surprising, since the CCDO's purpose is to classify entire vocational areas, without regard to White, Grey, or Blue collar considerations. Therefore, any statistical analysis conclusions based on the assumption of group discreteness for the current ABS General Vocation categories may contain

a questionable validity. Appendix C (Figure 1) provides a graphical depiction of the writer's group overlapping contention.

The writer contends that the White, Grey, and Blue collar categories must be made more distinctive (and discrete) before any meaningful conclusion can be drawn on the existence of Adult Basic Skills evaluation differences due to varying vocational perspectives. In addition, it is suggested that a statistical concern over a possible correlation amongst the Adult Basic Skills may be lessened, although not eliminated, by the selection of a number of unrelated (as judged by the writer) Skills for the group evaluation comparisons--rather than testing the entire Basic Skills Profile. This approach precludes any generalization to all 84 Adult Basic Skills, but provides the writer more confidence in forming conclusions about the presence of significant differences in the evaluations of the Skills selected. The likelihood of some correlation still exists, however, since the same sampling of respondents is used for the rating comparisons of all selected Basic Skills.

Six of the 84 Adult Basic Skills have been selected--one Skill each from six of the nine Basic Skill Categories (as shown in Appendix A1). The specific Skills selected are listed in the Null Hypotheses section of this chapter.

Purpose Statement

The purpose of this research is to restructure the statistical analysis of ABS Occupational group comparisons for particular Adult Basic Skills evaluations, by cluster sampling the coded data contained in the existing three General Vocation categories--White, Grey, and Blue collar.

1. It is expected that significant differences will occur when particular Adult Basic Skills evaluations are compared amongst 9 vocational groups (CCDO Minor) selected from the existing ABS White, Grey, and Blue collar categories. The comparisons will be made amongst the 9 vocational groups themselves, and not the White, Grey, and Blue collar categories from which they are selected--as explained in Approach One of the Methodology Chapter. The 4 ABS Employment Status categories (Student, Retired, Homemaker, Unemployed) will also be included in the group comparisons, for a total of 13 groups. The particular Adult Basic Skills involved in the group comparisons are listed in the following Null Hypotheses section. A complete list of all groups involved (Approach One) can be seen in the Methodology chapter, and a data grouping diagram is provided in Appendix C (Figure 2).

2. It is expected that significant differences will occur when particular Adult Basic Skills evaluations are compared amongst the White, Grey, and Blue collar categories, as represented by selected groups (CCDO Unit) from each of the 3 General Vocation categories. The 4 ABS Employment Status categories (Student, Retired, Homemaker, Unemployed) will also be included in the group comparisons, for a total of 7 groups. The Adult Basic Skills involved are the same as those in Research Hypothesis One (listed in the following Null Hypotheses section). The Occupational groups whose evaluations will be compared are not entirely the same, however, since Approach Two (as explained in the Methodology chapter) treats the White, Grey, and Blue collar categories as individual comparison groups. A data grouping diagram is provided in Appendix C (Figure 3).

Approaches One & Two.

There will be no significant differences in Occupational group comparisons of the ratings for Adult Basic Skill:

1. A-6: Store and Handle Food Safely
2. C-16: Develop An Estate Plan
3. D-5: Interpret Current Events
4. F-1: Acquire Interpersonal Skills
5. H-6: Write To Express An Idea or Convey Information
6. I-8: Understand Geometric Measurement

Definition of Terms

Adult Basic Skills. Competencies judged by the Alberta Adult Basic Skills Study to be requisite for an adult to function effectively in present-day Edmonton, Alberta, Canada society.

Profile. A categorized listing of the 84 Adult Basic Skills.

Employment Status categories. Four Occupation-related groups used in the Alberta Adult Basic Skills Study to classify respondents not currently involved in a traditional vocational setting: (1) Student (2) Retired (3) Homemaker (4) Unemployed.

General Vocation categories. Three groups used in the Alberta Adult Basic Skills Study to classify respondents currently involved in a traditional vocational setting: (1) White collar (2) Grey collar (3) Blue collar.

White collar. Occupations which normally require a university degree, or its equivalent, for full entry level professional recognition.

nature, which do not normally require a university degree, or its equivalent, for full entry level vocational recognition.

Blue collar. Occupations whose main concern is the direct manipulation of materials or machinery for utilitarian purposes, and whose entry level requirements do not normally include a university degree, or its equivalent.

Occupational groups. A general term that includes all Employment Status categories, all General Vocation categories, and all sub-groups deriving from any of them.

Vocational groups. CCDO Minor groups, selected from the existing ABS White, Grey, and Blue collar categories on the basis of both their easily identified occupational characteristics (e.g., training requirements, job duties, work environment) and their vocational discreteness (i.e., definite separation from other vocational groups). These groups are compared in Approach One data analysis.

Limitations

The research reported in this thesis is based on the current Alberta Adult Basic Skills Study, as has been noted earlier. It has been necessary, therefore, to accept the previously established procedures, instruments, and respondent data of the ABS Study. These factors have served to act as limitations on this thesis research. The only variation from the ABS Study allowed in this research is that of Occupation data grouping, which is the variable being tested. A change in any other factor would distort the comparison being made between the results of this research and those of the ABS Study. The main factors acting as limitations for this thesis study from the current ABS Study are: the adequacy of the respondent rating

scale, the CCDO occupational classification system, the original data codings, and the statistical instruments used. Each of these areas are discussed more fully in the Methodology chapter, but will be briefly explained here to indicate the limitations accepted by this research.

The rating scale used by ABS Study respondents to evaluate the 84 Adult Basic Skills consisted of a 5-phrase Likert-type scale, as follows: | Very Important | Important | Somewhat Important | Not Important | Don't Know |. No numerical values were made evident to the respondents. ABS researchers, in subsequent data coding procedures, interchanged the relative positions of *Not Important* and *Don't Know*, and assigned the following number values:

1-Very Important

2-Important

3-Somewhat Important

4-Don't Know

5-Not Important

For graphical display purposes, the scale was reversed in this thesis (i.e., *Very Important* carries a 5-value, and *Not Important* carries a 1-value). The resultant value-scale, and the associated graphs can be seen in the Results chapter (Figures 2-7).

The writer has encountered concerns expressed over the post hoc procedures of: (1) assigning numerical values to the ratings, (2) interchanging *Not Important* and *Don't Know*, and (3) creating a weighted scale. Specifically, the main concern expressed by other researchers is that, had the respondents known how the ratings would eventually be weighted, they might have evaluated the Skills differently than they did. For example, if it had been made evident that a rating of *Very Important*

carried a relative weight five times that of *Not Important*, a respondent's evaluation may have differed from the non-numeric choice given. As well, the fact that the nonjudgmental response of *Don't Know* has a value twice that of the *Not Important* rating caused some concern for those researchers reviewing the scale. While the writer, in hindsight, tends to agree with these concerns, the rating scale used in the current ABS Study was a predetermined factor, and therefore a limitation, for this thesis research.

A second major limitation for this study was the occupational classification system used in the current ABS Study--the CCDO system. This classification system is discussed at length in other sections of this chapter, and also in the Methodology chapter. Examples from the CCDO system can be seen in Appendix B. While the writer has described (Problem and Methodology chapters) perceived problems arising from the use of the CCDO system, it is felt that the data regrouping procedures followed in this thesis have greatly reduced reason for concern over this limitation.

The third limitation is also related to the CCDO system--that being the original Occupation data codings themselves. This thesis altered none of the original Occupation codings; rather it screened them by accepting some, rejecting others. The ABS Occupation data coding procedures are extensively discussed elsewhere in this chapter and the Methodology chapter. The major concerns expressed by the writer over the original codings have been greatly reduced by the screening procedures employed in this thesis. This limitation, therefore, while of great importance to the comparisons made between the findings reported in this research and those of the current ABS Study, posed no major concern for the writer.

The final limitation of note for this thesis concerns the statistical instruments and procedures employed by the current ABS Study. The occupationally-coded respondent groups were compared on the basis of their Adult Basic Skills ratings by a One-Way Analysis of Variance in the current ABS Study. Differences were tested for significance, at the .05 level, by a Scheffe multiple comparison procedure. These statistical tests, which are further explained in the Methodology chapter, are the ones used in this thesis research.

Since beginning this research, the writer has been given reason to believe that the statistical approach just mentioned was perhaps not the most appropriate one for the focus of the ABS Study findings. Specifically, the approach used is best suited for determining overall (main effect) differences, which are then, if significant, examined by the Scheffe test in a post hoc manner. The ABS Study concentrated on only pairwise comparisons (not main effect), and would probably have been better served by predetermined (a priori) pairwise comparisons, which require less stringent contrasts for significance. The need for replication by this thesis study in all areas except Occupation data grouping, as explained earlier, necessitated the adoption of the ABS Study statistical approach. Further explanation of concerns, and suggested alternative methods, for the statistical procedures followed are contained in the Methodology and Conclusions chapters.

II. Review of Literature

Introduction

The Needs section of this review attempts to describe the unique conditions that necessitate a study of adult functional competencies separate from younger learner competencies. The purpose of the Terminology section is to explain how the major problem of semantics can often cloud an understanding of adult functional competency studies. It also presents ' concept interpretations being used in the current ABS Study and the earch reported in this thesis. The different methods, past and present, that have been used by various sectors of society to address adult basic education needs are discussed in the Approaches section. Examples of the more notable types of adult basic education, and related, programs are presented in the Programs section. The Occupations section contains information more specifically related to occupational perspectives of adult functional competencies. General review findings are condensed in the Summary section. A very brief general purpose statement for the current ABS Study itself is also included, along with explanatory notes on the nature of this thesis research and its relationship to the overall ABS Study.

Needs

There is a growing need in our society to view education as an ongoing lifelong process, rather than solely a preparation for adulthood--as has traditionally been the case. It is becoming less and less likely that an early, one-time education can provide the skills necessary to equip a person for a lifetime of functional competency in our rapidly changing

North American society. The Canadian Commission for Unesco (1980) cites "the rapid pace of scientific, technical, economic and social change" as necessitating a consideration of education as "a life-long process" (p. 2).

There are several apparent reasons for the increasing inability of the traditional school system to adequately prepare learners for a life-long career and citizenship role. One major hindrance to the traditional school system's effectiveness is the fact that many of the skills which will be needed by its learners in their future roles do not yet exist. It's difficult to teach a skill that cannot be articulated, perhaps not even yet imagined. Tomorrow's needed skills can no longer be accurately predicted. Their provision, therefore, can no longer be accommodated during a person's first twenty years. Failure to recognize this reality will, according to a Canadian National Advisory Panel on Skill Development Leave (1983), pose serious consequences for Canada in the areas of international trade, technological advancement, and employment opportunity.

A second, related difficulty facing sole dependence on educational systems for the younger learner is the situation of educational obsolescence. Many of the known, in-demand skills of today may be as outdated as buggy whips in tomorrow's society. The Canadian Association for Adult Education (1982) has declared that "the useful duration of any skill--whether it relates to employment, family life, leisure, community affairs, or spiritual development--is rapidly becoming shorter" (p. 1). The consequence of skill obsolescence is fairly obvious, as was pointed out in a discussion paper prepared by the Ontario Ministry of Education (1981): "Because of the high rate of technological change, recent graduates may have to be retrained several times in their working lives" (p. 1).

In addition to the unpredictable nature of tomorrow's needed skills, there is a multiplicative aspect involved. As society progresses, the skills necessary for adult functional competency increase both in number and complexity. An American study which investigated the skills needed by entry level employees described a "necessary foundation of more highly complex intellectual skills required in an increasingly sophisticated and versatile work environment" (Junge & others, 1983, p. 20). Another report on the same study indicated the degree to which these increasingly complex skill needs are currently being met. Thirty items, in six basic skill categories--mathematics, writing, reading, speaking and listening, reasoning, and scientific knowledge--were assessed by personnel managers from 51 of Illinois' largest corporations.

The managers first ranked the 30 items in their importance for functional competence (job success). They then ranked the actual competence of entry-level employees in these 30 skills. A five-point Likert-type scale was used for the rankings. The means for requisite functional competence were then compared with the means for actual entry-level competence. Actual competence was judged, by the managers, to be below the level of competence needed for job success in every one of the 30 basic skill items. "The results of this study demonstrate a significant discrepancy between the skills that business and industry need and the level of competence that secondary school graduates bring to the work place" (Junge, Daniels & Karmos, 1984, p. 143). The current ABS Study asked respondents to perform much the same task as the managers did in the preceding study. Respondents were asked to rate the 84 Adult Basic Skills (Profile Items) as to their importance for an adult's functioning in general society. The topic of this thesis research draws the

similarity even closer, in that it concentrates on only the occupational aspects of respondent backgrounds in a comparison of evaluations.

Business and industry are only two sectors of society that have to contend with serious adult competency dysfunctions. Another major sector is the military. This problem is more obvious, and more widely reported, in the mammoth military organization of the United States than it is in Canada. The underlying causes, however, are likely similar in two such similar societies.

The U.S. Navy has found it necessary to implement remedial basic skills training because "the quality of the recruit population has declined and the job demands faced by enlisted personnel have expanded" (Bowman & others, 1984, p. 11). The average years of education that recruits possess continues to go up, while the level of basic skills performance remains fairly stable. During the 1981-83 period, about 3.6 percent of recruits were found to be at or below a grade six reading level. It is interesting to note that a higher percentage of high school graduates scored below the grade six level than did non-high school graduates. The percentage differences ranged from 1.02% (1983) to 1.45% (1982) (p. 11).

The U.S. Coast Guard findings were similar to those of the Navy. It reported "experiencing a severe mismatch between its need for a high aptitude entry level work force and the actual aptitude level of its recruits" (Glidden & others, 1984, p. 1). The skill level desired by the Coast Guard was at least grade eight in reading and mathematics. After several years of attempting, unsuccessfully, to carry on training programs with lower entry standards, the decision was made to implement their own basic skills upgrading program.

Higher education (post-secondary) is another sector of society that requires a minimum level of basic skills from the adults who enter its programs. The following New Jersey experience appears to be fairly typical.

> In the mid 1970s there was a growing realization among New Jersey college faculty and administrators that "things were not the way they used to be". Replace "things" with "students" and you have the gist of their complaint. Scholastic Aptitude Test (SAT) scores had been falling both nationally and within the state. (Lutkus, 1985, p. 7)

The New Jersey four-year post-secondary institutions reported a growing need for remedial sections of writing and math courses. A state-wide College Basic Skills Placement Test, administered to over 350,000 students in the eight years between 1978 and 1985, has produced "distressingly low" results. Of the Fall, 1984 entering students, only 26 percent were judged proficient in verbal skills, 28 percent in computation, and 12 percent in elementary algebra. Those results were consistent with the previous five years. Incredible as the New Jersey basic skills testing results seem, they are in agreement with similar remedial work studies carried on by both the City University of New York (1983) and the National Center for Education Statistics (1985) (Lutkus, 1985, p. 9).

Even if the requisite skills for adult functional competency in today's society had been anticipated by yesterday's school systems, and even if all the graduates had mastered all the requisite skills, there would still be a large portion of adult society in need of basic skills upgrading. These are the adults who, for whatever reason, never completed their

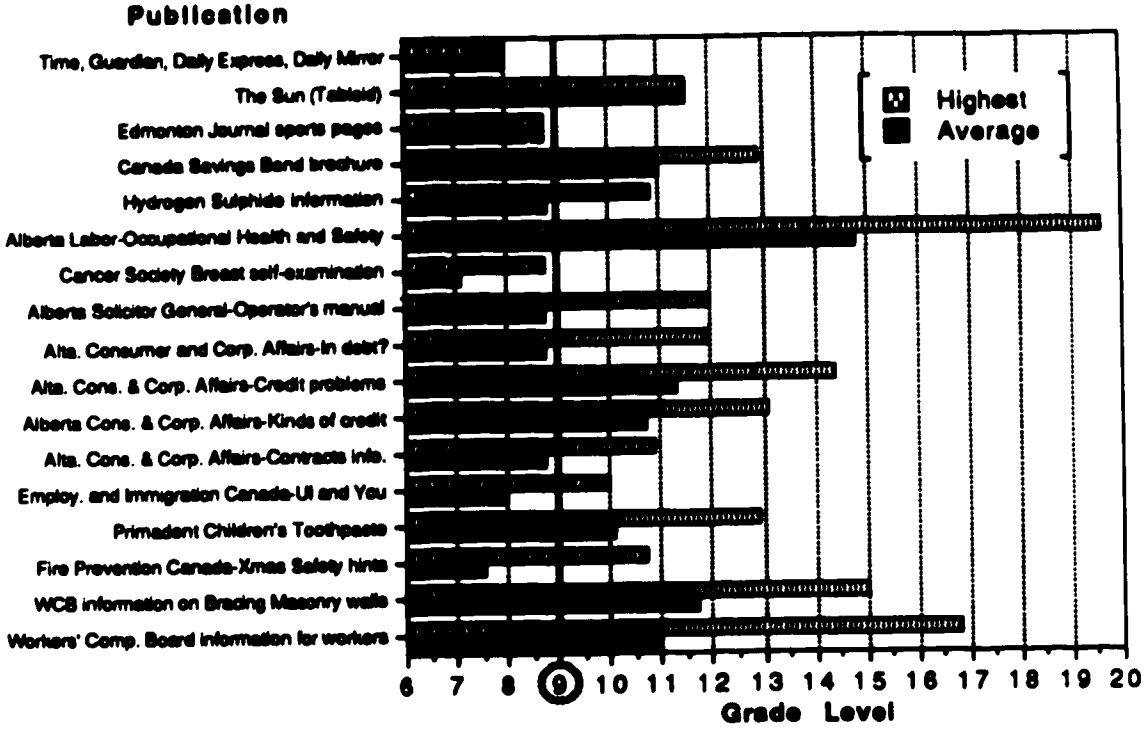
initial education. The question of adequacy in the public schools' skill training programs holds little relevance for this sizeable portion of adult society, since they never completed the programs in the first place. This group of people might be expected to have the most problems in satisfying society's demands for functional competence.

The most commonly employed measure of functional literacy in Canada is the one devised by the Canadian Association for Adult Education (CAAE). It relies on equating a person's competency to the skills expected of younger learners at certain grade levels of the public school system. This method is very convenient, easily implemented, and readily understood by most people. There has developed, however, a growing concern amongst adult educators that this method is misleading when applied to the functional competencies of adults rather than children. That concern will be enlarged upon later in the Approaches section of this chapter.

The level established by the Canadian Association for Adult Education as the minimum required for coping successfully with the competency requirements of today's society is a grade nine equivalency. Schmidt, in a 1982 report for the Ontario Institute for Studies in Education, has used the CAAE functional literacy guidelines to estimate that approximately five million adult Canadians might be classified as functionally illiterate. About one million of these people cannot read or write at all, and would be classified as totally illiterate. The preceding estimates come from the 1971 Canadian census, and might be dismissed as being outdated. More recent statistics, however, tend to support similar assumed levels of Canadian adult functional illiteracy.

"A 1977 survey, sponsored by World Literacy of Canada, revealed that 26.7% of the Metropolitan Toronto adult population might be classified as functionally illiterate in English" (Schmidt, 1982, p. 2). A 1981 Ontario Ministry of Education discussion paper estimated that 25 percent of the Ontario adult population have less than a grade nine education, and that 5 percent have less than a grade five level. In Quebec, a 1981 census showed almost 30 percent of the adult population to fall below the functionally illiterate level (grade nine), and 6.7 percent do not have even a grade five level. An even more recent survey (1983) found 4.4 percent of Quebec adults to be almost totally illiterate (Quebec, 1984).

The Alberta adult literacy situation is very similar to those already cited. A 1979 Alberta Adult Basic Education Project report gives the 1971 census finding of 28 percent of Alberta adults who may be considered functionally illiterate. The Ontario Ministry of Education contention that "one adult Ontarian in four could have difficulty in reading daily newspapers, most of which have a readability level of about Grade 8" (Ontario, 1981, p. 1) is mirrored in Alberta. Figure 1 illustrates the readability levels of common print materials that adult Albertans are frequently exposed to. It is clear that a functionally illiterate Albertan (falling below the vertical dotted line in grade level competency) could experience considerable difficulty with the majority of printed material that affects his/her societal role.



Source: Access Alberta: Adult Illiteracy Project, 1979, p. 3 and 4.

Figure 1. Readability levels of common print materials in the province of Alberta.

Note. From *Continuing Education: The Third System* (p. 34) by the Province of Ontario, 1981, Ottawa: Ministry of Education.

There seems to be little disagreement as to the growing need for attention to upgrading the functional competencies of many adults in our society. Other general statements of need also enjoy widespread acceptance. There is a need for "bridging the intergenerational gap, i.e., bringing adults up to the level set for the rising generation in the basic skills" (Byrne, 1981, p. 3). The need addressed by California's Adult Education Act is "to enable all adults to acquire basic skills necessary to function in society" (Stiles & others, 1984, p. 2). Ontario sees the adult basic education need as "to develop the knowledge and skills necessary for an adult to function in modern society" (1983, p. 2). Quebec assigns

"urgent priority" to the need for providing assistance to all persons who need help to read, write, count and express themselves so that they can earn a living and function in society" (1984, p. 13). Further intensifying Canada's need to give attention to adult functional competencies is the fact that the *baby boom* has hit here more dramatically than elsewhere. According to the Canadian Association for Adult Education (1982), Canada has an adult proportion of total population among the highest of western countries.

Just as there seems to be general agreement about the need for a concerted effort to address the area of adult functional competencies, there also seems to be general disagreement, or at least confusion, as to the form and direction this concerted effort should take. There is growing concern that many of the efforts expended towards improvement of adult basic skills are being misdirected, and are, therefore, less effective than they could be. There is even some suggestion that many of the efforts are in danger of being counterproductive, because the actual needs of the adults concerned have not yet been properly established.

It has been widely assumed, partly out of operational necessity, that adult basic skill needs could be extrapolated from the well-established traditional younger learner needs (i.e., public school curricula). What this has meant, in practice, is that adult basic competencies have been expressed in terms of younger learner grade level equivalents. The grade level equivalents are, of course, based on the traditional criteria for younger learner mastery in discipline content areas. Any use of these grade level equivalents implies acceptance of the validity of that traditional criteria for that particular use. This view has been under

here in Canada.

The Adult Performance Level (APL) Project (1971-76) out of the University of Texas in Austin was one of the first to concentrate on establishing a set of functional competencies more directly relevant to adult basic skill needs. The results of the APL project provided the groundwork for later attempts at clarifying adult basic skill needs (Deane, 1985). California was also an early leader in the effort to establish more adult-relevant basic skills criteria. A 1977 California adult basic education program report described the practice of equating adult competency level to children's grade levels as inaccurate, misleading, and "almost impossible" (Stiles & others, 1984, p.2). A more recent Wyoming study on job-related competencies found a large discrepancy between competencies established from traditional grade level analyses, and actual job-context measurement of competency nature and level (Rush, 1985). It is this empirical approach to adult basic skill needs evaluation that directed the research of the Alberta Adult Basic Skills Study, on which this thesis is based. The Wyoming study's occupational orientation holds added relevance, since this thesis is concerned with the occupational aspect of the ABS Study.

In Canada, there is evidence that the federal government is urging the provinces to direct their adult basic education efforts towards a more adult-relevant assessment of their programs. The recent federal Task Force on Skill Development Leave is an example of this thrust (National Advisory Panel on Skill Development Leave, 1984). Quebec has been a provincial leader in attempting to clarify the need for more relevant criteria in adult basic skills programs, but has been hindered by the

Ontario's Ministry of Education (1981) has also begun to question the validity of relating adult competencies to grade level equivalents. An early (1977-79) Adult Basic Education Project at the Calgary, Alberta Vocational Centre found grade level completion to be very inaccurate for placement purposes, even though their programs were based on grade level equivalents. In fact, "...71% of the students placed into the program at the A.L.C. [Adult Learning Centre] were functioning below their declared grade level" (Alberta Vocational Centre, 1979, p. 96).

In view of the studies and concerns cited, a strong argument can be made for the need to further research the functional competencies adults require to cope successfully with the demands of modern society. Research efforts are needed both in the area of general adult competencies (generic to most locales and situations), and also in the more specific areas of job-, locale-, and function-related competencies. The ABS competencies (skills) are intended to be generic. A further definition of adult functional competencies would provide future efforts in adult basic education with increased direction, purpose, and relevance.

Terminology

As is true with most educational concepts during their formative stages, adult basic education suffers from semantic uncertainties. Different studies may be using the same words, yet assigning widely differing meanings to these words. Take, for example, the recurring phrase *adult basic skills*. A quick review of various studies will reveal quite different interpretations for each of the three words in the phrase.

Adults, in most studies, are determined by age alone, with the general range for minimum age being somewhere between 15 and 25

years of age. There is, quite understandably, no maximum age for being considered an adult, although some programs do specify a maximum cut-off age for adult participants. The California Adult Student Assessment System (CASAS) programs list a rather flexible minimum age (16 to 18 years old), and a general *senior citizens* upper age (Stiles & others, 1984). The province of Quebec (1984) uses 15 years old as the adult threshold for adult education policy statement purposes, but adds the proviso that the person not be in full time attendance at school. The Economic Council of Canada lists young learners as those under 25 years of age (Canadian Association for Adult Education, 1982). The ongoing Alberta Adult Basic Skills research project--and, therefore, this thesis--defines an adult age as 18 years or older (Deane, 1985).

Basic is a term open to wide interpretation, usually dependent on the purpose of the study. For example, a study of corporate personnel directors' perceptions described as basic those "skills that will enable them [entry level employees] to contribute to corporate goals while attaining personal enrichment" (Junge & others, 1983, p. 9). Charles Suhor, director of the ERIC Clearinghouse on Reading and Communication Skills, regrets the time and effort expended on semantic analysis in education, and describes the phrase *basic skills* as "a battered term, much as terms like 'I.Q.' and 'progressive education' are battered" (O'Bryan-Garland & Parkay, 1985, p. 32). The Alberta Adult Basic Skills project formally defines a basic skill as "a fundamental ability to use knowledge, feelings, and/or the human body effectively and readily" (Deane, 1985, p. 11), but in practice implies it to be any competency required of an average adult to function in modern Alberta society.

Skills are variously described as ability, competency, proficiency, mastery, or adeptness by different studies. Studies which are based on traditional younger learner curricula usually imply a skill to be a certain level of mastery in a content area. The province of Ontario (1981) seems to employ this interpretation in their adult basic education efforts. Quebec programs give more emphasis to what have been called life skills, and are consequently more concerned with a competency perspective. Attention is directed towards enabling adults to gain more autonomy in their "economic, social or human environments" (Quebec, 1982, p. 21). The Alberta Adult Basic Skills project attempts to combine academic (content-oriented) skills with life (coping) skills, across the three general learning domains--cognitive, affective, and psychomotor.

Approaches

Once the intended outcomes (objectives) of a program are established, the *means* to the ends must be determined. Early adult education programs, mostly out of necessity because of their marginal existence, simply substituted adult learners for younger learners. The materials, settings, instructional techniques, placement methods, evaluation criteria, behavioural expectations, and sometimes even the hours remained the same. It was one way to fill the empty seats vacated after the wave of *baby boomers* had passed through the school systems. As convenient as this situation seemed for the providers (school systems), the receivers (adult learners) soon made it evident that changes were necessary.

The first accommodations made for the adult learners were changes in hours and locations. In Toronto, Ontario, the first Adult Upgrading Day School, founded in 1968, changed only the location. The

hours were 9 to 3, the teachers were straight from the public school classrooms, the learning materials were supplied from school board stock, but the classes were not held in school buildings. The six metro Toronto school board's Adult Day Schools of today have made concessions in the operational areas of attendance, behaviour, and time-tabling. A full 80 percent of the adult education teachers, however, still receive little or no guidance in the transition from younger learner to adult classrooms, adult education materials are scarce, and curriculum guidelines are borrowed from the traditional school system (Schmidt, 1982). Essentially, the approach of today's metro Toronto Adult Upgrading efforts is one of classroom-level modification of existing younger learner programs. The more energetic and resourceful the teacher, the more adult-oriented the program.

Alberta's early adult education approaches were a bit more adult-oriented than the Ontario Day Programs. The Calgary Vocational Centre's Adult Basic Outreach Project, begun in 1977, offered both different locales and extended hours for adult students. They were also able to staff the programs with Vocational Centre instructors who were already familiar with adult learners. Curricular material, as well, was more specifically geared to adult student needs--once again drawing on the adult orientation of the Vocational Centre resources. Competencies, however, were still measured in terms of younger learner grade level equivalents; and these measurements were used for placement, diagnosis, and evaluation (Alberta Vocational Centre, 1979).

The approaches taken by other Canadian adult education programs (including the impressive Saskatchewan BLADE Program, 1973) seem to differ mainly in the degree and amount of modification made to existing

younger learner curricular materials and techniques. The basis of the programs, the identified competency outcomes, are inevitably identical to, or dependent on, the content-based younger learner grade level equivalents. The early programs can hardly be faulted for adopting such an approach. It was a matter of existence. The marginal nature of their operations would not tolerate departure from the traditionally established goals of education--as identified by the public school system. Even if the early programs had realized the need for an adult-based competency system, there was none available in Canada.

In the United States, the Adult Performance Level (APL) Project (1971-76) at the University of Texas had laid the groundwork for defining adult education outcomes in terms of adult functional competency level, rather than younger learner grade equivalents (Deane, 1985). Several areas in the United States today (most notably California) are engaged in refining, or redefining, the adult functional competency approach to adult education.

The original Alberta Profile of Adult Basic Skills Project (1981-82) began the process of providing a Canadian approach to the identification of adult functional competency. Subsequent revisions have resulted in the production of a fifth edition of the Profile, which is the primary research instrument for the current Alberta Adult Basic Skills research study. The study's goal is to provide a current Canadian-context (specifically, Albertan) set of adult functional competencies that may be used to establish educational programs with more adult-relevant bases. If this type of approach is not adopted by the educational system at large, it is very likely that private sector interests will continue to expand their efforts in adult education.

As was pointed out in the Needs section of this review, special interest sectors of society--such as business, industry, military, and higher education--have found many adult entrants unable to function competently in their required roles. The response of the special interest groups has been to develop their own separate educational programs, and essentially disregard the efforts of the public school system. This private sector approach to the problem of adult functional competence has grown so rapidly that Ontario's Ministry of Education has suggested that "this training and education in the private sector may in fact be Ontario's most important growth industry today" (1981, p. 2).

A U.S. report, *American Education: An Economic Issue* (cited in Junge, 1984), found 35 percent of companies surveyed to provide remedial training for their employees. An example cited was American Telephone & Telegraph, which spent $6 million per year to provide basic reading and mathematics training for 14,000 employees. An Alberta symposium sponsored by the Edmonton Council of Advanced Technology (ECAT) produced the suggestion that the near future will see the offering of degrees by private sector corporations. At the same symposium, Dr. Bev MacKeen (Director of Alberta Career Development) "pointed out that in 1984, 30 of Canada's largest companies spent $1 billion on in-house training and education" (University of Alberta, 1987, p. 4).

If public education is to meet the challenge posed by the private sector intrusion into adult education, and is to remain a viable option for the provision of the adult functional competencies demanded by society, it must develop an approach that ensures adults are being educated towards these competencies. Surely, the first step in implementing such an

approach must be to identify the adult basic skills that will be needed to meet society's demands.

Programs

One of the first major U.S. competency-based adult basic education projects was the Adult Performance Level (APL) Project (1971-76) out of the University of Texas in Austin. This large-scale study provided a procedural framework for many later studies. The APL Project utilized what might be described as an inductive approach to establishing and verifying a set of adult functional competencies, in that it solicited, analyzed, and summarized opinions from thousands of respondents in all 50 States. The respondents included people from all levels of the adult basic education spectrum--administrators, instructors, students, and prospective students.

California State's Adult Education Division investigated the APL approach, but decided in 1976 to take a more deductive path to the establishment of a set of adult functional competencies. Initial efforts relied heavily on extensive reviews of literature and institutional input (particularly from the NOMOS Institute of Berkeley). It is interesting to note that the California results were quite similar to the APL findings, except that California placed a greater emphasis on the cultural aspects of adult functional competencies.

Subsequent developments in California have maintained the *from the top down* institutional approach to the verification of adult functional competencies. A 1978 formal, statewide assessment of California adult basic education programs led to the adoption in 1981 of a three-year State Plan for Adult Basic Education which stressed *life skills literacy* (Stiles & others, 1984). One of the major projects instituted by the three-year plan was the California Adult Student Assessment System (CASAS). A CASAS

Consortium was formed with adult education practitioner representatives from 40 California districts and agencies, as well as representatives from Washington State, Oregon, Idaho, Hawaii, Nevada, Arizona, and New York City.

Based at San Diego Community College, the CASAS project was undertaken to provide consortium members with "a comprehensive life skills assessment system in order to place adults at all levels of functioning in appropriate CBAE [competency-based adult education] programs, and to measure their growth toward life skill goals" (California Adult Student Assessment System Consortium, 1983, p. 9). To this end, the consortium has produced an Item Bank consisting of more than 2,400 test items designed to measure the life skills which may appear in competency-based adult education programs. There is a heavy emphasis on oral skills, since the project included ESL (English as a Second Language) programs in its target population.

The CASAS Item Bank is intended to satisfy the project's major assessment goals in the four areas of placement, achievement, certification, and curricular adaptability. The Bank's general identification label of Life Skill Competencies is divided into five major life skill areas: consumer economics, community resources, health, occupational knowledge, and government and law. An additional area of *computation* is included, but appears not to be classified as a life skill. These six areas are further divided into sub-skills, and further still to specific skills. Examples of the skill hierarchy in each of the six major skill areas is shown in Table 1. Note that the examples chosen are just random selections, intended to illustrate the format followed in the CASAS Item Bank.

Table 1

California Adult Student Assessment System (CASAS)

Life Skill Competencies (random sample items)

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1. Consumer Economics

   1.3. Understand methods and procedures used to purchase goods and services.

      1.3.6. Use coin operated machines

2. Community Resources

   2.4. Use the services provided by the post office.

      2.4.2. Interpret postal rates and types of mailing services

3. Health

   3.1. Understand common ailments and seek appropriate medical assistance.

      3.1.1. Interpret information about illness, including the description of symptoms and doctor's directions

4. Occupational Knowledge

   4.2. Understand wages, benefits, and concepts of labor organizations.

      4.2.3. Interpret employment contracts, union agreements, and employer handbooks

5. Government and Law

   5.4. Understand concepts of taxation.

      5.4.1. Interpret the short form of the income tax

6. Computation

   6.6. Use measurement.

6.6.6. Calculate with units of time

Note. From *California Adult Student Assessment System (CASAS) Project: Final Report 1982-83* by California Adult Student Assessment System Consortium, 1983, Sacramento: State Department of Education.

The increased attention to adult education in the U.S. has produced many smaller-scale projects than the ones noted in Texas and California. If a program does not have the resources, or perhaps the perceived need, to develop an adult competency basis for its efforts, it is quite likely that the program will attempt to adapt the existing, and available, public school curriculum to suit its adult education needs. Such a program is GIFT (Good Ideas For Teaching), sponsored by the Adult Basic Education Division of the Alabama State Department of Education, and based at Alabama University in Tuscaloosa.

GIFT provides assessment instruments for placing adult learners at one of three levels. The levels are determined by grade equivalents, with Level I equal to the content of grades 1-4, Level II equal to grades 5-8, and Level III equal to grades 9-12. Suggestions are made for instructional techniques and planning procedures, but there are no materials presented specifically for the adult learner (Leigh & others, 1980).

Even though many adult basic education programs (such as GIFT) still lean heavily on public school curricula, it is probably fair to say that these programs are more relevant to adult needs than were earlier programs. The educational concerns engendered by reports such as *A Nation At Risk* have resulted in an increased emphasis in public school curricula on basic skills and competency orientation. These changes tend to make the curriculum

more relevant to an adult basic education use, even though that is not their primary purpose. Project CAPABLE (Classroom Action Program: Aim: Basic Learning Effectiveness) of the Madawaska School District in Maine reflects this increased emphasis on basic learning skills. The program's interpretation of basic learning skills as "the ones the students will need when they are on their own and must direct their own study efforts" (1981, p. 3) illustrates the increased adult competency relevance.

The Texas Assessment of Basic Skills (TABS) is another attempt to insure certain competency levels are being met in the basic skills in public school curricula. The TABS competencies, however, are very content-oriented, and are restricted to the 3Rs (Austin Independent School District, 1984).

Private sector programs of adult basic education, such as those provided by business and industry, have already been mentioned in previous sections of this review. The programs tend to be, understandably, fairly job-specific, and do not deal with the full range of adult functional competencies. It seems obvious, though, that if the public education system does not begin to provide adequate functional competency preparation, business and industry will continue to expand their programs. It is a matter of survival for them.

The military, particularly in the U.S., have also instituted widespread programs of adult basic skills training. The U.S. Coast Guard's Basic Educational Enrichment Program (BEEP), begun in 1982, attempts to provide at least grade eight level reading and math skills to recruits in their training programs (Glidden & others, 1984). The U.S. Navy's Academic Remedial Training (ART) program has, since 1967, provided instruction in basic reading, study, and verbal skills to recruits who score below a grade six

reading comprehension level. Computational skills are also classed as job-relevant basic skills in the Navy's remedial training policy (Bowman & others, 1984). The ART program was expanded in 1985 to include all recruits scoring below the grade eight reading level.

Post-secondary education institutions have long provided remedial programs for students entering with competency problems. In many institutes, the question is no longer 'should the remedial programs be offered?', but rather 'how basic must the programs be to accommodate the deficiencies?'. The City University of New York (CUNY) provides an example of this approach. The 17 colleges that comprise CUNY all offer programs for students not able to meet the minimum competency requirements in three areas -- reading, writing, and mathematics. How basic do the programs have to be? Much of the content is at the adult functional competency, or basic skill, level--as defined by the current Alberta Adult Basic Skills (ABS) Project, and noted earlier in the Terminology section of this review. Lehman College (CUNY), for example, offers five courses in their remedial mathematics program. The Basic Mathematics I course covers whole numbers, fractions, decimals, ratio and proportion, and percent (Hecht, 1982, p. 31). These competency areas are identical to the first four basic mathematics skills in the Alberta ABS Profile (Appendix A1).

Canadian adult education programs, while fairly numerous and widespread, have traditionally been less competency-based than many of their U.S. counterparts. They have been heavily dependent on the public school system for their content, philosophy, and criteria. The Adult Upgrading Day Schools of the six school boards in metro Toronto, Ontario provide an example of this type of program. Begun in 1968, the Day Schools were essentially younger learner public school classes, with the younger

learners replaced by older learners. Only the locations were changed. The teachers, materials, resources, fixtures, curricula--even the hours (9 to 3)--were the same. Today's Toronto Day Schools have attempted to modify the programs to make them more adult-oriented, but a research study by the Department of Adult Education of the Ontario Institute for Studies in Education found the programs to be seriously lacking in their attention to adult functional competency needs (Schmidt, 1982).

The first Canadian attempts at establishing truly adult programs involved modifying existing educational materials to more closely reflect the adult experiences and perspectives. Such an approach is the basis for an early (1973) BLADE (Basic Literacy for Adult Development) program out of Prince Albert, Saskatchewan. Under the auspices of the Department of Manpower and Immigration, the Training Research and Development Station produced an extensive array of program materials for two basic subprograms--*Communications* and *Computations*. Each subprogram contained 115 instructional books (a total of approximately 5,000 pages) with accompanying tests and exercises, plus over 200 different half-hour cassette tapes to augment the visual materials.

The materials were intended to be "adult in context" and to "utilize adult mental abilities" (Training Research and Development Station, 1973, p. 9), and have been heavily utilized by other Canadian adult education programs. The program objectives, analyses, and evaluations are all stated, however, in terms of public school (younger learner) criteria. The four *levels* of the program are intentionally matched to the grades one to four curricula, and the stated program objective is to "bring the student to a measured level of 'Grade 5.0'" (p. 1).

The Adult Basic Education Outreach Program (begun in 1977) produced by the Alberta Vocational Centre, Calgary, is similar in approach to the Saskatchewan BLADE program. It is based on a three-level structure that is equated to grades 0-3, 4-6, and 7-9. Materials have been produced and modified to suit adult learners, but the program objectives and evaluations are geared to traditional younger learner criteria. A community-based Adult Learning Centre (A.L.C.) was opened in September, 1978 at a Calgary library, for the purpose of offering "an ABE program in reading, writing and arithmetic to the grade 9 equivalency level" (Alberta Vocational Centre, 1979, p. 2).

The tradition of equating adult functional competency to grade level equivalents is reinforced by the practice of business and industry to state job-entry requirements in terms of grade level completions. Recent Canadian government (both provincial and federal) policy statements on adult education programs have expressed concern over the validity of that evaluation criteria.

A 1984 Province of Quebec Department of Education policy statement points out that, in order to function in society, adults require more than basic schooling, and "these needs cannot be measured solely by the amount of schooling acquired" (p. 11). As part of Quebec's Continuing Education Program, a centre has been formed which will use input from five government departments to provide consultation and direction in the area of adult education.

The National Advisory Panel on Skill Development Leave (1984) suggested a combination of functional competency measures and grade equivalencies, which they termed "functioning grade equivalency" (p. 10). Grade equivalencies are defined in terms of functional competencies "rather

than years attained/attended" (p. 10). The Panel stresses that provincial adult basic education programs should emphasize basic and generic skills. It is the purpose of the current Alberta Adult Basic Skills Project to clarify the nature of, and verify the importance of, these needed adult basic skills. The ABS Project's verification of these skills includes occupational-based group comparisons, the subject of this thesis. It is hoped that the identification, and verification, of relevant adult basic skills may benefit future adult basic education programs by providing an alternative to the traditional grade equivalency criteria.

Occupations

The separation of job skills from general life skills is becoming less pronounced as the North American economy shifts from an industrial base to one dominated by the provision of information and services. The shift, as noted by Pritz (1988), has resulted in a greater emphasis on the more generic basic skills, and less on the more specific job skills. She likens the emerging competency requirements for entry-level workers to those expected of continuing postsecondary students, and suggests that one of the major goals of vocational education is to provide "an enhanced ability for individuals to function in a complex society" (p. 26).

Leach and Chakiris (1988) stress the same theme of a changing workplace environment where competency requirements are increasingly drawn from generic life skills, and less from specific technical skills. Like Pritz, they attribute this in large part to the changing economy, and offer predictions that by 1995 the service industries will be generating perhaps nine out of ten new jobs. These new career roles will require less specific technical competencies, and more general functional competencies. As a result, "Career development should have one overriding mission as it

progresses into the future: to contribute to *all* citizens, regardless of employment status, choice of career form, or presence of work and life role transitions" (p. 54).

The shift in vocational competency requirements from specific technical to generic functional, as noted in the preceding paragraphs, has resulted in the creation of new competency labels. One such label gaining widespread acceptance is *employability skills*. Buck and Barrick (1988) describe employability skills as those being essential for getting and keeping a job. These skills are "sometimes called people skills, independent living skills, everyday living skills, or personal/social skills" (p. 29). Even though it is fairly obvious that a certain technical competency is required to get and keep most jobs, Buck and Barrick apparently do not include these competencies in their definition of employability skills. As specific examples of employability skills, they offer: "following oral, visual, written, and multi-step directions; accepting authority and criticism; working well with others; ... demonstrating good grooming and personal hygiene; and showing a high regard for safety regulations, the rights of others, and one's own work record" (p. 29).

Wentling (1987), as well, separates specific technical skills from employability skills, which she defines as "those general skills and knowledges needed by all persons if they are to be effective in seeking, obtaining, and retaining employment" (p. 351). Among her specific examples of employability skills are: verbal communication, working with others, resume preparation, flexibility, and new task mastery. According to Wentling, employers do not find a problem with the technical skills of most vocational graduates, but are alarmed at the widespread lack of nontechnical

employability skills. She infers that the major cause of job loss is not tec[illegible] ineptitude, but rather lack of employability skills.

A vocational study previously cited in this chapter (Rush, 1985) might be viewed as contradicting the foregoing contentions of widespread employability skills problems, since it reported worker overachievement in some areas related to employability skills. The study concerned reading, writing, listening, and speaking requirements encountered in ten widely varying skilled occupations: account clerk, automotive mechanic, draftsman, electrician, heating and air conditioning mechanic, industrial maintenance mechanic, licensed practical nurse, machine tool operator, secretary, and welder. Rush found most workers performing above expected levels, as established by analysis of the training programs completed for entry into the occupation.

The overachievement was attributed to the fact that success in job-related competencies is "highly dependent on situational factors and must be defined in terms of the requirements of specific settings" (Rush, 1985, p. 35). Rush, however, included only successful workers in his study, and was not concerned with performance levels of unsuccessful workers. No conclusions could, therefore, be drawn from his study on the probable causes of worker dismissal. It might be argued, in fact, that his study is favorable to the previous contentions, in that the successful workers he studied were those who had apparently mastered those particular employability skills. That conclusion, however, must be judged in light of the narrow scope of employability skills studied by Rush.

It has already been noted earlier in this chapter that the corporate sector of society is finding it necessary to provide an ever-increasing amount of basic skills training to its workers. A recent U.S. survey (Lee, 1988)

found that nearly 20 percent of companies with more than 50 employees provide some type of remedial basic education. That figure jumps to 30 percent for organizations employing more than 10,000 workers. The corporate involvement has been a matter of survival because, as Lee notes, "75 percent of those who will be in the labor force in the year 2000 are already *in* the labor force" (p. 28). His point, of course, is that changes in the public education system will have little effect on the workforce basic skills level in the near future.

Lee (1988) also reports a gradual shift in the focus of many of these corporate basic education programs. The earlier efforts concentrated on improving skills in a particular area of deficiency--an area critical to the worker's individual responsibility in the corporation. Some of the more recent programs are attempting to broaden the scope of the upgrading, in the belief that corporate growth will inevitably result from the individual growth of employees. An example of this is the union-management effort of The United Auto Workers and Ford Motor Company, begun in 1982. Offerings in the program include adult basic education, high-school completion, and English as a second language. A total of 8,300 employees, at 42 locations, have participated in this Skills Enhancement Program thus far.

Canadian figures for employee adult upgrading participation are also increasing dramatically. A recent Statistics Canada Adult Training Survey was included as a supplement to the January, 1986 Labour Force Survey. It indicated a total of 1,843,008 adult employees (18-65 years of age) had participated in education or training programs, for clearly job-related purposes, during 1985. Of this total, 51,258 were involved in full-time programs sponsored by their employers. The job-related purposes included

"increasing earnings, improving job skills, improving job opportunities, or general career development" (Canadian Association for Adult Education, 1988, p. 22). It is interesting to note that, of the total upgrading program participants, only 2 percent would be classified as functionally illiterate (0-8 years education), while the functionally illiterate account for 20 percent of the general adult population. It would appear that those in most need are not, for whatever reason, the ones benefitting most from the upgrading programs.

The gradual shift, as noted in the preceding paragraphs, in the focus of occupational skill development concern from job-specific technical competencies to more general functional competencies holds relevance for the Alberta Adult Basic Skills Study, and, in particular, the occupational analysis of the ABS Profile, as examined in this thesis. A review of the ABS items in Appendix A will show that most of the general competencies labelled as desirable *employability skills* by the references noted are among those Profile Items which were rated by the respondents in the Study.

Summary

There are several apparent causes for the increased concern with the quality of all phases of adult education--preparatory, remedial, recurrent, upgrading, retraining, or continuing. One of the most obvious causes is the fact that there are simply more adults who may be in need of functional competency attention than ever before. Canada has, and will continue to have for the near future, a greater proportion of adults than most other western countries. The ever increasing pace of technological advancement is another cause for concern about adult functional competencies. The level of functional literacy inevitably goes up with each advance in knowledge.

The functional adult of today must know more than the functional adult of yesterday, because there is more to know today than yesterday.

As well as expanding the amount of functional competencies needed, society's technological or sociological advancements also change the type of functional competencies required. Yesterday's mastered functional competency may not be needed in today's society. Take, for example, everyday measurements. Yesterday's functionally competent Canadian adult had to know the weight of a pound, the length of a mile, and the chill of twenty above zero. Things have changed. Today's functionally competent Canadian adult is expected to know how to deal with grams, kilometers, and degrees Celsius--as well as retain understanding of the Imperial system, since Canadian society stubbornly clings to it in many instances. Similar examples hold for other areas of adult competency--banking (e.g., automated tellers), cooking (e.g., microwaves), taxes (e.g., RRSPs), etc. Simply maintaining a certain level of competency requires an adult to be continually engaged in learning--either formalized or self-directed.

To determine if an adult is functionally competent or not, both the competencies and the level of mastery required must be known. Traditionally, it has been assumed that both the competencies and proficiency levels required of adults could be extrapolated from the expectations placed on younger learners, as found in the public school curricula. In the late 1960s and early 1970s, concern for the validity of that traditional approach caused several large-scale U.S. studies to look into the clarification of functional adult competencies. Most notable was the Adult Performance Level (APL) Project (1971-76) out of the University of Texas. Today, California seems to be the U.S. leader in the research into adult functional competencies.

Canadian adult education programs of the same time period as the APL project were still accepting, apparently without question, the adoption of public school curricula expectations--if not also the materials and methods--for use with adult learners. If changes were made to the younger learner programs, they were in materials or methods, not competency expectations. A notable early (1973) Canadian program was the BLADE (Basic Literacy for Adult Development) Program out of Prince Albert, Saskatchewan. Extensive new materials were produced, and methods were somewhat modified to suit adult learners, but the basis for the program remained the grade equivalent expectations of the public school curricula.

It was not until the early 1980s that Canadian adult educators began to explore the definition of adult functional competencies. The original Alberta Adult Basic Skills research efforts (1981-82) resulted in *A Profile of Competencies Needed for Adult Living*. Subsequent revisions to this original Profile have resulted in a fifth edition version--*Profile of Adult Basic Skills*--which is the main research instrument for the current Alberta Adult Basic Skills (ABS) Research Project (begun in 1985). The purpose of the ABS Project is to clarify the nature of functional competencies (skills) required by adults living in Edmonton, Alberta. The skills are specified, explained, and related through use of a Profile, a Catalogue, and a Model. The importance of each specified skill has been rated by a random sample of 818 respondents from the general population of Edmonton, Alberta adults. It is hoped that the results will provide an alternative to the traditional grade level equivalence approach for considerations of adult functional competencies.

Public school grade level criteria hold little relevance for the consideration of what are often called *employability skills* in the occupational arena. More appropriate guidelines are likely found in a

consideration of life skills, functional competencies, or personal/social skills--such as those itemized in the ABS Profile. The appropriateness of these items for use in an occupational context depends on the occupational perceptions of their worth. Such perceptions, as determined from analyses of ABS evaluations by respondent occupational groups, form the focus of this thesis.

III. Methodology

Subjects

The basic aim of both data grouping Approaches described in this thesis is to assure that all the subjects in each of the selected Occupational groups (13 in Approach One, 7 in Approach Two) can reasonably be expected to possess occupational characteristics common to that group (as judged by the writer).

The existing three ABS General Vocation categories--White, Grey, and Blue collar--currently contain coded occupational data for all 495 respondents engaged in a traditional vocational setting (i.e., employed in a job-role). It should be noted here that the number of job-role respondents was initially 500 (as mentioned earlier), but was reduced to 495 after a credibility screening procedure which involved all respondents. The remaining 259 respondents are included in the Study's four Employment Status categories: Student, Retired, Homemaker, Unemployed. The two cluster-sampling Approaches employed in this research reduced the number of respondents involved from the White, Grey, and Blue collar categories.

In Approach One, 151 respondents (30.5%) were sampled from the White, Grey, and Blue collar categories. In Approach Two, 109 respondents (22.0%) were sampled from those three categories. In both Approaches, the entire Employment Status categories (Student, Retired, Homemaker, Unemployed) are accepted as they presently exist. Approach One, therefore, employs a sampling of 410 from the Study's

entire 754 eligible respondents, for a participation of 54.4%. Approach Two involves 368 of the 754 eligible respondents, for a 48.8% sampling.

Instruments

The occupational data coding instrument used to provide the subject classifications for this research is the Canadian Classification and Dictionary of Occupations (CCDO) (Information Canada, 1974). Sample codings from the CCDO can be seen in Appendix B.

The Adult Basic Skills which provide the basis for the group evaluation comparisons were taken from the Profile of Adult Basic Skills, which is the primary research instrument of the current Alberta Adult Basic Skills Study. The entire Profile contains 84 Basic Skills. Six of these Skills were selected for the research described in this thesis. Two criteria guided the selection of the particular Skills chosen: (1) likelihood of occupational influence, and (2) likelihood of interSkill correlation. The intent was to select the Skills which were most likely to be occupation-influenced, and least likely to be closely correlated. In both cases it was the writer's judgment which determined the final selections.

The Profile of Adult Basic Skills is divided into nine Skill categories, which can be seen in Appendix A1. The first step in the selection of particular Skills involved determining which Skill evaluations, in the opinion of the writer, were most likely to be influenced by a respondent's occupational perspective. Two Skills were selected from each of the nine categories. The Skills from some categories were not as occupationally-oriented as from others, and the original 18 selected Skills were pared to the most relevant 12 Skills.

The second consideration in the selection of Skills for comparison was the desire to avoid Skills which were closely related. A high

correlation amongst the Skills being evaluated would reduce the validity of any statistical finding of significant difference in the group comparisons. A subsequent culling of related Skills further reduced the number retained for group comparisons from 12 to 6. These six Skills are the ones previously listed in the Null Hypotheses section.

One-Way Analysis of Variance (ANOVA) results were used to test for mean differences in the Occupational groups' Adult Basic Skills evaluations. A Scheffe multiple comparison procedure was then used to test for any significance among pairs of means, at the .05 level. The Scheffe Test is considered a conservative method of means comparison, in that it requires larger differences than most other methods before significance is indicated (Norusis, 1983, p. 111).

Procedure

There seem to be two major factors contributing to the present nondiscreteness of the ABS General Vocation categories. Firstly, the elements (the CCDO Major groups) used to build each category are too comprehensive to maintain the required White, Grey, and Blue collar distinctions. Secondly, a number of the CCDO classifications, even to the Unit group level, are too vague to avoid coding uncertainties. The occupational characteristics cannot be clearly delineated. Therefore, some of the group memberships cannot be determined within a reasonable certainty. The writer was responsible for approximately 90% of the respondent Occupation coding in the current ABS Study, and dealt firsthand with the coding uncertainties just mentioned.

While the great majority of respondents were quite readily Occupation-coded to a specific CCDO Unit group classification, a fair number (note following figures) posed some coding uncertainty. A record

was kept of the codings which, because of insufficient respondent information or inadequate CCDO group specificity, presented some uncertainty. At the CCDO Unit group level, the uncertainty involved approximately 18% of the respondents--as determined by a random sampling of 100 from the 815 respondents initially coded for Current Occupation. It should be mentioned that, although respondent Occupation coding uncertainties were a major consideration in the current ABS data analyses, they do not form a major focus for the research reported here. That may sound contradictory, but comes about because of the after-coding data grouping differences between the current ABS Study and this research.

The current ABS Study included all Occupation classified respondents (754) accepted for initial data analysis. The original 815 respondents had been screened for missing or improper data, resulting in the 754 acceptable respondents. This all-inclusive approach served the comprehensive nature of the Study's initial data analysis, but obviously required the inclusion of the coding uncertainties previously described. The two different data grouping procedures reported here (described later in this section) involve a cluster-sampling approach to respondent Occupation data analysis. The object of the cluster sampling is to clarify the data groupings used in ABS Occupation data analysis, by reducing the coding uncertainties involved. This sampling approach to Occupation data analysis is, of course, far less comprehensive in its findings than the initial ABS data analysis, but hopefully assures more certainty in the validity of its findings.

The coding uncertainty considerations are described here in an attempt to help explain the writer's sampling procedures, which involved

selecting CCDO groupings likely to contain very few membership uncertainties, while eliminating CCDO groupings likely to contain a high level of membership uncertainty. Examples of high certainty CCDO groupings (included in this research) are: *Architects and Engineers*, *Food and Beverage Preparation*, and *Mechanics and Repairmen*. Examples of low certainty CCDO groupings (excluded from this research) are: *Occupations Related to Management and Administration*, *Other Service Occupations*, *Material-Handling and Related Occupations*, and *Occupations Not Elsewhere Classified*.

This research employs two Approaches to avoiding the grouping uncertainties just described. Both Approaches involve what amounts to a cluster-sampling of the total respondent occupational data bank. The purpose of the resultant analyses is to establish the existence, or lack, of any significant evaluation differences due to occupational perspective. The findings, of course, cannot be generalized to the entire respondent population, but a finding of significant evaluation differences would not require the entire population, while a finding of no significant evaluation differences would lend additional credibility to the initial ABS statistical analysis of occupational influence.

The writer would, once again, like to point out that this research was initiated not because the initial ABS statistical findings indicated no significant evaluation differences due to occupational perspective, but rather resulted from a subsequent review of the occupational data grouping procedures that led to the statistical findings. As has been previously noted, the 84 Adult Basic Skills which were evaluated by respondents are purposely intended to be general in nature, and not occupation-oriented. A finding of no significant differences among mean

ratings of the groups is, therefore, not surprising. It is, in fact, quite supportive of the original intentions of the Adult Basic Skills formulation efforts.

The concern with Occupational analysis validity, which forms the basis of this research, did not surface until a comparison of the statistical findings for the Study's three major independent variables (Occupation, Education, Community) led to a review of the Occupational data grouping procedures. It is the validity of the data grouping procedures leading to the statistical findings, and not the nature of the findings themselves, that is being questioned by this research. Simply put, it is not surprising to find no significant occupational influence on Skill evaluations, but this conclusion should result from demonstrably valid data grouping procedures, or the efforts of the ABS Study itself will suffer in credibility. The Study's findings should not be based on pre-analysis grouping procedures which, in the writer's opinion, promote a blending of original respondent occupational data.

The purpose of the two data analysis Approaches described in the following pages is to lessen the possibility of invalid results due to amorphous data groupings.

Approach One.

The first analysis Approach involved selecting fairly large (CCDO Minor) vocational groups from each of the three existing ABS General Vocation categories. These groups were selected because of their definite vocational characteristics, and the subsequent reduction of coding uncertainty involved in establishing the group memberships. The groups are small in number (nine in total), but relatively large in size (from 9 to 27 members). The emphasis, then, is one of strong vocational identity,

with little regard for comprehensive representation of the entire White, Grey, and Blue collar categories. The main thrust was to assure the comparison of discrete, definite occupational perspectives.

The following groups are included in the first Approach. Comparisons were made amongst all nine groups, as well as with the existing four ABS Employment Status categories--for a total of 13 groups (or categories) involved in the group comparisons.

Group	Size	CCDO Minor Group #
General Vocation categories:		
(White collar)		
1. Architects & Engineers	16	214/215
2. University Teaching	11	271
3. Elementary & Secondary School Teaching	27	273
(Grey collar)		
4. Bookkeeping & Account-Recording	24	413
5. Stenographic & Typing	20	411
6. Food & Beverage Preparation	13	612
7. Sales Occupations, Services	13	517
Blue collar)		
8. Mechanics & Repairmen	9	858
9. Construction Trades	18	878/879

Employment Status categories:		
10. Student	86	ABS
11. Retired	49	ABS
12 Homemaker	97	ABS
13. Unemployed	27	ABS
Total Sampling	410	
Total Eligible	754	
Sampling %	54.4	

Approach Two.

The second analysis Approach involved selecting many fairly small (CCDO Unit) occupational groupings from each of the three ABS General Vocation categories. These groupings were selected both because of their definite vocational characteristics (which promote high group coding certainties), and because, as a group, they are representative of the wide range of occupations considered to possess the attributes of that particular General Vocation category, as defined in this thesis. The emphasis, then, is on comprehensive representation for each of the White, Grey, and Blue collar categories. The main thrust was to assure the maintenance of distinct occupational characteristics, as defined in this thesis, for the three ABS General Vocation categories.

The following groups were formed for the second analysis Approach. Comparisons were made amongst the three General Vocation categories (White, Grey, Blue collar), as well as with the four ABS Employment Status categories--for a total of 7 groups (or categories) involved in the group comparisons.

Group	Size	CCDO Unit Group #
General Vocation categories:		
1. White collar		
Government Administrators	2	1113
Organization & Methods Analysts	2	1173
Civil Engineers	2	2143
Electrical Engineers	?	2144
Mechanical Engineers		2147
Psychologists	2	2315
Lawyers & Notaries	7	2343
Ministers of Religion	3	2511
University Teachers	9	2711
Physicians & Surgeons	5	3111
Product & Interior Designers	3	3313
White collar Sampling	38/246 = 15.4%	
2. Grey collar		
Typists & Clerk-Typists	3	4113
Tellers & Cashiers	5	4133
Library & File Clerks	3	4161
Telephone Operators	2	4175
Sales Clerks, Commodities	7	5137
Insurance Salesmen & Agents	6	5171
Chefs & Cooks	3	6121
Waiters, Hostesses, & Stewards	4	6125
Barbers, Hairdressers, & Related	2	6143

Grey collar Sampling	35/164 = 21.3%	
3. Blue collar		
Baking, Confectionery Making	4	8213
Slaughtering, Meat Cutting	2	8215
Sheet-Metal Workers	2	8333
Welding & Flame Cutting	3	8335
Motor Vehicle Mechanics	3	8581
Aircraft Mechanics & Repairmen	1	8582
Construction Electricians	2	8733
Carpenters & Related	5	8781
Plasterers & Related	1	8784
Painters, Paperhangers & Related	3	8785
Pipefitting, Plumbing & Related	4	8791
Conductors & Brakemen, Railway	1	9133
Bus Drivers	1	9171
Taxi Drivers & Chauffeurs	2	9173
Truck Drivers	2	9175
Blue collar Sampling	36/85 = 42.4%	
Employment Status categories:		
4. Student	86	ABS
5. Retired	49	ABS
6. Homemaker	97	ABS
7. Unemployed	27	ABS

Total Sampling	368
Total Eligible	754
Sampling %	48.8

IV. Results

Approach One

Thirteen Occupational groups were compared on the basis of their evaluations of six Adult Basic Skills in the Approach One analyses (Appendix C, Figure 2). The Scheffe multiple comparison procedure indicated no cases of pairwise significant difference in group means, as established by ANOVA results at the .05 level. Three of the six Skills, however, showed overall (main effect) differences. Three of the six Approach One Null Hypotheses outlined in the Problem chapter were, therefore, rejected. The Basic Skills showing main effect group comparison significant differences are:

A-6: Store and Handle Food Safely

C-16: Develop An Estate Plan

I-8: Understand Geometric Measurement

The graphs on the following pages show the results of all six Adult Basic Skills evaluation comparisons made in Approach One.

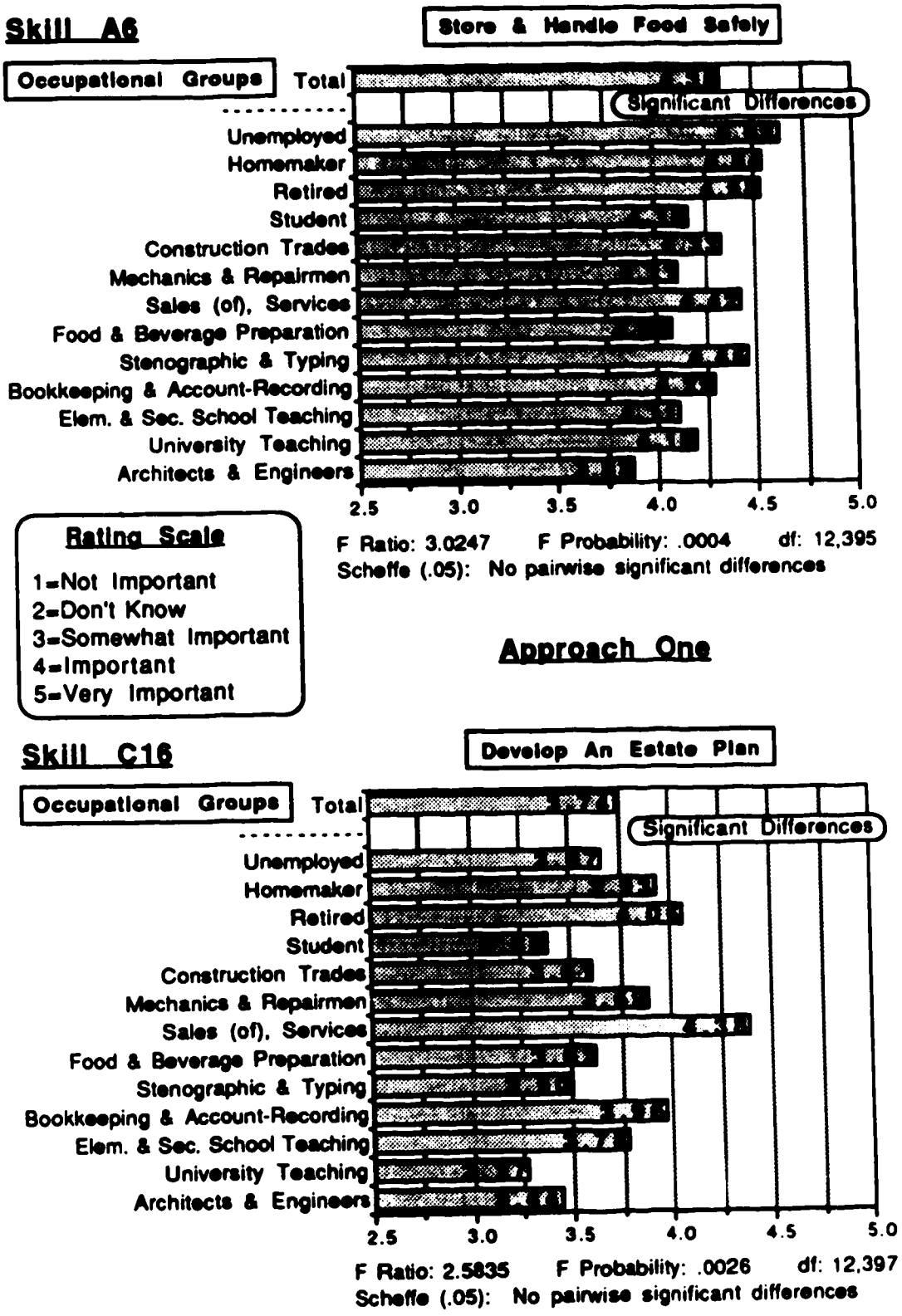

Figure 2. Approach One Results--Skills A6, C16.

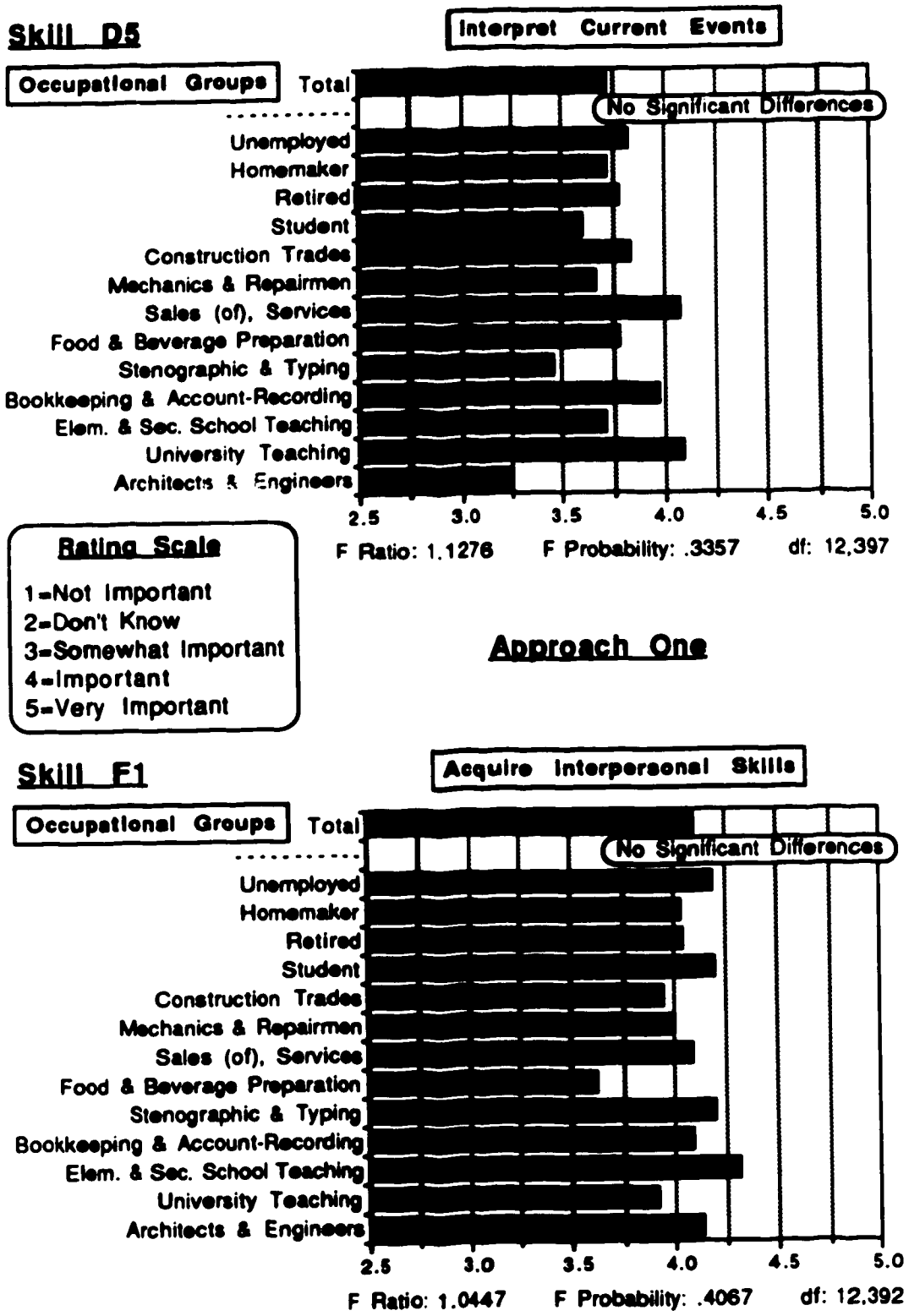

Figure 3. Approach One Results--Skills D5, F1.

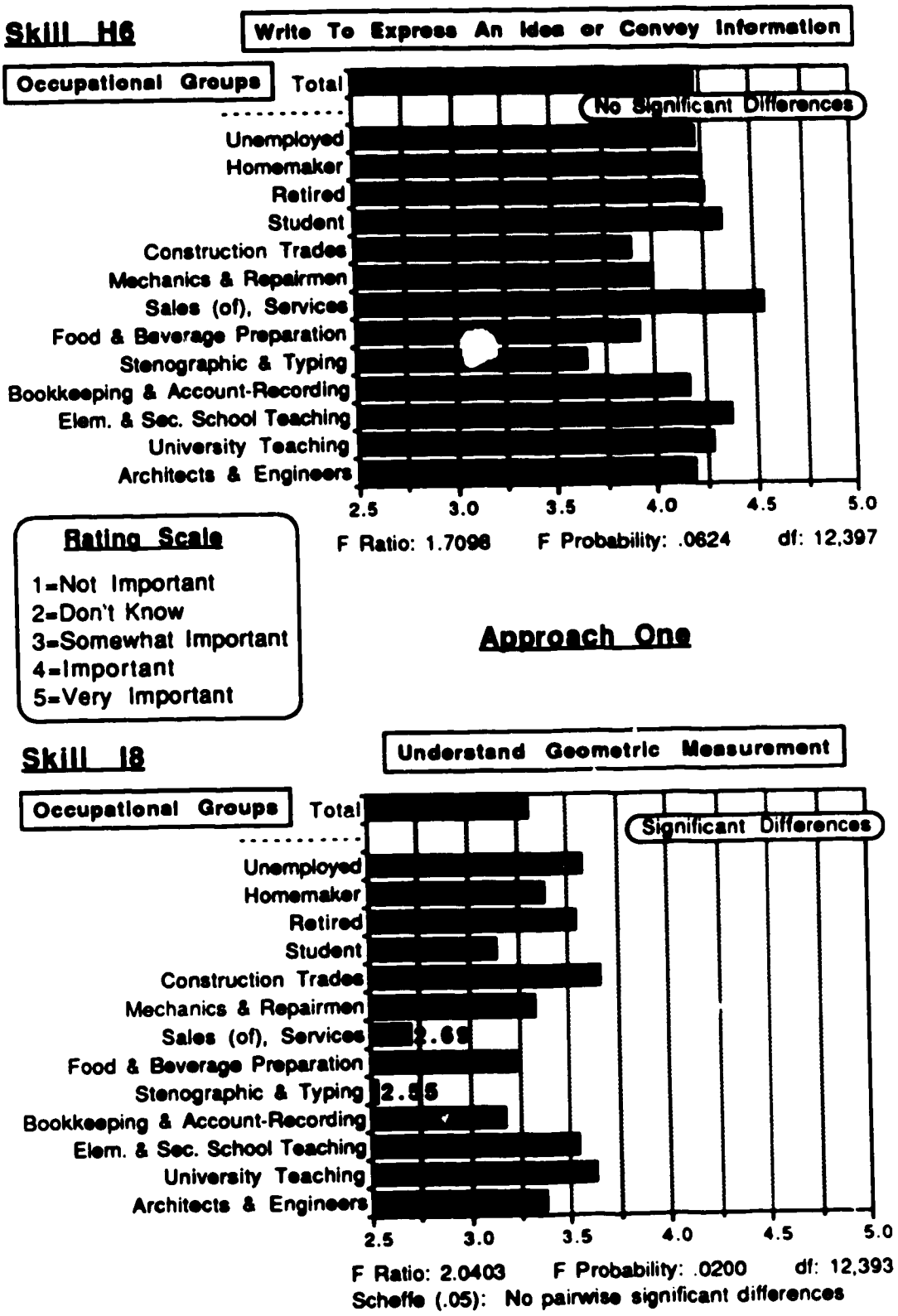

Figure 4. Approach One Results--Skills H6, I8.

Approach Two

Seven Occupational groups were compared on the basis of their evaluations of six Adult Basic Skills in the Approach Two analyses (Appendix C, Figure 3). Significant pairwise differences were indicated by the Scheffe multiple comparison procedure for three of the Skills, at the .05 level. Three of the six Approach Two Null Hypotheses outlined in the Problem chapter were, therefore, rejected. None of the other three Skills showed even an overall (main effect) significant difference. The Basic Skills showing both main effect and pairwise group comparison significant differences are:

A-6: Store and Handle Food Safely

C-16: Develop An Estate Plan

H-6: Write To Express An Idea or Convey Information

The graphs on the following pages show the results of all six Adult Basic Skills evaluation comparisons made in Approach Two.

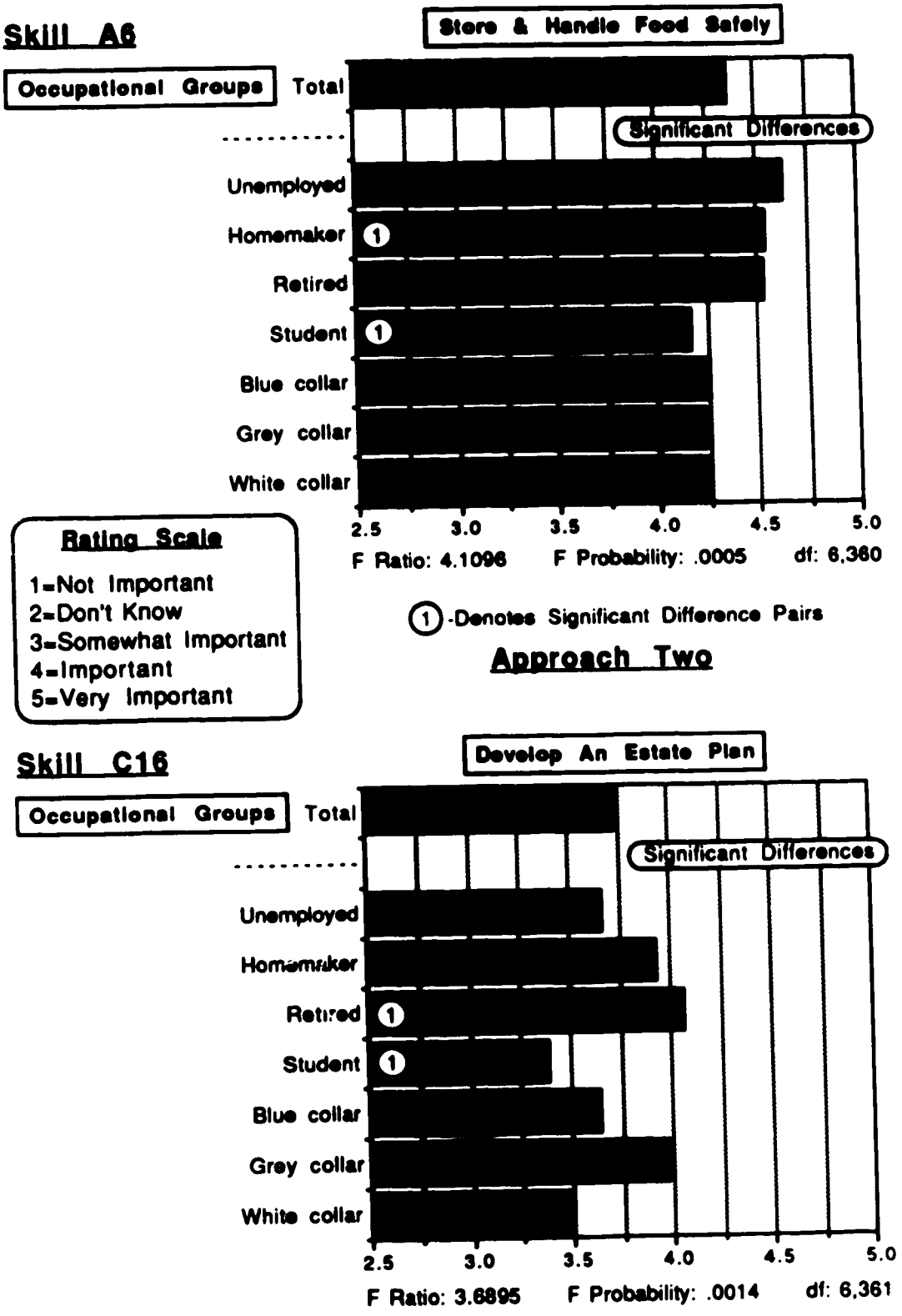

Figure 5. Approach Two Results--Skills A6, C16.

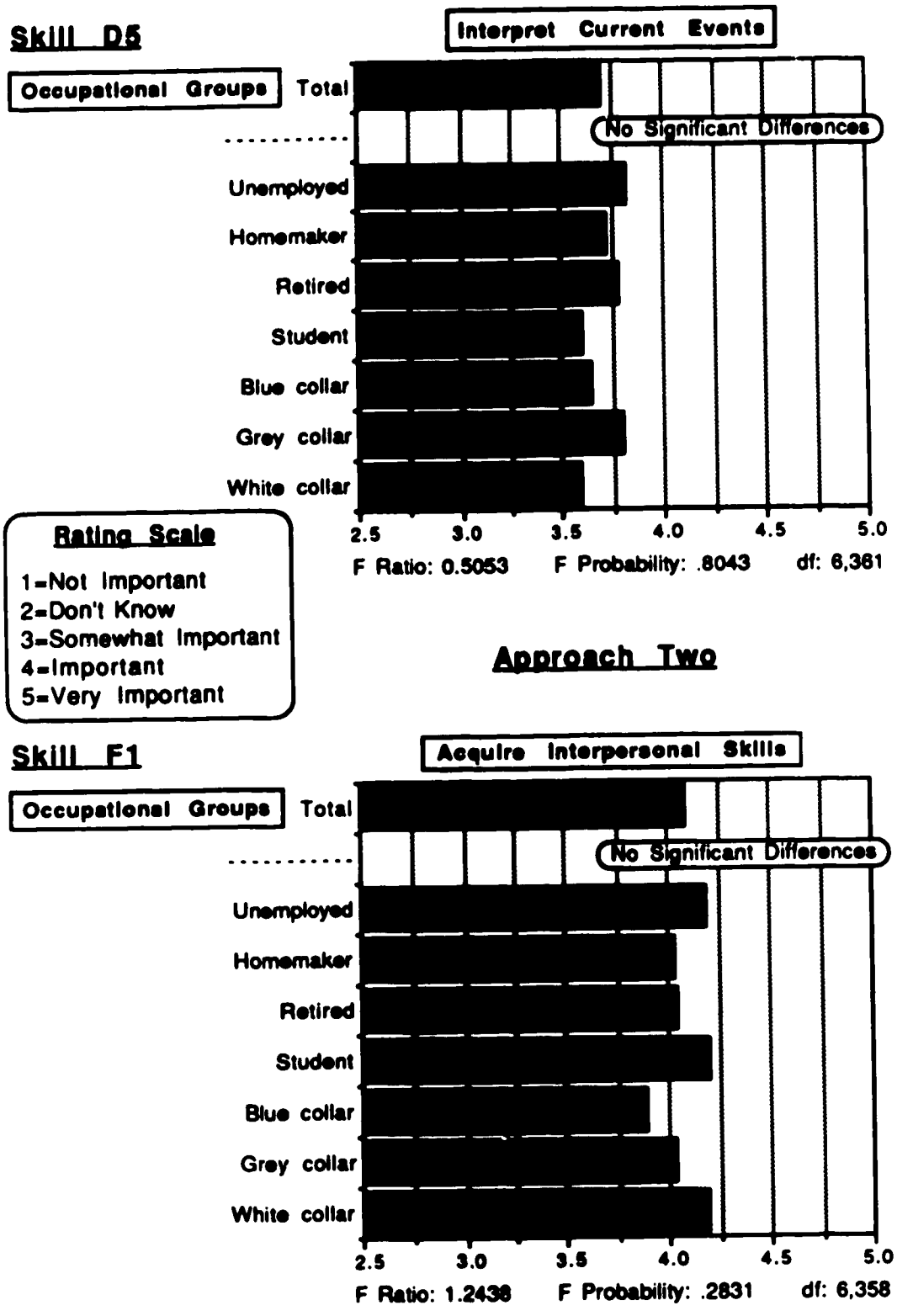

Figure 6. Approach Two Results--Skills D5, F1.

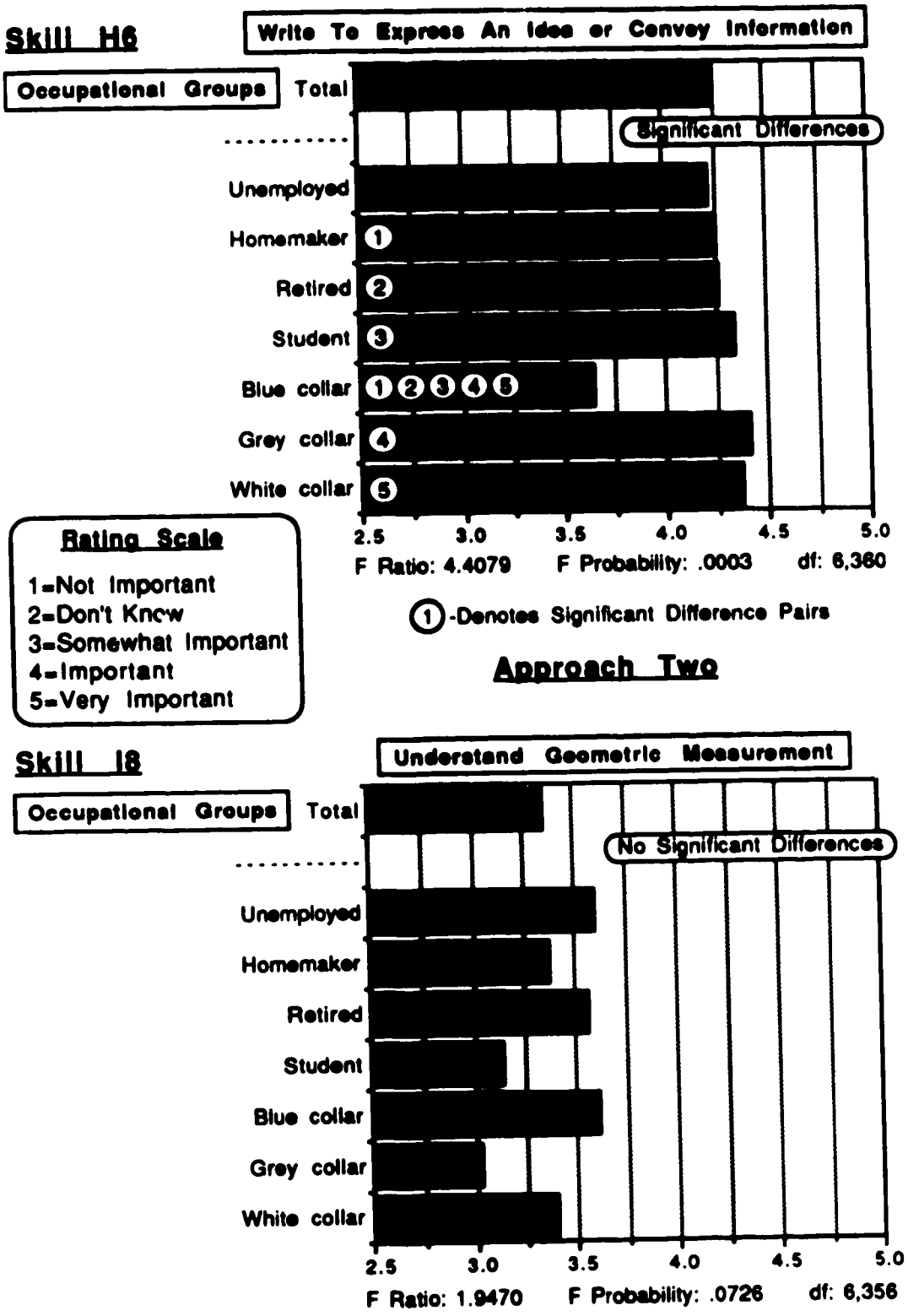

Figure 7. Approach Two Results--Skills H6, I8.

V. Conclusions

The purpose of the research reported here was to test the validity of the occupational influence findings reported in the current Alberta Adult Basic Skills Research Study, begun in 1985. Through involvement with the current Study, and a review of the occupational data-grouping procedures employed, the writer came to question the validity of the Study's findings, which indicated no specific occupational influence on respondent evaluation of the 84 Adult Basic Skills.

Since only the data-grouping procedures of the ABS Study were being questioned, and not the data analysis instruments or methods, this research attempted to repeat the current Study's analyses, but with restructured occupational data-grouping procedures. Consequently, the same statistical instruments and guidelines (e.g., probability level) were employed in this research as were used in the ABS Study. Two basic changes caused this research to differ from the current ABS Study. The first, and most important, was the method used to select members for the comparison groups. This study employed a cluster sampling of the total ABS respondent population, based on the certainty of each respondent's occupational classification. The second change was in the number of Adult Basic Skills being examined. Only 6 of the total 84 Skills were considered in the group comparisons of this research. These two differences are elaborated in the Methodology chapter.

Two separate Approaches were used in this research to restructure the occupational data-grouping of the current ABS Study. Approach One attempted to assure the comparison of distinct, discrete occupational

groups, and departed from the data-grouping combination technique (i.e., the General Vocation categories) of the current Study. Smaller, separate occupational groups (CCDO Minor) were compared for evaluation differences. Approach Two made use of the current Study's General Vocation category combinations, but attempted to reduce the likelihood of group overlap, or data blending, amongst the three categories.

In essence, Approach One was designed to indicate any presence of significant evaluation differences due to respondent occupational perspective, and Approach Two was designed to test the validity of the group comparisons resulting from the current Study's use of General Vocation categories.

The rating scale used by respondents in the current ABS Study to evaluate the Adult Basic Skills is a five-point Likert scale. The labelled scale on which the respondents rated each Skill's importance (for an adult functioning in general society) is as follows:

1=Not Important

2=Don't Know

3=Somewhat Important

4=Important

5=Very Important

The actual scale used by respondents contained only the labels, and was later calibrated for analysis purposes. See the Limitations section of the Problem chapter for a more complete description of the rating scale.

The results from the *post hoc* analysis in Approach One indicated no instances of pairwise significant evaluation differences amongst the specific Occupational groups being compared (Appendix C, Figure 2). There were, however, significant differences found in the overall *main*

effect comparisons in three of the six Basic Skills being evaluated. The Basic Skills showing these significant differences are:

A-6: Store and Handle Food Safely

C-16: Develop An Estate Plan

I-8: Understand Geometric Measurement

This finding supports the implication of the current Study's research, which also indicated no significant pairwise evaluation differences due to occupational perspective. The support is somewhat generalized, since 9 of the 13 specific Occupational groups compared in this research were not used as separate comparison groups in the current Study, but rather formed parts of the aforementioned General Vocation categories. Viewed in isolation, the results of Approach One indicate no significant evaluation differences due to respondent occupational classification, when post hoc pairwise comparisons are made for the six Adult Basic Skills considered in this research. Significant evaluation differences are found, however, when the general occupational picture is viewed in total (i.e., main effect comparisons) for three of the six Skills.

As mentioned earlier, Approach Two utilized the same General Vocation categories as did the current ABS Study, but employed a sampling technique to screen the category memberships. Only one of the six Adult Basic Skills under scrutiny in this research provided any difference from the post hoc pairwise comparison findings of the current ABS Study. Even though three of the six Adult Basic Skills showed pairwise significant evaluation differences, two of these instances were attributable to the non-vocational Employment Status categories (Student, Retired, Homemaker, Unemployed), and had already been indicated by

the current Study's findings. The Basic Skills for which significant differences were indicated are:

A-6: Store and Handle Food Safely

C-16: Develop An Estate Plan

H-6: Write To Express An Idea or Convey Information

Skill H-6 is the only one which showed pairwise significant differences involving the General Vocation categories. Main effect significant differences were also found in only those three Skills already listed.

It is interesting to note that the one case of pairwise significant evaluation difference which had not appeared in the current ABS Study is a rather pronounced one. In its mean evaluation of Skill H-6 (Write To Express An Idea or Convey Information), the Blue Collar General Vocation category rated the Skill significantly lower than all other groups, except for the Unemployed. This means that there are five instances of pairwise significant evaluation differences for that one Skill, and no instances (amongst the General Vocation categories) for any of the other five Skills being considered.

Taken together, the findings from Approaches One and Two would seem to indicate that any Adult Basic Skill pairwise evaluation differences due to respondent occupational perspective are not widespread, and are quite possibly limited to isolated instances, since the six Basic Skills considered in this research were thought to be the most likely to show evaluation differences. As well, the findings seem to indicate that what spotty pairwise evaluation differences there may be are more likely attributable to differences in respondent General Vocation category (e.g., White, Grey, Blue collar) than to specific vocational classification (e.g., Architects & Engineers, Stenographers & Typists). When all

Occupational groups are viewed in total (rather than in post hoc pairs), however, significant evaluation differences are found in half of the Skills being considered.

The difference between pairwise comparisons and total group (main effect) comparisons should be noted here. A collection of items, or events, may demonstrate significance because of their unique combination, or occurrence, together. Yet, when viewed individually (pairwise) they are not significant. Such is the case in the group evaluation comparisons of the Adult Basic Skills reported here. In the Approach One Results just reported, for example, three of the six Skills showed significant overall differences, yet when post hoc (after-the-fact) tests are applied for individual (pairwise) comparisons, no significance is found. Since the current ABS Study concentrates almost solely on the post hoc pairwise comparison results, this thesis is also directed toward those comparisons. The overall (main effect) results are reported here, however, because of their relevance to the more general focus of occupational influence considerations.

Since any conclusions drawn from this research must be based on the six selected Skills only, it is not possible to make a comprehensive judgment on the extent to which similar data screening procedures would alter the entire Profile of Skills evaluation comparisons in the current Study. The one Skill which showed extensive pairwise evaluation differences, however, leads the writer to retain a measure of uncertainty over data-grouping procedures used in the ABS General Vocation categories, since the same Skill showed no significant pairwise evaluation differences when analyzed using the unscreened General Vocation categories of the current ABS Study. The obvious suggestion for further

research into these data-grouping concerns would, of course, be to employ the General Vocation category screenings in the analyses of all 84 Adult Basic Skills. This process might be made less unwieldy by factoring the 84 resultant scales, and then comparing factor scores. Another alternative would be to form sub-dimensions, and then compare the summed ratings within each sub-dimension.

In addition, it would be interesting to learn what effect a predetermined pairwise comparison approach would have on the statistical analyses results of the Study. A post hoc analysis approach, as that taken in the current Study, requires considerably higher pairwise differences for significance. In the case of the seven Occupational groups compared in the Study, the post hoc approach requires six times the differences of a predetermined pairwise comparison. The Approach One analysis of this thesis, if processed with predetermined pairwise comparisons, would have its significant difference levels reduced by a factor of twelve. Although no definite predictions could be made from the work reported in this thesis, it seems fairly obvious that the likelihood of significant differences appearing in the Occupational group evaluation comparisons would be greatly increased if the predetermined pairwise comparison approach were taken.

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Adult Basic Skills (Profile Items)

Category A--Protect/Maintain Health & Safety

A1. Practice Personal Hygiene
A2. Recognize and Act Upon Symptoms of Illness
A3. Use Drugs and/or Alcohol Responsibly
A4. Practice Traffic Safety
A5. Use Emergency First Aid Techniques
A6. Store and Handle Food Safely
A7. Assist in the Maintenance of Health & Safety of the Community
A8. Recognize and Act Upon Unsafe Conditions
A9. Practice Proper Sanitation
A10. Identify and Interpret Safety Symbols

Category B--Earn a Living

B1. Obtain Knowledge of Occupational Options
B2. Assess Own Occupational Potential
B3. Acquire Marketable Skills
B4. Find, Apply For, and Get a Job
B5. Keep a Job (Meet Job Requirements)
B6. Determine If Job Meets Personal Expectations, Responsibilities
B7. Identify with Needs/Roles of Others in Relation to Job
B8. Plan and Manage Occupational Advancement/Development
B9. Understand the Deduction and Benefit Packages Available
B10. Participate in Approp. Job Related Affiliations & Organizations
B11. Plan and Manage Retirement

Category C--Manage Home and Family Responsibilities

C1. Plan and Prepare Nutritious Meals
C2. Plan a Family
C3. Parent Effectively
C4. Meet the Needs of Spouse
C5. Plan a Budget
C6. Implement Budget: Use Banking Services Effectively
C7. Implement Budget: Use Credit Effectively
C8. Implement Budget: Be Effective in Purchasing Goods & Services
C9. Obtain/Maintain Accommodation (Renting, Buying, Building)
C10. Meet Transportation Needs
C11. Meet Insurance Needs
C12. Plan and Use Leisure Time
C13. Maintain Records (e.g., Chequing Acct, Immunization, Health)
C14. Understand, Identify, and Cope with Taxation Process
C15. Manage Mobility (Effect of Moving on Family)
C16. Develop an Estate Plan

Category D--Function as a Citizen

D1. Understand Purpose of Laws and Effects on Individual
D2. Abide by the Law
D3. Seek and Use Legal Assistance as Needed
D4. Understand/Exercise Citizen Rights, Responsibilities

D6. [illegible]
D7. Utilize Community Resources
D8. Assume Responsibility for Individuals with Special Needs

Category E--Develop Self
E1. Motivate Self, Develop a Positive Self Image
E2. Recognize the Need for and Apply Self Discipline
E3. Assert Self (Stand Up for What You Believe)
E4. Be Responsible and Accountable for Own Actions/Behaviour
E5. Recognize Personal Physical Needs
E6. Recognize and Maintain Personal Mental Balance
E7. Recognize and Deal with Emotions
E8. Recognize Influences of Personal Culture, Tradition, & Customs
E9. Adapt to Change
E10. Cope with Crisis Situations

Category F--Relate to Others
F1. Acquire Interpersonal Skills
F2. Recognize Achievement in Others
F3. Respond to and Help Others
F4. Be Accepting of Other's Positions & Compromise Appropriately
F5. Be Considerate of the Morals and Values of Others
F6. Appreciate Cultural Differences

Category G--Learn How to Learn
G1. Develop Confidence in One's Ability to Learn
G2. Manage Self as Learner
G3. Understand the Learning Environment
G4. Utilize Various Learning Methods
G5. Apply Practical Thinking
G6. Recall and Apply Data to New Situations
G7. Apply Problem Solving Technique to Make Rational Decisions

Category H--Communicate
H1. Participate in Verbal Communications, Including Sign Language
H2. Recall Ideas and Information
H3. Read and Interpret Signs and Labels
H4. Read for Comprehension
H5. Interpret Graphical, Pictorial, and Symbolic Information
H6. Write to Express an Idea or Convey Information
H7. Communicate Using Electro Mechanical Aids

Category I--Use Mathematics
I1. Perform Basic Mathematical Operations on Whole Numbers
I2. Perform Basic Mathematical Operations on Fractions
I3. Perform Basic Mathematical Operations on Decimals
I4. Perform Basic Math. Operations on Ratio, Proportion, Percent
I5. Perform Basic Time Conversions
I6. Interpret Charts and Graphs
I7. Understand the S.I. (Metric) System
I8. Understand Geometric Measurement
I9. Use Calculators

Adult Basic, Sub, Specific Skills (examples)*

C16 (Basic Skill) Develop an Estate Plan

C16A (Sub Skill). Manage Personal Assets

(Specific Skills)
C16A1 Inventory Assets/Liabilities for Estate Planning
C16A2 Establish Priorities for the Management of Finances
C16A3 Be Aware of Legal and Financial Resource Services
C16A4 Choose Resources for Management of Finances
C16A5 Draw Up Estate Management Plan
C16A6 Review Estate Management Plan Periodically

C16B (Sub Skill). Plan for Distribution of Assets

(Specific Skills)
C16B1 Determine Legal Rights, Distribution of Assets
C16B2 Provide Valid Will
C16B3 Understand Consequences of Not Having a Will
C16B4 Coordinate Will with Insurance
C16B5 Select Appropriate Executor/Executrix for Will
C16B6 Review Will Periodically

I8 (Basic Skill) Understand Geometric Measurement

I8A (Sub Skill). Demonstrate an Understanding of Plane Figures

(Specific Skills)
I8A1 Identify Simple Plane Figures

I8B (Sub Skill). Demonstrate an Understanding of Perimeter

(Specific Skills)
I8B1 Define Perimeter
I8B2 Find the Perimeter of Geometric Figures
I8B3 Apply Previously Learned Skills to Problem Solving

I8C (Sub Skill). Demonstrate an Understanding of Area

(Specific Skills)
I8C1 Define Area
I8C2 Find the Area of Rectangular Figures
I8C3 Apply Previously Learned Skills to Problem Solving

*Source: *Catalogue of Adult Basic Skills* by Prof. A. K. Deane, Dr. D. J. Collett, and G. D. Kendal (Dep't. of Industrial & Vocational Education, University of Alberta).

Major Groups

11. Managerial, Administrative and Related Occupations
21. Occupations in Natural Sciences, Engineering & Mathematics
23. Occupations in Social Sciences and Related Fields
25. Occupations in Religion
27. Teaching and Related Occupations
31. Occupations in Medicine and Health
33. Artistic, Literary, Performing Arts and Related Occupations
37. Occupations in Sport and Recreation
41. Clerical and Related Occupations
51. Sales Occupations
61. Service Occupations
71. Farming, Horticultural and Animal-Husbandry Occupations
73. Fishing, Hunting, Trapping and Related Occupations
75. Forestry and Logging Occupations
77. Mining and Quarrying Including Oil and Gas Field Occupations
81/82. Processing Occupations
83. Machining and Related Occupations
85. Product Fabricating, Assembling and Repairing Occupations
87. Construction Trades Occupations
91. Transport Equipment Operating Occupations
93. Material-Handling and Related Occupations
95. Other Crafts and Equipment Operating Occupations
99. Occupations Not Elsewhere Classified

Minor Groups (examples)

(from Major Group 41 - Clerical and Related)

411. Stenographic & Typing Occupations

413. Bookkeeping, Account-Recording & Related Occupations

414. Office Machine & Electronic Data-Processing Equipment

415. Material Recording, Scheduling and Distributing

416. Library, File, Correspondence Clerks & Related

417. Reception, Information, Mail & Message Distribution

419. Other Clerical & Related Occupations

(from Major Group 51 - Sales)

513/514. Sales Occupations, Commodities

517. Sales Occupations, Services

519. Other Sales Occupations

(from Major Group 61 - Service)

611. Protective Service Occupations

612. Food & Beverage Preparation & Related

613. Occupations in Lodging & Other Accommodation

614. Personal Service Occupations

616. Apparel & Furnishings Service Occupations

619. Other Service Occupations

Appendix B3

Canadian Classification and Dictionary of Occupations (CCDO)

Unit Groups (examples from Major Group 61 - Service)

(from Minor Group 611 - Protective Service)

6111. Fire-Fighting Occupations

6112. Policemen & Detectives, Government

6113. Policemen & Investigators, Private

6115. Guards & Watchmen

6116. Commissioned Officers, Armed Forces

6117. Other Ranks, Armed Forces

6119. Other Protective Service Occupations

(from Minor Group 612 - Food & Beverage Preparation)

6120. Supervisors, Food & Beverage Preparation & Related

3121. Chefs & Cooks

6123. Bartenders

6125. Waiters, Hostesses and Stewards, Food & Beverage

6129. Other Food & Beverage Preparation & Related

(from Minor Group 613 - Lodging & Other Accommodation)

6130. Supervisors, Lodging & Other Accommodation

6133. Chambermaids & Housemen

6135. Sleeping-Car & Baggage Porters, & Bellmen

6139. Other Lodging & Accommodation

(from Minor Group 614 - Personal Service)

6141. Funeral Directors, Embalmers & Related

6143. Barbers, Hairdressers & Related

6144. Guides

6145. Hostesses & Stewards, Except Food & Beverage

6147. Babysitters

6149. Other Personal Service Occupations

(from Minor Group 616 - Apparel & Furnishings Service)

6160. Supervisors, Apparel & Furnishings Service Occupations

6161. Laundering Occupations

6163. Dry-Cleaning Occupations

6165. Pressing Occupations

6169. Other Apparel & Furnishings Service Occupations

(from Minor Group 619 - Other Service Occupations)

6190. Supervisors, Other Service Occupations

6191. Janitors, Charworkers & Cleaners

6193. Elevator-Operating Occupations

6198. Labouring & Other Elemental Work, Services

6199. Other Service Occupations

Appendix C

Data Groupings

figure 1

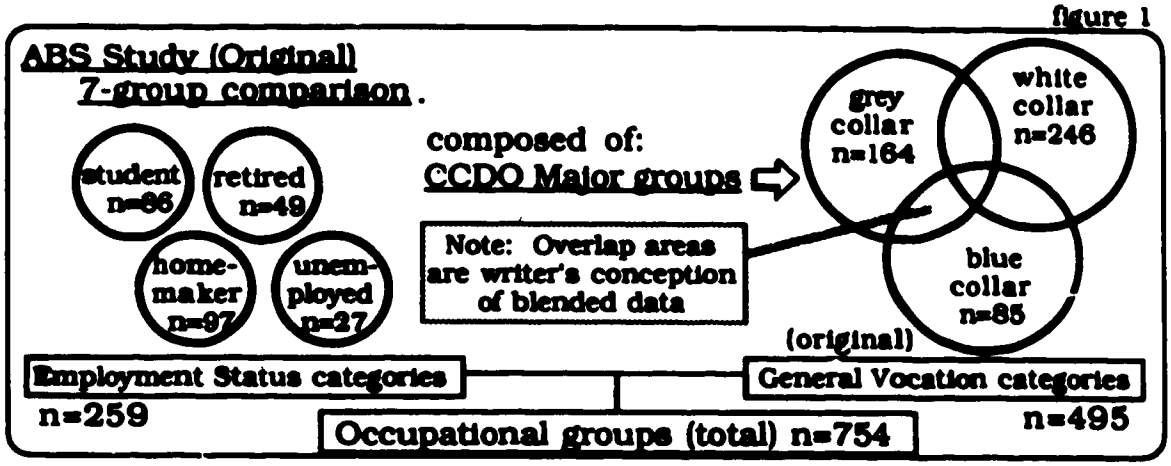


figure 2

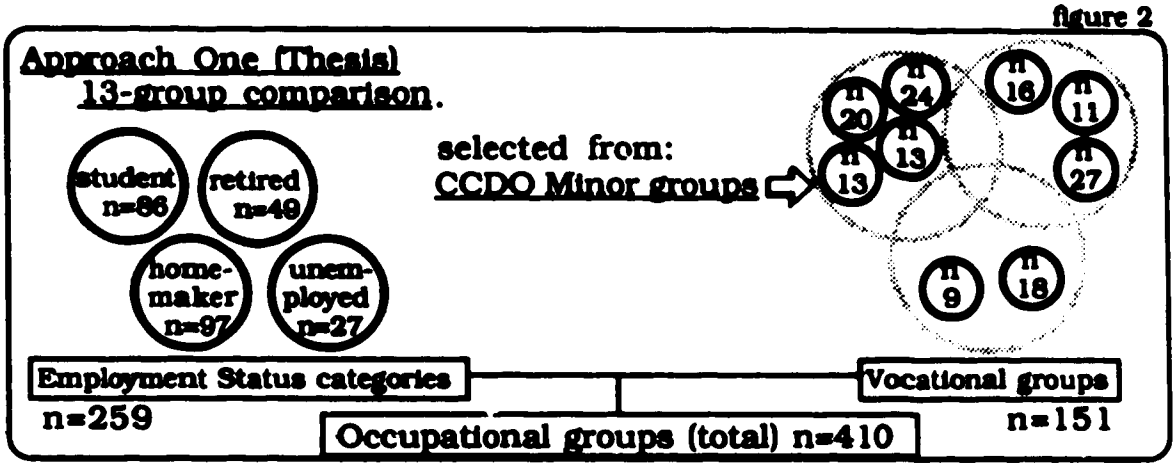
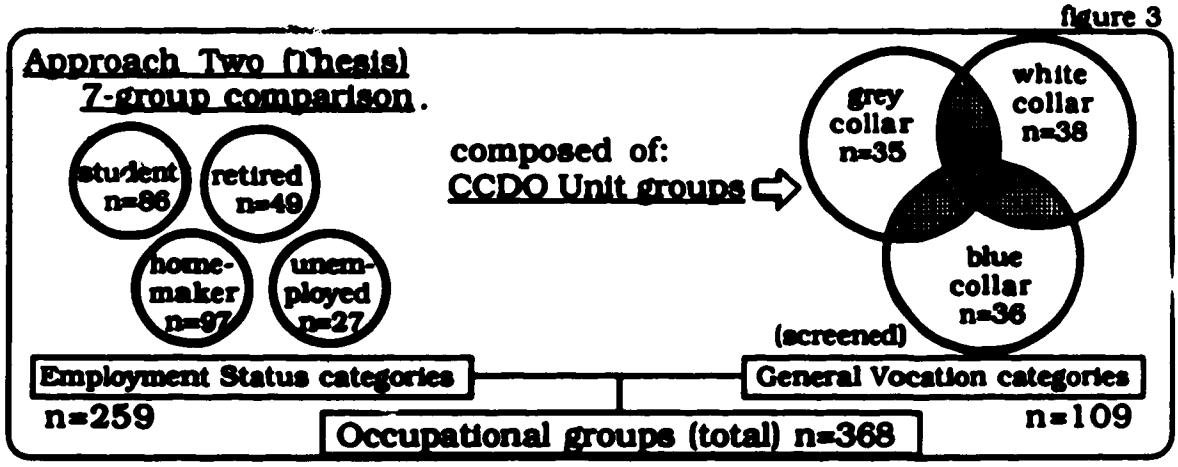


figure 3



Note. Solid circles (any size) represent groups being compared. Shaded areas are not included in the comparisons.

Appendix D

ABS Questionnaire Occupational Items

12. Are you presently:

    ..... an employee

    ..... an employer

    ..... self-employed

    ..... unemployed

    ..... retired

    ..... other (please specify): .....

13. Over the course of your work history, have you usually been:

    ..... an employee

    ..... an employer

    ..... self-employed

    ..... other (please specify): .....

14. Current occupation:

    .....

15. Over the course of your work history, what has been your usual occupation:

    .....

16. When you completed the Profile, from what occupational perspective were you answering:

    .....

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