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## The measurement of occupational interests in China.

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THE MEASUREMENT OF OCCUPATIONAL INTERESTS IN CHINA

A Dissertation Presented

by

SHAOMIN XING

Submitted to the Graduate School of the  
University of Massachusetts Amherst in partial  
fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

May 1996

School of Education

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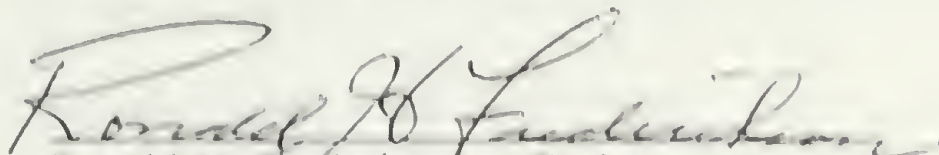
# THE MEASUREMENT OF OCCUPATIONAL INTERESTS IN CHINA

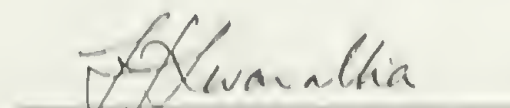
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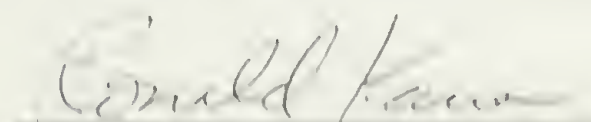
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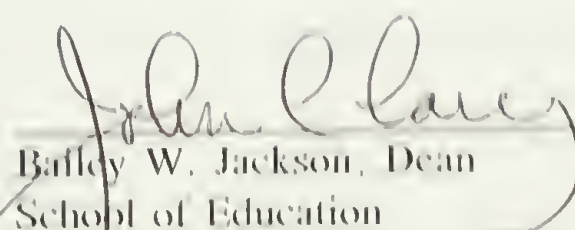
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## ABSTRACT

### THE MEASUREMENT OF OCCUPATIONAL INTERESTS IN CHINA

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The purpose of this research was to commence the development of a Chinese Vocational Interests Inventory (CVII) which will assist Chinese secondary school students in the identification of their vocational interests. The inventory contains 323 items which include a variety of occupational activities and titles. The occupational titles were selected from Chinese Dictionary of Occupational Titles based on the popularity of occupations in PRC and categorized into 11 subgroups which represented a majority of occupational groups. The occupational activities which related to each occupational title were generated and refined from a description of the nature and work activities of selected occupations defined by occupational specialists in Occupational Outlook Handbook published by the U.S. Labor Department (1991). Further design of the study included establishing preliminary reliability and validity of the CVII, and confirmatory factor analysis to identify occupational interests areas. The CVII was administered to 454 Chinese secondary school students who voluntarily



participated in the project. The results of this preliminary study suggested the CVII have reliability ( $r=.98$ ), concurrent validity ( $r=.65$ ) between expressed occupation interests and inventoried interests, and internal validity ( $r=.81$ , occupational title versus occupational activities). Principal-component analysis extracted nine factors from 11 proposed subscales of the CVII. They are labelled as Artistic, Science & Technology, Business, Artistic creativity, Scholastic, Legal, Medical, and Service. The combination of some factors is compatible with John Holland's six occupational categories, indicating to a certain extent universal value of career interests. Gender difference was found in both factors clusters and occupation preference in which female students favored Liberal Art, Performing Art, and other language-expressing related occupations, whereas male students were strongly interested in Science, Engineering, and Mechanical-type of occupations. The homogeneous scales for female students and the combined-gender students were established throughout the factor analyses. More research will be needed to develop homogeneous scales for the male students, and to collect test-retest reliability and predictive validity by using criterion groups in order to develop a menu for the CVII.

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# CHAPTER 1

## INTRODUCTION

### 1.1. Purpose

The purpose of this study was to provide a paper and pencil instrument for measuring occupational interests of high school and college students in the People's Republic of China (PRC). The study primarily focused on the development of items for the Chinese Vocational Interests Inventory (CVII), its content-related validity, and its structure. Secondly, utilizing Chinese high school students as subjects, the researcher tested the reliability and concurrent validity of the CVII. Thirdly, the principal component analyses were conducted to identify certain clusters of interests to form homogeneous scales for both male and female students so that it could serve the purpose of career planning for the students. Finally, differences between the male and female students in their responses to the items of the CVII were investigated.

There is growing demand for career guidance because of the rapid development and changes in the economy and political environment of PRC which promotes individual achievement. However, little research has been conducted on individual assessment either theoretically or empirically to provide career information and guidance to help young people in making occupational choices and career plans. In a college campus student counseling center (in China), the researcher had met a woman whose son would soon graduate from high school, but neither the mother nor the son



had any idea about which college major to apply.<sup>1</sup> However, partial data in a on-going research about ranking of the social-economic status of the occupations offered help. The woman chose physician as her son's college major which was one of the three highest occupations ranked by the college students in three countries (U.S., PRC, and Taiwan) (Fredrickson, Lin, & Xing, 1992). Her son went to a medical school, but I have been wondering ever since whether he was interested in Medicine, what his goals were for life, what motivated him, or did he have necessary knowledge about what medical doctors do. It strikes me how little we had helped the Chinese student in his career plan.

Parental involvement in their children's occupational choice in China is commonplace. It has long been believed that Chinese hold great expectation for their offsprings' academic achievement and career success, mainly to bring honor to their family and ancestors. However, lack of instruments to measure interests and lack of career-related information about self and the occupational world may limit the effectiveness of their potentials.

There is also competition among colleges and universities for attracting the best applicants into their institutions. Like a college day in U.S.A., tables and chairs were set in public places such as a state park or on the sides of commercial streets in some major metropolitan area. College brochures and other material were laid out on the table and normally teachers or directors of certain department would do the talking to people who are around them. This type of expert recommendation might be

1. College major is required to be determined by the students prior to the enrollment.

constructive in some degree for those who had already made their occupational decision and needed detailed information about individual college and university. It is apparent that, this type of consulting can be misleading because of "expert" limitation and bias. Certain specific occupations may be accurately described, but, lack of systematic knowledge about across-the-board occupations could limit a range of choices which may not only limit the individual but also distort the flow of young people into a variety occupations needed by society. Students who have little or no knowledge about occupations are influenced by random events or a convincing recruiter. In a chat with a female friend whose major was costume design, she told me that she was lucky that she hit her career target because she said that she still had an interest in the field after a few years in college. Many of her classmates were unhappy because they had chosen a major they found they were not really interested in. Decisions based on random events are not always bad but lack of systematic information about one's self and world-of-work is a hazard which can be avoided with minimum cost.

Occupational interests have been studied in the Western world since 1920's. Edward Strong, who is a pioneer in this area, described the reason that we should study occupational interests.

The majority of (people) are practically equally fitted to enter a considerable number of occupations. Only exceptional (people) are fitted for some one occupation to the exclusion of all others. The probability is that today most of these exceptional (people) find the one occupation without the aid of a science of vocational guidance. The (people) who need help today are those whose interests are so balanced that they can enter a number of probably more or less related occupations with equal chances of happiness. It is not the ability but interest in the work that the test is designed to measure. Such a test is badly needed since many (people) can do the work at which (they are)

now employed, but will resign very soon because (they are) not interested in it. (Strong, 1927, p. 297)

Following Strong, many other researchers (Bendell, 1941; Borgen & Seling, 1978; Cronbach, 1970; Darley & Hagenah, 1955; Holland & Gottfredson, 1975) have studied the relationship between expressed career interests and inventoried interests. These studies generally concluded that expressed interests might be based on prestige of work, family influence and misunderstanding of occupation. Thus, great caution should be exerted when applying expressed interests only to predicting career direction. On the other hand, inventoried interests stemmed from a large number and a variety of interests items which provided more systematic career information and self knowledge.

In the United States, preference has been given to some form of combination of expressed and inventoried interests in developing occupational interest inventories in order to provide systematic occupational differentiation and knowledge. Occupational interest inventory is considered a very useful, straightforward and economical tool and has been successfully utilized in assisting individual career exploration, career decision, and in predicting future job satisfaction. The assumption is that if people are more interested in their jobs, they tend to be more satisfied with it, to stay longer and probably to be more productive. Thus, by using an appropriate interest inventory, a potential worker can be informed about proper occupational entries based on his or her higher scores on the occupational scales compared with scores of occupational scales of those who are employed in a particular job for a certain period of time and are satisfied with it.



Because of the differences in culture, race, social, economic and political systems, a pragmatic approach is needed to develop a unique Chinese occupational interests inventory.

## 1.2. Significance of the Study

The People's Republic of China has undergone a tremendous change in its economic and political system since 1978 when the ex-general secretary Deng Xiao-Ping called for nationwide economic reform. For the last 17 years, there has been gradual decentralization in both the economic and political systems. Market driven economy is replacing traditional state-planned economy in many regions. There is also a major change in self-value concept-a shift from collectivism oriented values to more individualistic oriented values. The economic and political reform, mainly power sharing with provincial governments, provided more opportunities and freedom for individuals. As a trend, individualism gradually merged into the mainstream of the society, new concepts such as self-actualization, individual achievement, self-interest, etc. have drawn more and more attention from common folks. Employment picture also shifted drastically from government assignment of an occupation to public recruitment. As consequences of all these major shake-ups, the need has increased for research and empirical instruments to study and measure a path which leads to individual success and job satisfaction (Mao, 1991, Shang, 1989). Chinese people are now beginning to search for the jobs which would best fit their interests and abilities (Tang, G., 1990). Interest is one of the factors that needs attention.

Unlike the United States, the measurement of occupational interests in China has not been conducted, although China has begun its industrialization since 1840. The highly centralized government and its full-employment policy in the last few decades had discouraged individual assessment and choices. Until a few years ago, majority of Chinese students who entered their career through college were very much driven by high social status and privilege as it had been in the past, and because there were narrow marginal differences in salary, individual needs, interests and satisfaction were ignored, and even criticized by the central government, media and community at large.

In general, the interest inventory may directly benefit high school students who, through using the inventory, can explore and identify their occupational interests, and prioritize their preferences. In a large sense, the research attempted to fulfill the gap in occupational interest domain in China, which include different interests patterns of men and women, differences in occupation preferences between boys and girls, and issue of expressed versus inventoried interests. Such research topics will be discussed in the following section.

### 1.3. Research Questions

This study was designed to begin the preliminary work for the development of an occupational interest inventory suitable for high school and college students in PRC. The following research questions guided this effort.

1. How can the items differentiate from each other? How can the items selection minimize the item overlapping? Item discrimination and its overlapping rate have long been considered as a key criterion for construct validation of occupational interest

inventories. The inventory takes into consideration that the items should differentiate from one to another as much as possible. The principles used in development of occupation related activity items of the inventory attempted to answer this question.

2. Are there any interest patterns or group of items which differentiate certain occupational categories, and are there any similarity among these groups? Are there any differences within the occupational categories between boys and girls? Again, the questions can be best answered by the item differentiation analysis which would lead to the establishment of homogeneous scales. Principal component analysis model was used to respond to this second question. The research was to identify independent factors based on the male, female and combined students samples.

3. Are there any discrepancies between expressed career interests and inventoried career interests? And are they different in boys than in girls, if there is any? The researcher investigated the relationship between the occupational specific activities versus the occupational titles in both the male and female students. In addition, expressed occupation preference which the subjects listed on the information questionnaire was compared with scores on the occupational activity items. This was used to test the concurrent validity of the inventory.

4. How reliable is the inventory? The subjects' responses toward each item should show its internal consistency. Cronbach alpha reliability test was conducted to answer this question.

5. Do male and female students in China differ from each other in their preferred occupations? The researcher compared the response percentage of each items and subscales between the male and female student subjects.



## CHAPTER 2

### LITERATURE REVIEW

#### 2.1. The Nature of Interest

What are the precursors of people's occupational interests and references in the United States? Studies (Moloney, et al. 1991; Lykken, et al. 1993) designed to examine the magnitude of genetic and family environmental influences of vocational interests of adult twins reared apart suggested that approximately 40% to 50% of the variation in vocational interests is genetic in origin. The authors propose a model in which precursor traits of aptitude and personality, in part genetically determined, guide the development of interests through the mechanisms of gene-environment correlation and interaction.

Interest, according to Edward Strong (1943), is the awareness of our disposition of liking and disliking the object and an activity toward or with the object. Interest is sometimes attached to an activity in terms of some trivial aspect. But some general interests are attached to the names of occupations. Therefore, two different kinds of interest may be identified, uninformed interest and intelligent interest. Uninformed interest is related to a reaction to the things as a whole without awareness of a distinct liking or disliking. Informed interest involves several components and a person knows he or she likes certain parts, dislikes certain parts, or is indifferent to certain components. While not everyone likes all aspects of an occupation, generally, people who select, prepare and stay in certain occupations tend to like most major parts of the occupation activities (Strong, 1943). However, many people who stay in an occupation

or students who continue their major related to their interests do not really enjoy the activities of the job, but the occupational title is far more important to them. This also raises question of validity of expressed choice. According to Strong, expressed choice for a vocation cannot be accepted as proof that this is the occupation the student should enter. It must be explained carefully through measurement instruments which assess comprehensively an individual's abilities and interests.

The conventional view about career-relevant traits holds that interests and abilities are separate and generally unrelated (D. Jepsen, 1992). However, Randahl (1991) conducted a typological analysis to test the relationship between measured interests and abilities. The study found that both interest and ability profiles differed across interest types, suggesting that interest and ability are related, and both contribute to predictions of which occupational groups may be satisfactory. Studies (Carp, 1958; Schletzer, 1966; Schweiker, 1959; Zytowski, 1976) have found low correlations between interest scores and ratings of job satisfaction. Part of the reason is the very small variance in satisfaction among groups with homogeneous interests. A six-year study (1972 to 1978) of job satisfaction (Weaver, 1980) revealed that 88% of American workers stated that they were somewhat satisfied or very satisfied with their job. Consensus on the correlation coefficient between interests and satisfaction are on the positive side (Lipsett & Wilson, 1954). Interest indicates satisfaction better than abilities or achievement (success) mainly because both concepts are relatively more subjective than abilities and achievement (success), the latter more reflective of other's judgement toward one's performance. On the other hand, an activity may be liked or

disliked long after it has ceased to be carried out. Therefore expressed likes, or dislikes do not guarantee that they will lead to comparative achievement.

Edward Strong illustrated the relationship among interest, ability and success as a motor boat with a motor and a rudder. The motor (abilities) determines how fast the boat can go, the rudder (interest) determines which way the boat goes. Success is the distance traveled in a straight line in a given interval of time. Wyman's research findings (1925) supported this analogy. The results show that the most successful child is highly intelligent and highly interested. Some children who are not highly interested have succeeded, but they are highly intelligent. However, some highly intelligent, but not highly interested, have not succeeded; and finally, some with lower intelligence and not a high degree of success are highly interested.

Another aspect of the occupational interests study is its stability. An individual's occupational-interest measurement has been found stable over time. Using both cross-sectional and longitudinal methods, researchers (Strong, 1943; Johansson & Campbell, 1971) have shown that occupational interests are consistent over time. This was done across age (not including children) and sex. Correlation coefficients of above studies ranged from .60 to .90. According to the authors, interests are stable even at relatively young ages of 15 or 16 years. By age 20, the stability of interests is obvious even over test-retest intervals of 5 to 10 years, and by age 25, interests become very stable. These findings are also in agreement with Strong's statement in his 1943 book "Vocational interest of men and women". He stated, "...occupational interest scores do not increase with occupational experience, they actually decrease slightly. Young



people possess clear-cut occupational interest prior to any educational or occupational experience" (Strong,1943).

Two major issues in measuring interests are similarity and differentiation. Based on the data he collected from previous studies, Edward Strong (1943) concluded that there are more striking similarities than differences among groups across age, sex and occupations. However, most of these high correlations are contributed from the subtests of his Vocational Interests Blank, they are "kinds of people", "amusement", and "ability", which apparently have more common characteristics than differences. The question of item differentiation is far more important than similarity in vocational interests inventory. There are several issues in item differentiation, item overlapping<sup>1</sup> rate, differentiation among different groups, ways to decide differences in groups. Strong found that the overlapping is inevitable, and the average rate in his instrument is 38%. Technical details of this matter will be discussed in a later Chapter of this research report.

Gender difference in career interests has long been noticed and attracted a great amount of research in developing interests inventory. After attempts to develop combined-gender scales, researchers (Strong, 1943; Hansen, 1976; Kuder, 1977) had generally arrived at the same conclusion: that many occupations separated-gender scales were more valid than combined-gender scales. They argued that men and women report different interests, and these differences emerge in early childhood and persist

1. Overlapping means the degree of correlation between one item and others (Strong, 1943)

into adulthood. Hansen (1978) attributed these differences to cultural factors. She found men scored higher in the Realistic area and women scored higher in the Artistic area. Further, she examined data collected over a period of 50 years, and found stability of gender differences in interests (Hansen, 1988).

## 2.2. Interest Inventories and Their Construction

The earliest work on standardized interest inventory was done by Clarence S. Yoakum in 1919. At the Carnegie Institute of Technology, he developed an item pool of over 1000 items in a seminar. E.K. Strong, Jr. also participated in the Carnegie project. In 1921, the Yoakum seminar condensed several interest inventories that had used samples of the seminar items into the Carnegie Interest Inventory, which is considered by many to be the first standardized interest inventory.

Versions of the original Carnegie Inventory included the Occupational Interest Inventory (Freyd, 1923), Interest Report Blank (Cowderyt, 1926), General Interest Survey (Kornhauser, 1927), Vocational Interest Blank (Strong, 1927), Purdue Interest Report (Remmers, 1929), Interest Analysis Blank (Hubbard, 1930), and Minnesota Interest Inventory (Peterson, et al., 1930).

The original 1000-item pool from the Yoakum seminar was developed using a rational sampling approach, meaning that the item selection procedure did not involve any statistical analysis of the items but rather was an attempt to write items representing the entire domain of interests. Later investigators worked to identify, through statistical analysis, the worth of the original items in terms of the degree to

which the items discriminated between the like, dislike, and indifferent responses of subjects from various occupational groups.

### 2.2.1. Methods of Scale Construction

Two kinds of scales have been used to measure interests, heterogeneous scales and homogeneous scales. Occupational scales developed using the empirical method of contrast groups are called heterogeneous because items selected for the scales have low correlations with one another. Strong, Jr. (1927) developed a technique designed to identify the items that discriminated specific occupations from people in general. Another type of heterogeneous scale construction, developed by Kuder (1966) for the Kuder-DD, compared the individual person's response pattern to responses of criterion samples composed of subjects from various occupations and college majors.

The other kind of scale used frequently for measuring interests is the homogeneous scale, which contains items that have high correlations with one another. Factor analysis and principal component analysis may be applied to identify related items which have higher factor loading than the rest from the item pool to form homogeneous scales. The Kuder Preference Record (Kuder, 1939) was one of the first widely used inventories to have homogeneous scales. Clark (1961) combined the construction techniques of the heterogeneous scales of the SVIB and the homogeneous scales of the Kuder when he developed the Minnesota Vocational Interest Inventory (MVI). Campbell also combined homogeneous and heterogeneous scales in one inventory when he added the 23 Basic Interest Scales to the SVIB, through factor analysis. Holland's Self-Directed Search (1971) and the General Occupational Themes



(Campbell & Holland, 1972) are also considered homogeneous scales because they are developed by rational selection of items. For rational scale construction, theory is used to determine which items in the pool are appropriate for each scale.

In summary, heterogeneous scales have better validity in predicting occupational choice, but homogeneous scales can be useful in exploring an individual's interests within their own ipsative framework as they relate to his or her life style. Both heterogeneous and homogeneous scales provide a system of checks and balances that allows an individual to identify interests in a general way through homogeneous scales and define a specific occupational interest using the heterogeneous scales.

#### 2.2.2. Strong-Campbell Interest Inventory

Despite its tradition and 60-year history, the Strong interest inventory has undergone remarkable expansion and revision in recent decades. However, it still has retained as its core E.K. Strong's (1927) innovation of empirically-based occupational scales. The original SVIB (Strong, 1927) included only ten Occupational Scales, constructed with the empirical method of contrast groups, which compared the interests of an individual to the likes, dislikes, and indifference of men already in various occupations. A women's form of the SVIB was published by Strong in 1933. Under David Campbell's leadership, the 1974 Strong-Campbell Interest Inventory (SCII) was revised to merge the Women's and Men's forms of the inventory, adding Holland's typology as an organizing feature, and adding homogeneous content-base scales. Thus, SCII was constructed like a pyramid. At the bottom line, we can see the 162 heterogeneous occupational scales developed originally by Strong in 1927 and in

1933; in the middle is Campbell's contribution, the 23 Basic Interest Scales (BIS) which were developed by cluster analysis of the SVIB items, each BIS focuses on the measurement of only one area of interest. Superimposed on the BIS are Holland's 6 General Occupational Themes (GOT) which were developed using rational scale construction.

The 1985 revision of SCII is the latest modification. With 325 items, the new revision is sex-balanced scales with career options for women and men. It remains the same numbers of GOT and BIS (which are referred as homogeneous scales) as the 1974 revision, but added Occupational Scales (empirical scales) up to 207 including noncollege occupations. All of this was accomplished with restandardization, which was based on 48,238 satisfied workers in 207 occupational categories.

Strong's rationale for item selection included the following principles:

1. The popularity of the item varies greatly from occupation to occupation.
2. The content of each item is related to the occupations endorsing or rejecting it.
3. The item must vary in their characteristics, especially average popularity and in the range of spread they create among the occupational samples.
4. For the most part, the items are stable over time.
5. Male and female samples, even in the same occupation, give different responses to many items depending upon gender.
6. The shape of the item-response distribution varies from one item to the next (but which distribution shape is best is not clear) (Hansen & Campbell, 1985).

The test-retest method was used to test reliability because of the nature of heterogeneity of the empirical construction of Occupational Scales. Median re-test

reliability for the 1985 Occupational Scales was .92 for two weeks, .89 for thirty days, and .87 for three years. Median reliability for the GOT, BIS, and Special Scales ranged from .81 to .91 over similar periods.

The suggested predictive validity of the Occupational Scales for the current version has yet to be collected. However, longitudinal studies of earlier versions of the Strong showed that the typical hit rate is 60-75 percent that college students will enter occupations predictable from their earlier scores.

Concurrent validity regarding the capacity of occupational scales to differentiate people for the current version is also available. The median overlap for all occupational scales is 36 percent (Hansen & Campbell, 1985), which can be considered a very adequate level of this kind of concurrent validity (Borgen, 1988).

### 2.2.3. Kuder Interest Inventories

In 1939, Frederick Kuder published his Personal Preference Record-Personal, Form A, which included seven almost independent homogeneous scales. The items for it were originally organized on the basis of content validity and later by item analyses. He added two more homogeneous scales in 1943 (Form B) and then another one (Form C). Form D of Kuder Preference Record, which is out of print was the last revision of the KPR. The scales in both Form D and Form E, a form specifically designed for junior high students, included: Outdoor, Mechanical, Computational, Scientific, Persuasive, Artistic, Literary, Musical, Social Service, and Clerical. The eleventh scale is the Verification Scale, designed to determine the sincerity of the responses.



In 1966, employing the same items in the Form D, Kuder published the Occupational Interest Survey (KOIS), also known as Kuder-DD, which measures interest in occupations and college majors. The 1985 revision of the KOIS Report Form is divided into four sections: Dependability scales; Vocational Interest Estimates (VIE), which included the same ten scales as the previous forms; the College Major scales, which contained 39 college majors; and 104 occupational scales. Students are required to mark their most preferred and least preferred activity for each of 100 triads written in sixth-grade reading vocabulary. The test results are presented as Lambda coefficients of Biserial correlation; they represent the degree to which the individual's responses to the inventory are like the responses characteristic of each of the criterion groups.

KOIS's items were developed using the following criteria:

1. The inventory should include a representative and systematic sampling of as many relatively independent and relevant vocational and personal interest areas as possible. Effort should be made to keep the centroids of all interest areas with minimal correlation between them. Items are considered relevant if they represent sample areas that have already been found to be related to occupational choice or job satisfaction.
2. The inventory should be completed within approximately half an hour with vocabulary of sixth-grade level. It is better to sample a large number of relevant areas than to obtain large samples of only a few relevant areas.
3. Reliability within groups is of secondary importance, because the items are designed to differentiate between occupational groups.

4. Occupational titles should be avoided so that title attractiveness may be kept to a minimum. The underlying rationale is that students or examinees are inclined to overemphasize the face value of occupational titles.
5. Activities should be generally well understood.
6. Items that the respondent might consider too personal, emotionally disturbing, or offensive should not be included.
7. The instrument should employ a stable item format, relatively free from response bias (Kuder & Diamond, 1979).

Varied test-retest correlation coefficients across the KOIS four scales imply high reliability. Correlations ranged from .84 to .92, demonstrating a high degree of consistency for the scales involved.

Concurrent validity is considered satisfactory. Kuder's methodology for evaluating interests represents an important advancement. The comparison of a student's interest pattern to those of various college major and occupational groups, using Lambda coefficient instead of using a general reference group, has improved the differentiation among occupational groups over previous inventories. According to Kuder, under his new system, the average number of errors of classification for the entire study amounted to 5.7 percent. This corresponds to an overlapping of approximately 11.4 percent; that is, about 5.7 percent of the members of each of two groups received a higher score on the scale for the other group than on their own scale. On the other hand, the median overlap for the scales in Strong's system reported in the manuals ranged from 30 to 35 percent.

The predictive validity data reported used occupational membership as a criterion rather than occupational satisfaction (Jepsen, 1988). A follow-up study was conducted for many years with 882 subjects involved, and historically, 51 percent were employed in an occupation that would have been suggested to them by scores on the KOIS scales (Zytowski, 1976).

The content validity is not only reflected in Kuder's rationale to develop the items (Kuder, 1977) but in the intercorrelations of scores based on the items representing each of the interest areas. Only 4 of the intercorrelations, among 136 ( $17 \times 16 / 2$ ), were above .30 (Kuder & Diamond, 1979).

Seven factor analyses were conducted between 1963 and 1976. The first factor analysis had originally been undertaken for the purpose of classifying occupations. Fifteen principal factors were extracted on the basis of the intercorrelation matrix derived from the response proportions. Of the 15 factors, 3 were not easily identifiable. The other 12 were identified as follows: Best Impression; Femininity-Masculinity; Skilled Trades; Behavioral Sciences; Artistic; Scientific-Mathematical; Sales; Youth; Literary; Medical; Religious; and Outdoor. The last factor analysis was conducted by Zytowski (1976). Using Lambda scores, he found 11 factors from male scales and 9 from female scales. However, as Kuder indicated, classification of occupations, whether on the basis of factor analysis or on the basis of intuitively perceived similarities, or on the basis of the Dictionary of Occupational Titles classifications, is seldom clear-cut and may lead to erroneous interpretation. Many occupations had significant loadings on three or four factors, and some on five (Kuder & Diamond, 1979).



#### 2.2.4. Holland's Interest Inventory

Unlike the theoretical construction of the SVIB-SCII and KOIS-DD Occupational Scales, development of the Vocational Preference Inventory (VPI) was based on a psychological rationale initially proposed by Holland (1959). This was later enlarged and expanded into his theory of careers. After examining the relationship between the vocational interest and personality factors, Holland constructed scales to measure each of the factors by using occupational titles as items. The original seven scales were Physical Activity, Intellectual, Responsibility, Conformity, Verbal Activity, Emotionality, and Reality Orientation.

As a standardized instrument, the SDS was constructed using Holland's career theory as the basis. This assumed that the vocational choice process should involve a consideration of an individual's competencies, preferred activities, and self-ratings of abilities along with vocational interests. It consists of two booklets, the self-assessment booklet and an occupational classification booklet (the Occupations Finder). The self-assessment booklet includes two self-ratings in six personal trait areas and six scales in each of three sections: Activities, Competencies, and Occupations.

The internal reliability (alpha) coefficients of the summary scale range from .84 to .92 (Holland, 1985). Alpha estimates range from .59 to .92 and centralize around .80s for the subscales of the SDS.

Predictive validity was reported in a three year study in which 43 percent of the male participants and 66 percent of female participants entered occupations which were consistent with their occupational choice reflected in their SDS. In his study, McGowan (1982) reports that 73 percent of the vocationally undecided high school

seniors had received summary codes on the SDS that predicted their occupational choices four years later. Crites (1978) raised different questions about the hexagonal model and questions the construct validity of the SDS.

### 2.3. Limitation of previous interest inventories

Overall, SVII, Kuder-DD and SDS, three major occupational interest inventories developed in the United States have set precedents for more studies in the future in the U.S. as well as in the world. Ample information and many classic research methods were provided throughout the continuation of the research of these inventories.

However, there seems a similar vulnerability in item development for the different forms of interest instruments discussed previously in this chapter. They all seem to lack content validity. SCII is known as one of the best interest inventories in the world. Although the inventory items themselves seem to be rationally conceptualized, well categorized, and carefully worded, they originally emerged as result of random selection (Yoakum seminar of 1919). The items then were refined, screened, and tested based on the criteria of percentage of like or dislike of "men in general" group. Great amount of work was dedicated to the predictive validity, and construct validity of the inventory. However, the validity of the original items, which were developed with solid background and tradition related to the Yoakum seminar, has rarely been asked. In addition, an average 35 percent overlapping between the items is arbitrarily justified by arguing that overlapping is inevitable. It may be necessarily true that item overlapping is inevitable, but if item overlapping can be reduced, the ability of items to differentiate from each other should increase. However,

to differentiate from each other should increase. However, we may need to recognize that different occupations may not be as differentiated as we had hypothesized.

Historically, Kuder's inventory adopted a new philosophy. Utilizing triads format Kuder focused on the differentiation of one's own interest pattern. It very well avoids problem with item response sets, but may as well limit choices. In his item development, Kuder tried to "include a representative and systematic sampling of as many relatively independent and relevant vocational and personal interest areas as possible" (Kuder & Diamond, 1979). It was a sound philosophy but he did not mention how to accomplish it.

The occupational interest items are best structured in John Holland's Self-Directed-Search (SDS). Items in SDS are categorized according to his theoretical framework, and they describe activities around the themes. For instance, "Influence others", "Take care of children", and "Fill out income tax forms". However, these items seem to be too general to represent the variety of occupational activities related to certain occupation, and a high overlapping rate should be expected.

An alternative form of occupational interest inventory should try to apply more systematic approach in developing items, other than rational sampling. Items can instead be generated through authoritative descriptions about major job activities of most widely held occupations, and those occupations themselves. Also, by using those specific job activities it will presumably increase the discrimination power compared with more general activities. This type of vocational interests inventory should also be gender-specific, and should cover the major occupational titles in the chosen



occupational areas. Chinese Vocational Interest Inventory is conceptualized with this approach. The detail will be elicited in the Instrumentation section of Chapter 3.

## CHAPTER 3

### RESEARCH METHODS AND PROCEDURES

#### 3.1. Introduction

The objective of this study was to complete the initial development and preliminary testings of a Chinese Vocational Interests Inventory (CVII), which might be helpful to a young adult Chinese population in identifying vocational interests. This would also be helpful to young people in career planning.

Chinese Vocational Interests Inventory (CVII) was developed by this researcher based on certain assumptions and guidelines. These will be described later in this chapter. The CVII, instrument containing 323 items was subsequently revised based on initial feedback of the interviewed Chinese students and consultation with vocational experts. Four hundred and fifty four (454) Chinese high school students participated in this research project and completed the inventory. Using this student sample, the researcher obtained the Cronbach alpha reliability and concurrent validity that was based on the relationship between expressed interests (occupational titles) and inventoried interests (occupational activities). Although heterogeneous scales based on criterion groups (individual occupation scales that provide concrete information regarding the extent of similarity of certain occupational interest) were not of interest at this initial stage of the study, homogeneous scales which serve the general purpose of career exploration for the Chinese students were defined through the principal component analyses. Gender differences were illustrated in the students' preferred occupational titles, and factors resulting from principal component analysis. Preference

of the occupational titles of this study were also compared with rankings of social-economic status of occupations previously investigated. This will be discussed in Chapter 5.

### 3.2. Instrumentation

Chinese Vocational Interests Inventory (CVII) was developed by this researcher to differentiate among occupational interest areas in China. Occupations in China are divided into eight (8) general categories according to China Statistic Bureau. They are: (1) Professionals and Technicians, (2) Leaders of State Organs, Parties, Mass Organizations, and Enterprises, (3) Office Workers, (4) Commerce Workers, (5) Service Workers, (6) Workers of Farming, Forestry, Animal Husbandry and Fishery, (7) Manufacture Workers and Transportation Workers, and (8) Other Workers. These eight groups, especially the Professionals and Technicians group, can be re-classified into 11 subgroups under which there are 84 specific occupations (see Appendix A). Among them, 65 are from the Professionals and Technicians group, and the rest are derived mainly from Service workers sector. This classification is based on task-function, and worker requirements of the different occupations. These task-functions and worker requirements provide an empirical base from which items for the CVII were developed.

According to the 1985 National Census in China, approximately 26.5 millions people (male=16.3 millions, female=10.2 millions) are employed in the fields of profession and technology. Seventy eight percent of college graduates are employed as professionals and technicians.



Because most of the college students, as well as high school graduates, will be working in the future in one of the 84 professional and non-professional occupations, it is appropriate to develop items for an interest inventory which would focus on job activities and occupational titles within those occupations.

Contrary to the "rational sampling", the item selection method adopted by both Strong and Kuder in order to cover the entire domain of interests (occupational and non-occupational), the item selection in the CVII primarily focused on occupational titles and related occupational activities. Any items which did not meet the criteria of specificity, representativeness, simplicity, and uniqueness were not included in the homogeneous scales.

### 3.2.1 Guidelines

Several guidelines and rationale have been conceptualized for the item development process and are briefly presented as follows:

1. Items included a representative sampling of 84 occupations which were mentioned in professional-technical category. Items of occupational activities were constructed through the description of Chinese DOT.1988, and U.S. Occupational Outlook Handbook, 1991. Each activity item is designed to particularly, if not exclusively, represent typical activity of the given occupation. The items were to be as independent as possible from each other. Low correlations among the different occupations group or clusters should result.

2. Detail oriented job activities and the 84 occupation titles are the two major components of the inventory. Activities should be generally well understood by all Chinese high school students.
3. The items were kept as neutral as possible, and effort was made to avoid extreme attitudes towards the items, so that there would be about equal responses of acceptance and rejection.
4. Items were written so students could respond Strongly Like, Like, Indifferent, Dislike and Strongly Dislike. This would hopefully permit an individual to make a clear differentiation of his or her unique preference.
5. The final number of items should be limited to about 300. Testing time should not exceed 45 minutes for most students.
6. Language level of items should be at the 6th to the 7th grade reading level, since the inventory will be primarily utilized for the high school and college students.

### 3.2.2 Content of Items

There were 323 items in the original form of the CVII, however, it was expected that this number would be reduced to approximately 280-300 after item screening. New items may be needed to replace the items that are less valid. Among the 323 items, there were 222 occupation related activities, and 84 occupational titles. Seventeen items were designed to describe typical physical and non-physical work environments, and general human activities. These 17 items would provide the students with additional knowledge about their interests and needs related to their abilities, and physical and human environment of the workplace. These 17 items may be helpful in

identifying students who have low interests profile and have difficulty in making an occupational choice. The ratio between occupational activities and occupational titles is arbitrary based on the assumption that most people choose their occupation because they like the activities involved in a given occupation, nevertheless, others may put more weight on the occupational titles that closely related to social-economic status. These 323 items were theoretically organized into the following subscales:

1. Artistic and Cultural
2. Scientific Research
3. Mechanical and Technological
4. Business
5. Leadership
6. Education
7. Legal Practice
8. Medical Science
9. Social Science
10. Service
11. Farming

Although the confirmation of these eleven (11) homogeneous subscales has yet to be proved, it is evident that most Chinese college graduates and high school graduates do work in these areas (National Census, 1985). Therefore, items developed based on the job description of the above occupational titles can be assumed necessary and sufficient to establish homogeneous scales to assist students in choosing a specific occupation or occupations. The researcher used principal component analysis to



modify the above clusters to see whether those subscales are independent of each other, and represent unique occupational interest groups.

### 3.2.3. Format

Subjects in this study were asked to select one of five responses to each item. These five responses are: A=Strongly Like; B=Like; C=Indifferent; D=Dislike; and E=Strongly Dislike.

Each response from the subject will be credited a point, that is A=2 points, B=1 point, C=0 point, D=-1 point, and E=-2 points. Written instructions were placed at the beginning of the inventory. Answer sheets were provided. Separate but attached to the CVII was the questionnaire.

The design of the CVII is similar to Strong-Campbell Interests Inventory (SCII) and other inventories. However, there are differences, for example, SCII uses single statement followed by three responses-like, dislike, and indifference, whereas CVII requests students to choose one of the five responses-strongly like, like, indifferent, dislike, and strongly dislike. However, CVII has one major difference from SCII in its format. CVII uses occupational activities and occupational titles, which in theory should increase its ability to differentiate among vocational interests. It was hoped that CVII design would reduce its item overlapping rate through the content structure of the items and the additional revision.

CVII design also differs from Kuder-DD. The latter uses triads response system to force respondents to choose in order to differentiate their own interests. In that design, no matter how carefully the triads are structured, it is almost inevitable that they will

inhibit students from expressing their true interests. The respondents to CVII have greater latitude to exercise their free will to choose one of the five specific responses. It was assumed that the responses would be more accurate.

#### 3.2.4. Translation and Final Refinement

First, 14 Chinese graduate students from the University of Massachusetts at Amherst were invited to take CVII in both English and Chinese version (Appendix B). The revised form of CVII was then shipped to China for the final refinement of standard Chinese language by consultation with two Chinese language professors in Beijing, China. Most of the translation were quite simplistic and straightforward, because job activities and titles are similar in both Western and Oriental world. The results of this consultation were then reviewed and the CVII was revised for administration to secondary school students in Beijing, China.

#### 3.3. Sample

Four hundred and fifty four (454) students from 4 different high schools in Beijing, China (PRC) voluntarily participated in the research. Beijing, as Capital of China, represents the mainstream of the country's culture transformation, and its economic reform. Residential population of Beijing is 10 million and is considered culturally diversified. This is approximately 1 percent of total population of PRC. All high schools in China use standard curriculum which include Chinese, Mathematics, Physics, Chemistry, Biology, Geography, History, English, and Physical Education. The 4 schools are located in Haidian, Chaoyang, and Xunwu districts of Beijing.

Haidian district is well known as the home of famous universities, colleges, other intellectual institutions, and high-tech business corporations, whereas Chaoyang and Xunwu are communities for traditional industrial workers. According to the school administrators, academic performance of the three schools from Haidian and Chaoyang district is slightly above average in the city, whereas the school from Xunwu performed somewhat below the average. However, student academic performance in Beijing has been documented to be above the national average. Four hundred and fifty four student subjects were randomly selected. Four classes were from Haidian district, 2 from Chaoyang, and 2 from Xunwu district. Among them 4 were 11th grade, and 4 were 10th grade. Age of the student participants ranged from 15 to 17, with majority of 16 year old. There were 4-5 percent of subjects who were either 14 or 18 years of age. Gender ratio is close to half and half, with 192 female students and 210 male students out of total of 402 who both completed the inventory and identified their gender on the attached information questionnaire. Table 1 summarized distribution of age and gender of the student sample.

Table 1. Gender and Age Distribution among 402 High School Student Participants in Beijing

GENDER	AGE				Total
	15	16	17	14 or 18	
Male	48	105	47	10	210
Female	56	96	31	9	192
Total	104	201	78	19	402



The student subjects were from a variety of families with widely distributed social-economic status, from janitor, manual labor to doctor, lawyer, business people, and government official, etc.

Data collection went rather smoothly. The students were notified of the date, time and place that the actual administration of the inventory would take place. Extra pens and pencils were provided. The researcher and a class instructor first presented a brief introduction of the purpose of the study, it was stated, "Thank you all for participating in our research project. This research is about your career interests. We'd like you to fill out the information questionnaire before you answer the questions in the inventory. Remember, all the answers you put on the paper will be kept confidential, and please do not write your name". The instructions (see Appendix B) were read aloud to the participants after the inventory was handed to them. The average time to complete the inventory was approximately 35 minutes for the given subjects, excluding the time for completion of information questionnaire attached to the inventory. There was a translation error that was not identified until after the data was collected. The item 294, Conductor, which means a person who sells bus ticket on the public transportation, was mistakenly translated into Chinese as Music Conductor, while the relevant activities were the same. The effect of the error to the entire data analysis will be discussed later in Chapter 5. There were no other significant technical problems during the administration of the CVII.

The subjects were generally interested in the inventory, and showed a cooperative attitude in the classroom. Although name was not required because of confidentiality

and validity of the inventory, some still wrote down their full names on the information questionnaire.

### 3.4. Research Design

The design of the study focused on the instrument (CVII) design, and item development and refinement. There are three main components in this design. The first was to conduct item screening to test for the item discrimination. The second was to investigate its concurrent validity, and to conduct reliability checks for its internal consistency. The last task was to conduct confirmatory factor analyses to identify homogeneous clusters of occupations, and to test for mutual exclusiveness of the 11 original occupational subscales. Gender differences in responding to the inventory were also documented in both the validity study and the factor analyses, the results then may lead to the establishment of the gender separated occupational interests subscales which contain new sets of items different from the original ones.

#### 3.4.1. Item Screening

The items screening was conducted by using the data collected from 454 student subjects in Chinese high schools. The responses to each item from all students were scored. Two criteria were predetermined in examining the discrimination ability of items. The first criterion was whether 90 percent or more subjects responded favorably or unfavorably to an item. The rationale of setting this arbitrary cut-off point was that the inventory is presumably moderately heterogeneous, therefore, any given item would lose its power to differentiate from one occupation to another if majority

of subject population like or dislike the item. Both Strong and Kuder have attempted to minimize the overlapping rate between the items, though they both agreed it is inevitable. For this reason, this researcher constructed a different design in the CVII attempting to maximize the discrimination ability of the items. The effort has been made in the item developing process where the attention was given to the uniqueness and individuality of each item. For instance, "Pull out teeth" is the unique description for the dentist. It would be difficult to imagine that majority of population would like to "pull out teeth". The second criterion related to the number of loadings of a given item on different factors. If an item has moderately high loadings on more than one factor, it may be less valid in discriminating occupational interests of students. This second criterion would apply only if either favorable or unfavorable response to item falls below 10 percent, and the item would be reserved for more study.

#### 3.4.2. Reliability

Cronbach alpha reliability was applied to measure internal consistency of the CVII. The coefficient alpha was chosen because it is equal to the average value of all split-half coefficients resulting from different splittings (Cronbach, 1951, Novick and Lewis, 1967). Alternatively, alpha can be considered a unique estimate of the expected correlation of one test with an alternative form containing the same number of items (Carmines and Zeller, 1979). The alpha coefficients were also collected for each occupational subscale in order to further analyze the consistency of the subtests. The Cronbach alpha coefficient formula is given below,



$$r_{tt} = \left( \frac{n}{n-1} \right) \frac{SD_t^2 - \sum (SD_i^2)}{SD_t^2} \quad (\text{Anastasi, 1988, p.124})$$

where  $r_{tt}$  stands for the Cronbach alpha coefficient,  $SD_t^2$  is the standard deviation of the total scores,  $\sum(SD_i^2)$  is the sum of the variances of item scores, and  $n$  is the total number of items.

### 3.4.3. Concurrent validity

As discussed in Chapter Two, concurrent validity data of the CVII comes from the information questionnaire attached to the inventory (Appendix B). Pearson product moment correlation coefficient and Point biserial correlation coefficient were used to meet this objective. A comparison of the students' expressed choices of occupations, i.e. their most and least favorable jobs, with the scores they obtained in related subscales (inventoried interests) were calculated. To explain further, the subjects' three most liked and three least liked occupation choices were defined as biserial variables. The total of raw scores on any given occupation activity items in the inventory served as the continuous variable. The raw score of the continuous variable was converted to a standard score in order to compare with each other. For example, a student chooses Doctor as one of her three most liked occupations on the information questionnaire, meanwhile her total raw score on Physician's activity items is 10 (might be 1+2+0+2+1+2+2 on 7 items) out of 14 maximum points. Therefore, her standard score is 71 (10/14=71). The same procedure with the least liked occupations was applied to create the other biserial variable. The statistical formula applied for this type of concurrent validity is

$$r_{pbi} = \frac{\bar{X}_p - \bar{X}_q}{S_x} \sqrt{pq} \quad (\text{Ferguson, 1989, P.459})$$

where  $r_{pbi}$  means Point biserial correlation,  $S_x$  is the standard deviation of the total scores on the activity items that related to the most liked or least liked occupations selected by the students.  $\bar{X}_p$  and  $\bar{X}_q$  are the means of the continuous variable (inventory) of the above two categories (like to be a doctor or dislike to be a doctor). The quantities  $p$  and  $q$  are the proportions of individuals in the above dichotomous variable.

Correlation between items of occupational activities and items of the related occupational titles (in the inventory) were also investigated as a supplemental evidence for the internal validity of the inventory. In practice, the researcher selected 84 occupational title items in the CVII as a subset of items to serve the purpose of providing a higher (if not the highest) consistent internal criterion when the desired external criterion was absent (such as job satisfaction data from criterion groups).

Pearson's product moment was used to measure such a validity. The correlation coefficients of the 11 original subscales of CVII were also computed separately to provide more statistical data.

#### 3.4.4. Factor Analysis

Since all the items were developed based on the occupational classification in China, it is reasonable to postulate that these items may fall into certain categories. Principal component analyses were conducted on the male, female, and combined student subjects to extract factors from intercorrelation of the items, and the clusters

of interests or factors were then carefully labelled. The purpose of using this statistical procedure was to further ensure the homogeneity within each defined subscale of the inventory. The results of the factor analyses would provide valuable information regarding whether boys and girls in China differ from each other in their occupational preference. Different factors extracted from the female and male students may be reorganized into gender separated homogeneous subscales of occupational interests.

SPSS ( version 4.0 ) was employed to carry out the principal component analysis to extract factors based on 323 items completed by the 410 secondary student subjects. By default, the principal component analysis program of SPSS automatically assigned unities (ones) to the diagonal of the correlation matrix as initial communality. The method of iteration-by-refactoring (Harman, H., 1967, P. 85-86) was employed in this computerized procedure in which a number of factors was predetermined, then at the end of this solution the calculated communality, which is the sum of squares of the common factor loadings, was inserted as a new set of estimated communality. This procedure is supposed to be repeated until the recomputed diagonal values no longer change from the preceding set. The researcher selected the default method which indicated 25 iterations. For the reason of lack of estimates in the initial communality, which, when used together with eigenvalue (the contributions of the factors to the total variance of the variables), usually serves as a benchmark of determining when to stop factorization, multiple attempts were made to generate final communality data resulting from this solution. Factor extraction was stopped by the researcher when the eigenvalue approximated the total communality of all variables (Harman, H. 1967).



Items which showed either low loadings on factors or moderately positive loadings on more than one factors were identified.

#### 3.4.5. Gender Difference in Occupational Interests

In addition to the principal component analyses on gender specific factors, the percentage of responses to the 323 items in the CVII by 210 male students and 192 female students was documented in order to compare gender differences in the occupation related activities. Choices by boys and girls on the 84 occupational titles in the inventory were compared and Z tests of the proportion of the responses on these items were executed to further examine gender differences in statistical terms.

## CHAPTER 4

### RESEARCH FINDINGS

The purpose of this research project was to study the reliability and concurrent validity of each subscale of the CVII. In addition, a factor analysis of occupational activity items was done for male, female, and combined student participants. Gender differences in responding to the 84 occupational titles were also studied. The CVII was administered to 410 Chinese high school students from three districts in Beijing, PRC. Among them, 192 and 210 were identified as male and female students, respectively. Ten students failed to identify their gender on the information questionnaire. The total number of identified male and female students was 402, though the factor analysis of the combined student sample contained 410 subjects.

#### 4.1. Reliability of CVII

Using Cronbach alpha correlation coefficient, the researcher tested the internal consistency of the 11 subscales of the CVII based on the total of 410 Chinese high school students, and found that the 11 correlation coefficients ranged from .75 to .94 with a median of .90. Only the items including both occupational activities and occupational titles linked with a given subscale contributed to the alpha of the subscale. The subscales containing higher Cronbach alpha coefficients were Artistic & Cultural (42 items,  $\alpha=.94$ ), Mechanical & Technological (38 items,  $\alpha=.94$ ), Scientific Research (34 items,  $\alpha=.92$ ), Legal Practice (22 items,  $\alpha=.92$ ), Business

(32 items,  $\alpha=.91$ ), Medical Science (48 items,  $\alpha=.90$ ), Service (44 items,  $\alpha=.90$ ), and Social Science (24 items,  $\alpha=.89$ ). Alpha correlation coefficient greater than .85 indicates defensible reliability for a test. Further, the smaller variance among the items in a given test or a subtest (as a high  $\alpha$  indicates) suggests its nature of homogeneity. The alpha coefficients for the rest of the subscales were relatively lower. They were Education (12 items,  $\alpha=.84$ ), Leadership (8 items,  $\alpha=.75$ ), and Farmer (12 items,  $\alpha=.75$ ). The generally acceptable reliability in the field of psychological and vocational testing is .85. Therefore, the subscales of Education, Leadership and Farmer are lower than the cutoff point. Whether or not these subscales are reliable depends on multiple factors, such as the number of items in the subscales, and gender variable. More discussion on how these factors may affect the reliability data will be presented in the next chapter.

The Cronbach alpha coefficient for the total items of the inventory was found to be .98, which was substantially high reliability. The Table 2 shows the results of the entire calculation. The interpretation of these data will be elicited in Chapter 5.

#### 4.2. Validity of CVII

Two kinds of validity were investigated for the CVII. First, the correlation coefficients between the stated most-liked or least-liked occupations on the information questionnaire and the items of the activities related to those occupations were calculated. These results were computed according to the students' age and gender. The coefficients for both male and female students tend to go higher with older age. The correlation coefficient for the 15-year-old male was .62, 16-year-old male .64, and



17-year-old .67, whereas the 15-year-female obtained .58, 16-year-old .70, and 17-year-old .74. The correlation coefficient based on the total number of subjects was .65. All these correlation coefficients are considered moderately high in measuring the concurrent validity of a vocational test.

The students stated their occupational preferences by naming three most liked occupations and three least liked ones. These were used as dichotomous variables, whereas subjects' raw scores on the occupational activity items that describe their preference were computed as the continuous variable. For instance, a student chose Manager as one of her three most liked occupations on the information questionnaire, and her total raw score on Manager's activity items was 7 (might be 1+2+0+2+1-1+2 on a total of 7 items) out of 14 maximum points. These raw scores were then converted to a standard score because each occupational category contained a different number of items. Therefore, this student's standard score was 50 ( $7/14 \times 100=50$ ). Then the mean and standard deviation of these individual standard scores were obtained. The same procedure with the least liked occupations was applied to create the other biserial variable in order to calculate the Point biserial correlation coefficients. The results are shown in Table 3.

In Table 3, the data under the column of  $M_1$  are the means of the scores of the occupational activities which are the descriptions of the Most-liked occupations that the students listed on the information questionnaire sheet, whereas  $M_2$  indicates the means that related to the Least-liked occupations responded by the students.  $N_1$  and  $N_2$  represent the numbers of the matches between the Most-liked and the related activity items, and the Least-liked and the related activity items, respectively. SD stands for

the standard deviation of the scores of the grouped activity items. The data under  $r_{pbi}$  are Point biserial correlation coefficients. For instance, on the second row of this table, 142 ( $N_1$ ) matches were made between the Most-liked occupations selected from the questionnaire by 15 year old female students and the activity items that describe these occupations, the mean ( $M_1$ ) of the scores on these particular items is 33.20. And accordingly, 120 ( $N_2$ ) matches reflected the relationship between the Least-liked occupations selected and the relevant items in the inventory by the same group of students, and the mean ( $M_2$ ) of the scores on the items linked to these Least-liked jobs is -28.59. The standard deviation (SD) of the continuous variable, which is the scores on the items that related to the occupation preference (including both the Most-liked and the Least-liked) by this group, was 53.18. Thus, the Point biserial correlation coefficient ( $r_{pbi}$ ) for the 15 year old female subjects is .58. The correlation coefficients from the entire male, female, and the total subjects were found to be .64, .66, and .65, respectively. The correlation coefficient (.74) for the 17 year old female students was found to be significantly higher ( $p < .05$ ) than the one (.58) for the 15 year old female subjects. The differences of the correlation coefficients in other age groups were not statistically significant.

The comparison between the occupational titles of the inventory and the related activities also generated statistically significant results (see Table 4 and Table 5). In the right column of the Table 4 are listed the calculated Pearson's product moment correlation coefficients. This is the relationship between the 83 occupations and the descriptive activities. The Conductor, item 294, was removed from this table because of the translation error described in Chapter 3. These Pearson product moments ranged

from .20 to .67 with a median of .45 among the 83 occupational categories. All these coefficients were obtained cross gender and age, and they were significantly different from zero at .01 level. Some occupational titles, among others, have the highest correlation coefficients, they were Actor/actress ( $r=.62$ ), Dancer ( $r=.67$ ), Mathematician ( $r=.64$ ), Airplane pilot ( $r=.63$ ), Judge ( $r=.60$ ), Police officer ( $r=.59$ ), Physician ( $r=.58$ ), Industrial designer ( $r=.58$ ), Costume designer ( $r=.56$ ), and Computer technician ( $r=.58$ ). Some relatively low moderate correlation coefficients include Purchasing agent ( $r=.20$ ), Interior designer ( $r=.21$ ), Chemical engineer ( $r=.27$ ), Secondary school teacher ( $r=.25$ ), Carpenter ( $r=.27$ ), and College teacher ( $r=.32$ ). Interpretation of these data will be presented in the next chapter.

Table 5 is the extension of Table 4, which shows the correlation coefficients between the items of the occupational titles and the items of the occupational activities of the original 11 subscales of the CVII by all 410 student subjects. The data on the right column are the Pearson's product moments which ranged from .41 to .80 with a median of .71. Medical Science scale has the highest coefficient ( $r=.80$ ) between the titles and activity items, following that are Scientific Research ( $r=.78$ ), Artistic & Cultural ( $r=.77$ ), Legal Practice ( $r=.73$ ), Social Science ( $r=.71$ ), Mechanical & Technological ( $r=.71$ ), Service ( $r=.68$ ), Business ( $r=.66$ ), Education ( $r=.59$ ), Farmer ( $r=.43$ ), and Leadership ( $r=.41$ ). The correlation coefficient of the entire occupational activity items against the occupational titles of the CVII was found to be .81, which is considered high validity data in a vocational testing instrument.



#### 4.3. Factor Analysis of CVII

The factor analyses were conducted based on the assumption that some occupational items are more correlated than others. Therefore, homogeneous scales can be formed by using the higher factor loading items resulted from the factor analyses to assist the students to identify their basic occupational interests, and to plan for their career. Further more, gender specific occupational interests scales, which are also homogeneous, may result from the factor analyses by using sex separated samples.

The factorization of the 323 items of the CVII was completed with total sample of 410 student subjects participating. The researcher chose the Principal-component factor solution. This solution extracted 10 factors originally. The eigenvalues of this factor analysis of CVII were 44.10, 22.40, 13.15, 9.08, 6.76, 5.55, 5.28, 4.83, 4.46, and 4.28. Appendix C contains the computer program of the principal-component analysis and initial statistics including initial communality and eigenvalues. For economy of space, only the first 25 items are shown in Appendix C. Factorization was discontinued when accumulation of the first 10 eigenvalues (119.94) approximated the total of calculated communality (121.03) as a result of 25 iterations (by default). The unrotated factor coefficient and calculated communality (on the right column) of the 323 items in the CVII are shown in Appendix D. The contributions ( $V_p$ ) of the 10 factors to the total variance were listed on the bottom line of the Appendix D. Assuming some correlation between the factors, the researcher selected oblique method of rotation for interpretation of the extracted factors. Factor loadings greater than .25 were sorted and listed on Table 6. Item numbers and content under the rotated factors are reported in Table 6. In the right column is the sorted factor loadings, next to it is communality of

each variable, which indicated the proportion of the variance which is common to other variables in the CVII. Items that directly follow the factor name are the ones that have higher loadings. Items that have approximate loadings lower than .25 were listed on Table 7, which will be analyzed in the next chapter. Nine factors were labelled according to the content of the factor loadings (items). One factor was vague with relatively low factor loadings, some items obviously overlapped. Therefore, this factor along with its factor loadings was listed as undecided on Table 6. The ten factors were: 1. Medical; 2. Business; 3. Science and Technology; 4. Artistic Creativity; 5. Scholastic; 6. Analytical; 7. Service; 8. Undecided; 9. Legal Practice; and 10. Artistic.

The Medical, Business, Legal Practice, and Artistic factors were labelled after the names of the same original subscales of the CVII because they contain the most of the items that were designed for those original subscales. The original subscales of Scientific Research and Mechanical & Technological were integrated into one factor which was named as Science and Technology. On the other hand, the items in the Artistic & Culture subscale was factorized into two separate components, which were labelled as Artistic Creativity and Artistic. Most of the leadership items showed higher loadings under the Business factor. Some language skill related occupational activity items initially categorized under the Scientific Research subscale correlated moderately high with the items in the Education subscale. Therefore, the factor which contained those items was named Scholastic, reflecting the nature of this group of items.

Analytical factor is independent of any of 11 subscales. The items included in this factor were more analytical and academic oriented, though the factor loadings were just moderately high. Finally, the factor loadings in the Service factor were similar to

the items under the Service subscale. The importance of these findings and issue of forming the homogeneous subscales based on the factors, as opposed to the 11 original subscales, will be explained further in Chapter 5.

The substantially low intercorrelations among these ten factors were presented as factor correlation matrix shown in Table 8, in which F stands for Factor, thus, F1 indicates Medical factor, and so forth. These correlation coefficients ranged from -.05 to .33 with a median of .12. Most of the coefficients fall between 0 and .15, indicating there is no correlation among the most factors. The factor that had some low correlations with other factors is the Medical factor which correlated with Scientific & Technological ( $r=.24$ ), Scholastic ( $r=.33$ ), and Service ( $r=.24$ ). The table also describes the rotation method and procedure of the principal component factor analysis. The calculations of the completed unsorted rotated factor loadings of 323 items of the CVII were prepared with boldface on the loadings greater than .25. This is shown in Appendix E.

Principal component analyses on the male and the female students were executed separately with the same technical procedure described previously. Nine (9) factors were identified and labelled for the female students sample, and seven (7) factors were generated for the male student subjects. The eigenvalues of the factor solution for the female students were 36.88, 21.49, 12.85, 9.52, 8.31, 7.24, 6.55, 6.12, and 5.71. The related factors for the female were Scientific & technical, Business, Service, Medical, Scholastic, Artistic, Performing art, Legal, and Journalism. The eigenvalues for the male factor solution were 55.08, 19.57, 12.54, 9.03, 7.29, 6.69, and 5.67. These factors were labelled as Service, Business, Scientific & technical, Artistic, Mechanical,



Clerical, and Legal. Factor loadings higher than .25 were sorted and listed on Table 9 and 10 for the male students and the female students, respectively. The comparison of these factor results among the male, female and combined student sample is shown in Table 11. Further discussion of the factor analyses and interpretation will be presented in the following chapter.

#### 4.4. Age Differences on CVII

Age difference in the factor analyses on the CVII was left uninvestigated because of relatively small samples (see Table 1, Gender and Age Distribution among 402 High School Student Participants in Beijing) of the different age groups of this project. In the correlation study, the data from the correlation coefficients between the most-liked or the least-liked occupations in the information questionnaire and the items of activities in the CVII did not reveal any significant age difference (from 15 to 17) in the male students. Table 5 shows that the 15 year old male students obtained the concurrent validity correlation coefficient (between their selected occupations and the related occupational activities) of .62, 16 year old male students had .64, and 17 year old reached .67 which is the highest. On the other hand, the 15, 16, and 17 year old girls obtained the correlation coefficients of .58, .70, and .74, respectively. The correlation coefficient (.74) for the 17 year old female students was found to be significantly higher ( $p < .05$ ) than the one (.58) for the 15 year old female subjects. Although the relations among the rest of the data are not statistically significant, the data show their tendency of going higher with older age across gender. Based on the data, it may be suggested that the girls for their age may be more mature in

preparation for their career than the boys. This comes from comparing the data for the 16 and 17 year old male students with the 16 and 17 year old female students, and the latter is higher.

#### 4.5. Gender Difference on CVII

In order to establish discrimination power of all items in the inventory, the percentage of favorable responses (number of subjects who liked or strongly liked) and negative responses (number of subjects who disliked or strongly disliked) to the items were compared. Differences between male and female responses to the items are presented in Table 12. These responses were used to examine the discrimination power of the items. These responses were also used to analyze gender differences in responding to the items of the CVII. To illustrate this feature in more depth, the researcher used the response percentage data and computed the mean and standard deviation of the 11 subscales of both male and female students. The mean score on the Artistic & Cultural scale by the female was 53.71, compared with 38.49 by the male students. The mean scores by the male students on the Scientific Research scale and Mechanical & Technology scale were 37.62 and 35.72 compared with the means of 24.09 and 20.98 by their counterpart. These differences were statistically significant on the above scales in which the female students scored higher on the Artistic & Cultural scale than the male students, whereas the male students averaged higher scores on the Scientific Research scale and the Mechanical & Technology scale than the female students. The differences of the mean scores between the male and female students were not significant on the scale of Business (male=40.83, female=42.45), Official

(male=36.63, female=36), Education (male=25, female=31.20), Legal Practice (male=43.82, female=48.68), Medical Science (male=27.58, female=22.98), Social Science (male=35.33, female=37.42), Service (male=27.77, female=28.72), and Farmer (male=32.83, female=31.33). This is shown in Table 13. Both the occupational titles and the activities were included in these analyses.

Differences in percentages of the preferred occupational titles between the male and the female students are reported in Table 14. Computed Z values were listed to determine the statistical significance of the percentage difference. It appears that the girls prefer the artistic and language skill related occupations while the boys in Beijing like jobs in the science, technology, engineering, and mechanical fields. The most popular occupations for the girls were Costume Designer, Commercial Artist, Dancer, Flight Attendant, Radio & TV Announcer, Secretary, Interior Designer, Public Relation Worker, Psychologist, Musician, Singer, and Newspaper Reporter. On the other hand, the most popular jobs for the male students were Chemist, Physicist, Electrical Engineer, Computer Technician, Soil Scientist, Mathematician, Computer Programmer, Biochemist, Machinery Repairer, Chemical Engineer, and Electrician. These results will be discussed in more detail in Chapter 5.

#### 4.6. Summary of Findings

In summary, reliability which measures internal consistency was found substantially high ( $r=.98$ ). The high alpha coefficients for the 11 subscales also indicated the acceptable range of reliability (from .75 to .94). The concurrent validity between the most-liked or least-liked occupations and the related activity items was



found to be .65, whereas the correlation between the occupational title and activity was found to be .81. The correlations of the subscales were also high (from .41 to .80).

The factor analyses supported the assumption of homogeneity of the occupational interests. Items in the CVII were recategorized based on the factor loadings under each of the 9 factors generated by using the combined student subjects. The original 11 subscales in the CVII developed based on the Chinese official occupation categorization has shown some moderate correlations among the subscales (see Appendix G), whereas the new subscales generated throughout the factor analysis using the items in those 11 subscales showed no correlations among most factors (except Medical factor which has low correlations with Science, Scholastic, Analytical, and Service). The 11 subscales of the CVII actually have served the purpose of providing a guideline for developing the activity items of the CVII and made this new nine-subscale basic interests inventory possible. The issue of gender-separated basic interest scales will be discussed in the following chapter.

Age difference was noticed in female between age of 15 and 17 with the latter obtained higher correlation coefficient of the concurrent validity. Gender differences were reflected primarily throughout the factor analyses. Some significant occupational preferences were observed between the boys and girls in the 83 occupations in the CVII. There was higher percentage of female students who preferred Art, and some language skill related occupations, whereas male students dominated the area of Science and Technology, and Mechanical.

Table 2. Reliability Coefficients of Chinese Vocational Interest Inventory ( $N=410$ )

Subscales	Number of items contribute to $\alpha$	Cronbach $\alpha$
Artistic & Cultural	42	.94
Scientific Research	34	.92
Mechanical & Technological	38	.94
Business	32	.91
Leadership	8	.75
Education	12	.84
Legal Practice	22	.92
Medical Science	48	.90
Social Science	24	.89
Service	44	.90
Farmer	12	.75
Reliability of CVII	323	.98

Table 3. Point Biserial Correlation between the Most-liked or the Least-liked Occupations in the Information Questionnaire and the Items of Activities in the CVII ( $N=410$ )

Sex	Age	$M_1$	$M_2$	$N_1$	$N_2$	SD	$r_{pbi}$
Male	15	35.97	-35.25	95	67	57.04	.62
Female	15	33.20	-28.59	142	120	53.18	.58
Male	16	37.95	-28.59	250	196	51.84	.64
Female	16	40.22	-34.51	255	192	52.87	.70
Male	17	39.44	-29.07	84	68	50.70	.67
Female	17	39.62	-39.04	55	48	53.03	.74
Male total		37.80	-30.04	429	331	52.72	.64
Female total		37.94	-33.14	452	360	52.96	.66
Total		37.87	-31.65	881	691	52.84	.65

$M_1$ =Mean of the scores on occupational activity related to the most-liked jobs.

$M_2$ =Mean of the scores on occupational activity related to the least-liked jobs.

$N_1$ =Number of matches between the most-liked occupation and related activity items.

$N_2$ =Number of matches between the least-liked occupation and related activity items.

SD= Standard deviation of the scores of the grouped activity items.

$r_{pbi}$ = Point biserial correlation coefficient.

Table 4. Correlation Coefficient between Items of Occupational Titles and Items of the Occupational Activities Using Pearson Product Moment (N=410)

Occupational titles	Correlation
Newspaper reporter	.5259
Interpreter	.3459
Singer	.5737
Commercial artist	.5452
Interior designer	.2067
Costume designer	.5657
Radio and television announcer	.5317
Industrial designer	.5844
Actor/actress	.6279
Photographer	.5625
Musician	.5967
Dancer	.6783
Meteorologist	.4203
Architect	.2947
Food scientist	.4287
Soil scientist	.5156
Physicist	.5466
Geologist	.4570
Chemist	.4541
Biochemist	.5040
Mathematician	.6402
Librarian	.3022
Geographer	.4721
Machinery repairer	.3365
Appliance repairer	.3534
Computer technician	.5795
Mechanical engineer	.5149
Agricultural engineer	.3608
Chemical engineer	.2794
Civil engineer	.3771
Automobile mechanic	.4903
Electrician	.3064
Electrical engineer	.4741
Computer programmer	.5233
Manager	.4605
Hotel manager	.5436
Accountant	.3718
Purchasing agent	.2038
Public relations worker	.3813

Continued, next page



Table 4 continued

Bank clerk	.3064
Government official	.4104
Elementary school teacher	.4544
Secondary school teacher	.2496
College teacher	.3191
Judge	.6080
Police officer	.5969
Corporation lawyer	.4541
Criminal lawyer	.5358
Lawyer	.5192
Pharmacist	.5545
Radiologist	.3437
Medical lab worker	.3782
Veterinarian	.5607
Dietitian	.5072
Physical therapist	.3657
Nurse	.4870
Optometrist	.3950
Dentist	.3778
Physician	.5859
Surgeon	.4378
Economist	.5648
Political scientist	.4685
Historian	.5060
Psychologist	.5573
Sociologist	.4491
Postman	.3575
Shoe repairer	.3141
Flight attendant	.4149
Carpenter	.2682
Sales worker	.4101
Chef	.3156
Waiter/waitress	.5433
Barber/hair dresser	.5154
Airplane pilot	.6271
Taxicab driver	.5112
Bus driver	.5039
Secretary	.3914
Telephone operator	.2983
Craft person	.3362
Self employed	.3109
Farmer	.3459
Farm equipment mechanic	.4157

Table 5. Pearson Product Moment Correlation Coefficient between Items of Occupational Titles and Items of the Occupational Activities of the Original 11 Subscales of the CVII (N=410)

Subscales	Correlation between activities and titles
Artistic and Cultural	.7722
Scientific Research	.7778
Mechanical and Technological	.7053
Business	.6646
Leadership	.4104
Education	.5953
Legal Practice	.7303
Medical Science	.8020
Social Science	.7078
Service	.6842
Farmer	.4297
Correlation between all activity items and title items of the CVII= .8135	

Table 6. The Result of Principal Component Analysis of Male and Female Combined  
(N=410)

Factor 1 Artistic

Item number	Content of Item	$h^2$	$r$
180	Play a role in a motion picture film	.4478	.4328
291	Musician	.5477	.7480
134	Play in a symphony orchestra	.5212	.7433
193	Sing in a concert hall	.5522	.7405
228	Singer	.4658	.6870
184	Perform with musical instruments	.4729	.6816
183	Dance on stage	.5252	.6708
292	Dancer	.4977	.6699
188	Play in a dance band	.4767	.6587
122	Sing in choral groups	.3864	.6317
294	Conductor	.4621	.5892
32	Write songs	.4278	.5811
236	Actor/actress	.4543	.5628
195	Sing in a bar	.4051	.5184
234	Radio and television announcer	.4444	.4550
126	Interview people for newspaper article	.4180	.4279
4	Direct a play	.2911	.4094
170	Broadcast news over radio or television	.4387	.3866
50	Make musical instruments	.3907	.3850
223	Newspaper reporter	.3762	.3850
189	Memorize stage lines	.3317	.3737
261	Flight attendant	.3828	.3730
278	Photographer	.3600	.3119
194	Provide news information for media	.3341	.3039
209	Gather information on current events	.3853	.2974
297	Secretary	.3929	.2958
312	Do outdoor work	.1987	.2931
38	Repair musical instruments	.2989	.2924
51	Participate photographic competition	.2852	.2911
208	Write story for newspaper	.3543	.2714
231	Costume designer	.5364	.2811
235	Interior designer	.4729	.2599
229	Commercial artist	.5568	.3875
33	Decorate an exhibition	.4526	.2904
29	Carve artistic objects	.3728	.3193
13	Develop ideas for TV commercials	.3983	.2629
1	Design an oil painting	.3317	.3320

Continued, next page



Table 6 continued

197	Make television commercials	.4605	.2588
317	Do things with color	.3234	.3099

## Factor 2 Science and Technology

248	Physicist	.4898	.6363
254	Mathematician	.5093	.6339
87	Develop new mathematical principles	.5097	.6256
252	Chemist	.5117	.6153
35	Design computer operating system	.4645	.6145
72	Develop scientific equipment	.5188	.6062
89	Investigate the composition of matter	.5097	.6010
98	Undertake chemical experiment	.4310	.5864
23	Explain experiment data	.3893	.5690
157	Apply mathematical theories to solve problems	.4542	.5689
125	Create new chemical products	.4276	.5681
178	Repair computers	.4524	.5619
151	Exam the chemical and physical properties of specimens	.4791	.5491
8	Solve a difficult mathematic problem	.3425	.5482
6	Design a computer program	.3704	.5432
39	Create a model of a new machine	.4236	.5363
253	Biochemist	.5032	.5209
246	Computer technician	.3756	.5013
272	Mechanical engineer	.4887	.4737
97	Study the structure of the universe and interaction of matter and energy	.4271	.4631
116	Study the chemistry of living things	.4615	.4535
322	Work with mind	.2615	.4517
96	Design automobiles	.4909	.4508
45	Explain how to use computer	.3186	.4490
145	Use microscope	.3010	.4372
303	Computer programmer	.3164	.4370
275	Chemical engineer	.4470	.4368
295	Electrical engineer	.4611	.4306
282	Airplane pilot	.3919	.4265
28	Operate lab equipments	.2249	.4257
66	Fly an airplane	.3952	.4058
115	Evaluate information from photographs taken from aircraft or satellites	.3715	.4033
128	Develop new products	.3061	.3965

Continued, next page

Table 6 continued

83	Design a television set	.3994	.3879
321	Do creative work	.3140	.3838
192	Design a dam project	.4104	.3829
138	See slight difference in lab samples	.3973	.3662
316	Use numbers at work	.3283	.3357
251	Geologist	.4027	.2949
196	Make detail drawings of buildings	.3330	.2794
61	Operate telephone switchboard	.2398	.2625

## Factor 3 Business

109	Help government make economical policy	.5386	.6994
81	Direct a business	.4503	.6599
91	Propose management strategy for your company	.4792	.6514
49	Develop a financial plan	.4979	.6455
220	Prepare a business agreement	.4449	.6361
84	Understand financial market	.4490	.6357
85	Communicate with business circle	.4768	.5969
279	Economist	.4627	.5642
47	Write business report	.4138	.5474
164	Analyze the relationship between supply of goods and demand	.3848	.5464
210	Advise government officials on international relations	.4358	.5367
207	Conduct legal business transaction	.4640	.5299
43	Organize a social party	.4369	.5042
10	Trade stocks and bonds	.3662	.5040
53	Manage a hotel	.4076	.5033
148	Establish a business	.4747	.4976
80	Make policy for an organization	.3045	.4952
165	Explain the reason for inflation	.3861	.4859
174	Study the functioning of governments	.4445	.4797
147	Instruct passengers	.3290	.4781
144	Participate in developing laws	.4886	.4780
249	Manager	.4231	.4726
111	Decide employees' salary and benefits	.3376	.4692
20	Negotiate price of an item or service	.2971	.4653
264	Hotel manager	.3811	.4547
179	Study social organizations	.4268	.4541
14	Supervise employees	.2628	.4529
2	Write an article about economy	.3587	.4418
127	Enforce policy in an organization	.3676	.4400
320	Work as a leader	.3497	.4353

Continued, next page

Table 6 continued

273	Corporation lawyer	.4044	.4285
64	Convince people to buy your product	.3253	.4232
250	Government official	.3197	.3853
300	Public relations worker	.3116	.3832
105	Design insurance and pension plan	.3288	.3795
162	Research legal document	.4231	.3773
63	Make information available to public	.2694	.3728
307	Work with people	.3292	.3575
16	Develop a budget plan	.2050	.3537
143	Study community life	.3759	.3532
55	Help your organization maintain good working relationship with business community and public	.3296	.3457
314	Do competitive work	.3028	.3365
44	File documents	.3309	.3274
286	Political scientist	.4165	.3098
7	Interview a business manager	.2682	.3074
186	Do book-keeping	.3483	.3063
57	Speak in front of group of people	.2767	.3034
67	Handling check transactions	.2718	.2890
54	Advise people about their rights and responsibilities	.3609	.2690
215	Inspect quality of product	.3347	.2645

## Factor 4 Artistic Creativity

69	Design furniture	.4525	.6521
202	Decorate interior of buildings	.5362	.5384
200	Design new costumes	.5068	.5310
231	Costume designer	.5364	.4984
235	Interior designer	.4729	.4815
229	Commercial artist	.5568	.4743
33	Decorate an exhibition	.4526	.4712
71	Plan construction of buildings	.3326	.4506
230	Industrial designer	.3501	.4388
22	Make cartoon pictures	.2416	.4265
201	Make appearance of products more attractive	.4327	.4182
29	Carve artistic objects	.3728	.4155
139	Create new food dishes	.3113	.4140
163	Make craft with hands	.2659	.4126
13	Develop ideas for TV commercials	.3983	.3982
1	Design an oil painting	.3317	.3832
197	Make television commercials	.4605	.3736
41	Take care of trees	.3165	.3688

Continued, next page



Table 6 continued

120	Design refrigerators	.3532	.3574
99	Collect cuisine	.2703	.3568
280	Craft person	.3871	.3559
222	Decorate shopping window for department store	.4081	.3411
15	Design blue print for a bridge	.3298	.3398
317	Do things with color	.3234	.3360
232	Farmer	.2594	.3055
108	Collect samples of butterfly	.3032	.2881
218	Suggest customers their appropriate hair style	.3207	.2876
24	Attend sports photography show	.2488	.2646
31	Write stories	.2394	.2570
48	Design a poster for a product	.3102	.2583

## Factor 5 Scholastic

269	Secondary school teacher	.3956	.5530
265	Elementary school teacher	.3772	.5093
152	Prepare lectures for a course	.3889	.4611
62	Teach a classroom of students	.3230	.4564
90	Correct assignments for the class	.2357	.4003
212	Help people solve their personal problems as well as social problems	.4293	.3839
315	Do repetitive tasks	.2795	.3711
214	Help students with their learning strategy	.3428	.3707
271	College teacher	.3076	.3644
281	Librarian	.3384	.3624
304	Bank clerk	.2900	.3535
219	Handle letters, documents, and reports	.4002	.3524
302	Accountant	.2744	.3505
206	Translate English book to Chinese	.3272	.3302
318	Use language skill at work	.2804	.3184
73	Receive and send messages	.2908	.3183
172	Write about the past events	.3091	.3083
177	Study family relationships	.3449	.3067
137	Write case notes	.3608	.3052
290	Sociologist	.4129	.3041
224	Interpreter	.2703	.2999
169	Give advice on good eating habits	.3289	.2949
288	Historian	.3480	.2932
205	Study people's language	.3217	.2904
171	Teach geography in school	.3712	.2800
213	Help cripple children practice walk	.2916	.2736

Continued, next page

Table 6 continued

167	Forecast the weather	.3571	.2721
217	Explain job requirements to the new employed	.3585	.2556
Factor 6 Legal			
144	Participate in developing laws	.4886	.3443
273	Corporation lawyer	.4044	.2988
162	Research legal document	.4231	.3096
282	Airplane pilot	.3919	.3420
66	Fly an airplane	.3952	.3507
176	Analyze human behavior	.3493	.2961
181	Investigate criminal case	.4098	.5949
266	Police officer	.3982	.5483
78	Defend criminal case	.4850	.5289
113	Negotiate the settlement of legal problems	.5031	.5241
233	Judge	.4842	.5019
60	Capture criminals	.3499	.5006
277	Criminal lawyer	.4087	.4919
301	Lawyer	.4429	.4758
30	Make legal decision in court trials	.3362	.4726
94	Prepare legal documents	.4656	.3944
185	Train state troopers	.3490	.3606
121	Explain abnormal behavior of individuals and groups	.2946	.3533
104	Understand human mind	.3458	.3266
289	Psychologist	.4509	.3206
204	Use camera to portray people, places and events	.3527	.2862
Factor 7 Medical			
260	Physician	.5257	.7507
258	Optometrist	.5978	.7533
284	Surgeon	.5145	.7239
259	Dentist	.5215	.6643
161	Give medicine by prescription	.4243	.6116
187	Examine patient to diagnose illness	.4184	.6082
225	Pharmacist	.4416	.6061
130	Perform surgical operation on human beings	.3753	.5799
190	Give vaccinations to patients	.4330	.5739
257	Nurse	.4698	.5721
242	Dietitian	.4363	.5659
191	Treat sick animals	.4062	.5640
256	Physical therapist	.5294	.5627

Continued, next page

Table 6 continued

241	Veterinarian	.3580	.5121
140	Analyze the blood, tissues and fluid in the human body	.4349	.5066
11	Study acupuncture	.3243	.5018
239	Medical laboratory worker	.4193	.4971
156	Take care of patients in hospital	.4082	.4895
238	Radiology technologist	.4068	.4805
173	Write case notes	.3785	.4769
203	Advise people about medicine	.3686	.4550
92	Prescribe medicine	.2881	.4465
243	Appliance repairer	.5677	.4434
244	Food Scientist	.3117	.4312
133	Diagnose animal's disease	.3699	.4272
76	Understand how human body functions	.3428	.4236
79	Perform surgery on sick or injured animals	.3758	.4168
118	Make artificial dentures	.3501	.4014
131	Investigate the nutrition of food	.3564	.3965
123	Pull out bad teeth	.3698	.3894
274	Agricultural engineer	.5498	.3677
124	Examine eyes	.2452	.3660
146	Write a lab report	.3369	.3590
287	Geographer	.4264	.3260
226	Meteorologist	.3565	.3206
247	Soil scientist	.4280	.3160
158	Rehabilitate the physically disabled	.3362	.2769
166	Analyze weather information	.4062	.2760
182	Study geography of different countries in the world	.2315	.2554

## Factor 8 Analytical

117	Explain the present based on the knowledge of the past	.4134	.4895
42	Study the political system	.3918	.4542
36	Analyze relationship of groups	.2778	.4332
34	Testing soil for fertilization	.3537	.4006
95	Describe the fundamental forces and laws of nature	.3773	.3980
18	Study Confucianism	.2978	.3839
88	Study the soil	.4710	.3734
70	Analyze products	.3621	.3601
86	Locate natural resources	.3449	.3263
155	Analyze the distribution of land, water, climate and vegetation	.4045	.3188
37	Study the structure of the family	.2305	.2990
27	Conduct quality control studies	.2321	.2900

Continued, next page



Table 6 continued

19	Write a lab report	.3135	.2873
276	Civil engineer	.4087	.2850
3	Organize books in categories	.2218	.2831
153	Prevent forestry and soil from disease	.2980	.2645
26	Prepare receipts for customers	.2365	.2520

## Factor 9 Service

293	Taxicab driver	.4579	.5757
93	Drive trucks	.4129	.5597
283	Automobile mechanic	.5271	.5550
74	Fix problems of cars	.4796	.5538
82	Drive a taxicab	.4414	.5446
296	Bus driver	.4430	.5410
100	Fix household appliance	.4944	.5093
112	Find the cause why cars break down	.4462	.5071
168	Drive buses	.3955	.5014
103	Travel to a farm to make emergency repair	.4720	.4838
262	Carpenter	.5493	.4795
110	Inspect electronic devices	.4457	.4654
305	Farmer	.3665	.4577
141	Solve problems in electronic equipment	.5313	.4531
106	Repair malfunctioning tractors	.4584	.4521
255	Shoe repairer	.4939	.4466
9	Repair radio and television sets	.4202	.4403
285	Electrician	.4322	.4359
245	Farm equipment mechanic	.4766	.4326
142	Build furniture	.4060	.4290
237	Postman	.4686	.4282
114	Inspect machines	.5234	.4250
298	Telephone operator	.4186	.4234
299	Purchasing agent	.3219	.4160
107	Replace worn soles and heels	.3541	.4102
268	Waiter/waitress	.4159	.4102
68	Sell bus tickets	.2719	.4035
240	Machinery repairer	.4415	.3786
58	Serve food and beverages in restaurants	.3378	.3784
211	Guide the customer in restaurant	.4161	.3779
270	Barber/hair dresser	.4168	.3706
136	Sort mail	.3451	.3534
306	Self employed	.2735	.3372

Continued, next page

Table 6 continued

263	Sales worker	.3720	.3247
102	Take clock apart to see what is wrong	.2775	.3227
198	Operate sewing machine	.3240	.3145
17	Make hair for customers in a beauty salon	.2575	.2948
199	Grow crops	.3027	.2601
267	Chef	.2124	.2511
Factor 10 Undecided			
4	Pick up fruit or vegetable	.3078	.3576
5	Feed animals	.2202	.3463
159	Plan nutritious and appetizing foods	.3628	.3460
176	Analyze human behavior	.3493	.3161
135	Type a letter	.2558	.3087
150	Follow-up medical doctor's instruction	.1976	.2986
119	Mediate estrangement between friends	.2938	.2844
40	Listen to weather report	.1612	.2775
101	Advise people about nutrition of food	.3313	.2751
160	Response to problems raised by customer	.3372	.2557
227	Architect	.2603	.2561
78	Defend criminal case	.4850	.2987
113	Negotiate the settlement of legal problems	.5031	.3052
277	Criminal lawyer	.4087	.2536
301	Lawyer	.4429	.2527
94	Prepare legal documents	.4656	.3797
194	Provide news information for media	.3341	.2720

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Table 7. Items of Lower Than .25 Factor Loadings That Have No Contributions to the 10 Extracted Factors (N=410)

Item number	Content of Items
12.	Communicate with customers
21.	Do shorthand
25.	Manage a farm
52.	Satisfy guests
56.	Buy material for the company or/office
59.	Cut hair
75.	Prepare examination to the students
77.	Edit for writing errors
129.	Prescribe lenses for eye glasses
149.	Take X-ray picture
154.	Arrange files alphabetically
175.	Demonstrate to new stewardess how to serve customers
216.	Write on commercial envelopes
308.	Work with things
309.	Work with many people
310.	Work with a few people
311.	Work by yourself
313.	Do indoor work
319.	Do detailed tasks
323.	Work with hand



Table 8. Factor Correlation Matrix (N=410)

OBLIMIN ROTATION 3 FOR EXTRACTION 1 IN ANALYSIS 1 - KAISER  
NORMALIZATION.

OBLIMIN CONVERGED IN 23 ITERATIONS.

FACTOR CORRELATION MATRIX:

	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10
F1	1.000									
F2	.0665	1.000								
F3	.2455	.0715	1.000							
F4	.1120	.1213	.0990	1.000						
F5	.3328	-.0042	.1445	.0461	1.000					
F6	.2144	.0778	.1475	.0768	.1137	1.000				
F7	.2498	.2134	.0703	.1032	.1237	.1272	1.000			
F8	.0305	.0657	-.0513	.1193	.0355	.0160	.0810	1.000		
F9	.1226	.2232	.0881	.1505	-.0402	.0692	.1045	.0622	1.000	
F10	.2010	.1811	-.0541	.2962	.0764	.0852	.2332	.1467	.2106	1.000

F1=Medical F2=Business F3=Scientific & technical F4=Artistic creativity

F5=Scholastic F6=Analytical F7=Service F8=Legal F9=Artistic F10=Undecided

Table 9. Rotated Factor Loadings on 323 Items of CVII by 210 Chinese Male Students of Secondary School

Factor 1. Business

Item Number	Content of Items	Factor Loadings
49.	Develop a financial plan	.7126
47.	Write business report	.6951
109.	Help government make economical policy	.6916
91.	Propose management strategy for your company	.6898
220.	Prepare a business agreement	.6800
84.	Understand financial market	.6527
164.	Analyze the relationship between supply of goods and demand	.6522
81.	Direct a business	.6397
279.	Economist	.6087
85.	Communicate with business circle	.6076
10.	Trade stocks and bonds	.5904
165.	Explain the reason for inflation	.5873
20.	Negotiate price of an item or service	.5774
174.	Study the functioning of governments	.5628
64.	Convince people to buy your product	.5537
264.	Hotel manager	.5470
143.	Study community life	.5468
14.	Supervise employees	.5467
179.	Study social organizations	.5448
207.	Conduct legal business transaction	.5417
53.	Manage a hotel	.5416
43.	Organize a social party	.5404
2.	Write an article about economy	.5402
147.	Instruct passengers	.5261
249.	Manager	.54961
210.	Advise government officials on international relations	.4941
144.	Participate in developing laws	.4901
148.	Establish a business	.4832
177.	Study family relationships	.4771
80.	Make policy for an organization	.4691
42.	Study the political system	.4564
127.	Enforce policy in an organization	.4544
104.	Understand human mind	.4493
63.	Make information available to public	.4424
250.	Government official	.4388

Continued, next page

Table 9 continued

119.	Mediate estrangement between friends	.4213
300.	Public relations worker	.4167
78.	Defend criminal case	.4140
37.	Study the structure of the family	.4052
286.	Political scientist	.4002
320.	Work as a leader	.3972
36.	Analyze relationship of groups	.3959
162.	Research legal document	.3933
111.	Decide employees' salary and benefits	.3883
290.	Sociologist	.3882
289.	Psychologist	.3859
57.	Speak in front of group of people	.3831
77.	Edit for writing errors	.3792
126.	Interview people for newspaper article	.3733
16.	Develop a budget plan	.3697
7.	Interview a business manager	.3669

Factor 2. Scientific and Technical

254.	Mathematician	.6948
35.	Design computer operating system	.6742
252.	Chemist	.6683
248.	Physicist	.6388
87.	Develop new mathematical principles	.6205
98.	Undertake chemical experiment	.6030
253.	Biochemist	.5719
89.	Investigate the composition of matter	.5621
151.	Exam the chemical and physical properties of specimens	.5552
157.	Apply mathematical theories to solve problems	.5481
125.	Create new chemical products	.5383
23.	Explain experiment data	.5346
246.	Computer technician	.5339
6.	Design a computer program	.5207
8.	Solve a difficult mathematic problem	.5197
178.	Repair computers	.4977
72.	Develop scientific equipment	.4963
116.	Study the chemistry of living things	.4733
275.	Chemical engineer	.4713
145.	Use microscope	.4590
28.	Operate lab equipments	.4455
272.	Mechanical engineer	.4441

Continued, next page



Table 9 continued

322.	Work with mind	.4422
321.	Do creative work	.4343
303.	Computer programmer	.4329
97.	Study the structure of the universe and interaction of matter and energy	.4284
45.	Explain how to use computer	.4210
316.	Use numbers at work	.3871
295.	Electrical engineer	.3846
140.	Analyze the blood, tissues and fluid in the human body	.3813
39.	Create a model of a new machine	.3512
115.	Evaluate information from photographs taken from aircraft or satellites	.3403
138.	See slight difference in lab samples	.3352
196.	Make detail drawings of buildings	.3250
282.	Airplane pilot	.3153
149.	Take X-ray picture	.3141
187.	Examine patient to diagnose illness	.3125

## Factor 3. Artistic

229.	Commercial artist	.6589
231.	Costume designer	.6162
33.	Decorate an exhibition	.6150
200.	Design new costumes	.5992
235.	Interior designer	.5845
202.	Decorate interior of buildings	.5697
29.	Carve artistic objects	.5372
291.	Musician	.5326
193.	Sing in a concert hall	.5096
228.	Singer	.5096
108.	Collect samples of butterfly	.4989
139.	Create new food dishes	.4913
1.	Design an oil painting	.4799
184.	Perform with musical instruments	.4779
308.	Work with things	.4703
69.	Draw furniture design	.4685
13.	Develop ideas for TV commercials	.4583
197.	Make television commercials	.4536
317.	Do things with color	.4472
65.	Design furniture	.4423
188.	Play in a dance band	.4405

Continued, next page

Table 9 continued

24.	Attend sports photography show	.4349
99.	Collect cuisine	.4247
134.	Play in a symphony orchestra	.4202
201.	Make appearance of products more attractive	.4135
32.	Write songs	.4112
236.	Actor/actress	.4108
222.	Newspaper reporter	.4036
180.	Play a role in a motion picture film	.3974
163.	Make craft with hands	.3963
230.	Industrial designer	.3754
22.	Make cartoon pictures	.3732
294.	Conductor	.3724
50.	Make musical instruments	.3682
5.	Feed animals	.3514
312.	Do outdoor work	.3455
278.	Photographer	.3340
131.	Investigate the nutrition of food	.3229
4.	Direct a play	.3223

Factor 4. Mechanical

74.	Fix problems of cars	.5881
110.	Inspect electronic devices	.5382
100.	Fix household appliance	.5312
141.	Solve problems in electronic equipment	.4989
9.	Repair radio and television sets	.4572
112.	Find the cause why cars break down	.4307
102.	Take clock apart to see what is wrong	.4297
83.	Design a television set	.4214
96.	Design automobiles	.4117
93.	Drive trucks	.4097
103.	Travel to a farm to make emergency repair	.4058
114.	Inspect machines	.3905
142.	Build furniture	.3752
41.	Take care of trees	.3732
120.	Design refrigerators	.3668
15.	Design blue print for a bridge	.3174
192.	Design a dam project	.2954

Continued, next page

Table 9 continued

Factor 5. Clerical

73.	Receive and send messages	.4457
3.	Organize books in categories	.4132
219.	Handle letters, documents, and reports	.3914
44.	File documents	.3817
135.	Type a letter	.3790
154.	Arrange files alphabetically	.3227
61.	Operate telephone switchboard	.2862
56.	Buy material for the company or/office	.2781
315.	Do repetitive tasks	.2642

Factor 6. Legal

113.	Negotiate the settlement of legal problems	.3363
54.	Advise people about their rights and responsibilities	.3062
233.	Judge	.2981
301.	Lawyer	.2998
94.	Prepare legal documents	.3974
273.	Corporation lawyer	.3436

Factor 7. Service

257.	Nurse	.6658
256.	Physical therapist	.6458
238.	Radiology technologist	.6428
243.	Appliance repairer	.6329
237.	Postman	.6304
262.	Carpenter	.6263
211.	Guide the customer in restaurant	.6241
245.	Farm equipment mechanic	.6046
123.	Pull out bad teeth	.5942
296.	Bus driver	.5881
259.	Dentist	.5875
255.	Shoe repairer	.5817
270.	Barber/hair dresser	.5798
283.	Automobile mechanic	.5727
285.	Electrician	.5660
274.	Agricultural engineer	.5656
241.	Veterinarian	.5586

Continued, next page



Table 9 continued

268.	Waiter/waitress	.5416
118.	Make artificial dentures	.5336
190.	Give vaccinations to patients	.5255
258.	Optometrist	.5221
293.	Taxicab driver	.5187
298.	Telephone operator	.5137
292.	Dancer	.5110
156.	Take care of patients in hospital	.5059
305.	Farmer	.5049
240.	Machinery repairer	.5003
183.	Dance on stage	.4984
247.	Soil scientist	.4818
107.	Replace worn soles and heels	.4800
168.	Drive buses	.4757
239.	Medical laboratory worker	.4659
136.	Sort mail	.4544
263.	Sales worker	.4542
106.	Repair malfunctioning tractors	.4470
299.	Purchasing agent	.4416
280.	Craft person	.4408
195.	Sing in a bar	.4169
260.	Physician	.4101
158.	Rehabilitate the physically disabled	.4021
173.	Write case notes	.3907
58.	Serve food and beverages in restaurants	.3899
189.	Memorize stage lines	.3868
198.	Operate sewing machine	.3857
276.	Civil engineer	.3843
225.	Pharmacist	.3836
68.	Sell bus tickets	.3813
186.	Do book-keeping	.3750
161.	Give medicine by prescription	.3739
17.	Make hair for customers in a beauty salon	.3738
297.	Secretary	.3737
284.	Surgeon	.3652
216.	Write on commercial envelopes	.3567
261.	Flight attendant	.3402
306.	Self employed	.3310
191.	Treat sick animals	.3294
281.	Librarian	.3235
124.	Examine eyes	.3179
242.	Dietitian	.3051

Continued, next page

Table 9 continued

175.	Demonstrate to new stewardess how to serve customers	.3049
217.	Explain job requirements to the new employed	.2982
12.	Communicate with customers	.2962
38.	Repair musical instruments	.2960
213.	Help cripple children practice walk	.2942
155.	Analyze the distribution of land, water, climate and vegetation	2917
59.	Cut hair	.2849
185.	Train state troopers	.2600

Table 10. Rotated Factor Loadings on 323 Items of CVII by 192 Chinese Female Students of Secondary School

Factor 1. Scientific & Technical

Item Number	Content	Factor Loadings
72.	Develop scientific equipment	.6971
39.	Create a model of a new machine	.6289
87.	Develop new mathematical principles	.6250
110.	Inspect electronic devices	.6248
100.	Fix household appliance	.6110
96.	Design automobiles	.6091
89.	Investigate the composition of matter	.6009
114.	Inspect machines	.5923
141.	Solve problems in electronic equipment	.5867
248.	Physicist	.5835
295.	Electrical engineer	.5736
253.	Biochemist	.5559
83.	Design a television set	.5540
157.	Apply mathematical theories to solve problems	.5536
125.	Create new chemical products	.5517
8.	Solve a difficult mathematic problem	.5498
254.	Mathematician	.5461
112.	Find the cause why cars break down	.5443
272.	Mechanical engineer	.5440
252.	Chemist	.5432
9.	Repair radio and television sets	.5395
23.	Explain experiment data	.5384
106.	Repair malfunctioning tractors	.5290
192.	Design a dam project	.5274
103.	Travel to a farm to make emergency repair	.5258
151.	Exam the chemical and physical properties of specimens	.5239
275.	Chemical engineer	.5238
74.	Fix problems of cars	.4845
88.	Study the soil	.4833
120.	Design refrigerators	.4766
178.	Repair computers	.4705
97.	Study the structure of the universe and interaction of matter and energy	.4642
116.	Study the chemistry of living things	.4411

Continued, next page



Table 10 continued

115.	Evaluate information from photographs taken from aircraft or satellites	.4380
128.	Develop new products	.4374
251.	Geologist	.4353
98.	Undertake chemical experiment	.4351
86.	Locate natural resources	.4213
95.	Describe the fundamental forces and laws of nature	.4179
226.	Meteorologist	.4168
50.	Make musical instruments	.4153
155.	Analyze the distribution of land, water, climate and vegetation	.4126
35.	Design computer operating system	.4071
276.	Civil engineer	.4065
138.	See slight difference in lab samples	.4043
102.	Take clock apart to see what is wrong	.4000
70.	Analyze products	.3981
34.	Testing soil for fertilization	.3875
6.	Design a computer program	.3853
199.	Grow crops	.3820
66.	Fly an airplane	.3802
247.	Soil scientist	.3671
282.	Airplane pilot	.3530
322.	Work with mind	.3456
142.	Build furniture	.3418
28.	Operate lab equipments	.3383
215.	Inspect quality of product	.3373
15.	Design blue print for a bridge	.3355
153.	Prevent forestry and soil from disease	.3309
93.	Drive trucks	.3273
38.	Repair musical instruments	.3169
196.	Make detail drawings of buildings	.3012
145.	Use microscope	.2906
71.	Plan construction of buildings	.2904
27.	Conduct quality control studies	.2698

Factor 2. Business

109.	Help government make economical policy	.6840
81.	Direct a business	.6539
49.	Develop a financial plan	.6314
84.	Understand financial market	.6187
210.	Advise government officials on international relations	.6104

Continued, next page

Table 10 continued

91.	Propose management strategy for your company	.6072
220.	Prepare a business agreement	.6015
207.	Conduct legal business transaction	.5963
111.	Decide employees' salary and benefits	.5947
148.	Establish a business	.5898
85.	Communicate with business circle	.5738
273.	Corporation lawyer	.5504
43.	Organize a social party	.5473
105.	Design insurance and pension plan	.5095
53.	Manage a hotel	.5008
144.	Participate in developing laws	.4976
147.	Instruct passengers	.4961
47.	Write a business report	.4922
80.	Make policy for an organization	.4907
7.	Interview a business manager	.4696
55.	Help your organization maintain good working relationship with business community and public	.4624
307.	Work with people	.4536
249.	Manager	.4497
127.	Enforce policy in an organization	.4424
20.	Negotiate price of an item or service	.4405
10.	Trade stocks and bonds	.4385
264.	Hotel manager	.4380
314.	Do competitive work	.4331
194.	Provide news information for media	.4325
16.	Develop a budget plan	.4317
164.	Analyze the relationship between supply of goods and demand	.4282
44.	File documents	.4203
64.	Convince people to buy your product	.4146
174.	Study the functioning of governments	.4010
2.	Write an article about economy	.3987
300.	Public relations worker	.3956
175.	Demonstrate to new stewardess how to serve customers	.3934
246.	Computer technician	.3872
63.	Make information available to public	.3863
230.	Industrial designer	.3741
14.	Supervise employees	.3703
302.	Accountant	.3691
67.	Handling check transactions	.3640
52.	Satisfy guests	.3630
250.	Government official	.3556
45.	Explain how to use computer	.3527

Continued, next page

Table 10 continued

165.	Explain the reason for inflation	.3383
54.	Advise people about their rights and responsibilities	.3212
57.	Speak in front of group of people	.3020
303.	Computer programmer	.2907
160.	Response to problems raised by customers	.2753
73.	Receive and send messages	.2725
135.	Type a letter	.2573

Factor 3. Service

298.	Telephone operator	.6665
237.	Postman	.6245
283.	Automobile mechanic	.5997
296.	Bus driver	.5786
255.	Shoe repairer	.5773
245.	Farm equipment mechanic	.5718
305.	Farmer	.5548
293.	Taxicab driver	.5387
262.	Carpenter	.5332
219.	Handle letters, documents, and reports	.5282
243.	Appliance repairer	.5229
285.	Electrician	.5198
265.	Elementary school teacher	.5172
240.	Machinery repairer	.4970
270.	Barber/hair dresser	.4950
211.	Guide the customer in restaurant	.4845
168.	Drive buses	.4671
107.	Replace worn soles and heels	.4661
239.	Medical laboratory worker	.4612
299.	Purchasing agent	.4592
263.	Sales worker	.4534
268.	Waiter/waitress	.4430
68.	Sell bus tickets	.4280
274.	Agricultural engineer	.4211
304.	Bank clerk	.4158
315.	Do repetitive tasks	.3985
61.	Operate telephone switchboard	.3904
306.	Self employed	.3902
136.	Sort mail	.3866
58.	Serve food and beverages in restaurants	.3791
158.	Rehabilitate the physically disabled	.3732
316.	Use numbers at work	.3676

Continued, next page



Table 10 continued

198.	Operate sewing machine	.3675
216.	Write on commercial envelopes	.3623
186.	Do book-keeping	.3380
281.	Librarian	.3170
217.	Explain job requirements to the new employed	.2879
308.	Work with things	.2677

Factor 4. Medical

258.	Optometrist	.7230
187.	Examine patient to diagnose illness	.6765
260.	Physician	.6711
284.	Surgeon	.6245
259.	Dentist	.6240
130.	Perform surgical operation on human beings	.6126
161.	Give medicine by prescription	.5783
225.	Pharmacist	.5744
140.	Analyze the blood, tissues and fluid in the human body	.5368
203.	Advise people about medicine	.5258
257.	Nurse	.5105
191.	Treat sick animals	.5076
11.	Study acupuncture	.4874
133.	Diagnose animal's disease	.4774
256.	Physical therapist	.4768
124.	Examine eyes	.4715
156.	Take care of patients in hospital	.4694
173.	Write case notes	.4634
76.	Understand how human body functions	.4528
190.	Give vaccinations to patients	.4470
118.	Make artificial dentures	.4391
182.	Study geography of different countries in the world	.4317
238.	Radiology technologist	.4005
132.	Give warning of natural disasters	.3848
167.	Forecast the weather	.3791
92.	Prescribe medicine	.3726
166.	Analyze weather information	.3701
149.	Take X-ray picture	.3636
241.	Veterinarian	.3636
171.	Teach geography in school	.3487
123.	Pull out bad teeth	.3321
79.	Perform surgery on sick or injured animals	.3194
19.	Write a lab report	.3121

Continued, next page

Table 10 continued

Factor 5. Scholastic

152.	Prepare lectures for a course	.5613
117.	Explain the present based on the knowledge of the past	.5338
269.	Secondary school teacher	.5166
62.	Teach a classroom of students	.4889
205.	Study people's language	.4720
172.	Write about the past events	.4601
212.	Help people solve their personal problems as well as social problems	.4574
290.	Sociologist	.4565
214.	Help students with their learning strategy	.4537
179.	Study social organizations	.4536
177.	Study family relationships	.4513
90.	Correct assignments for the class	.4508
206.	Translate English book to Chinese	.4323
169.	Give advice on good eating habits	.4196
101.	Advise people about nutrition of food	.4173
213.	Help cripple children practice walk	.4168
143.	Study community life	.4159
119.	mediate estrangement between friends	.3989
131.	Investigate the nutrition of food	.3974
318.	Use language skill at work	.3769
289.	Psychologist	.3714
137.	Teach about past events	.3714
271.	College teacher	.3696
242.	Dietitian	.3588
18.	Study Confucianism	.3494
104.	Understand human mind	.3473
176.	Analyze human behavior	.3453
77.	Edit for writing errors	.3335
37.	Study the structure of the family	.3330
286.	Political scientist	.3307
244.	Food Scientist	.2868
36.	Analyze relationship of groups	.2828
319.	Do detailed tasks	.2657

Factor 6. Artistic

202.	Decorate interior of buildings	.5319
201.	Make appearance of products more attractive	.5169

Continued, next page

Table 10 continued

231.	Costume designer	.5124
235.	Interior designer	.5046
69.	Draw furniture design	.4618
229.	Commercial artist	.4563
200.	Design new costumes	.4506
13.	Develop ideas for TV commercials	.4289
22.	Make cartoon pictures	.4277
139.	Create new food dishes	.4059
317.	Do things with color	.3991
33.	Decorate an exhibition	.3988
48.	Design a poster for a product	.3980
159.	Plan nutritious and appetizing foods	.3919
99.	Collect cuisine	.3712
280.	Craft person	.3645
197.	Make television commercials	.3554
218.	Suggest customers their appropriate hair style	.3473
267.	Chef	.3434
297.	Secretary	.3358
4.	Direct a play	.3354
163.	Make craft with hands	.3297
1.	Design an oil painting	.3101

Factor 7. Performing Art

291.	Musician	.6808
184.	Perform with musical instruments	.6804
134.	Play in a symphony orchestra	.6755
183.	Dance on stage	.6525
228.	Singer	.6409
292.	Dancer	.6321
122.	Sing in choral groups	.6125
193.	Sing in a concert hall	.6026
188.	Play in a dance band	.5919
236.	Actor/actress	.5602
294.	Conductor	.5488
234.	Radio and television announcer	.5089
32.	Write songs	.5086
261.	Flight attendant	.4503
180.	Play a role in a motion picture film	.4418
195.	Sing in a bar	.4127
189.	Memorize stage lines	.3883
170.	Broadcast news over radio or television	.3544

Continued, next page



Table 10 continued

278.	Photographer	.3369
108.	Collect samples of butterfly	.3280
24.	Attend sports photography show	.2926

Factor 8. Legal

78.	Defend criminal case	.6002
277.	Criminal lawyer	.5991
113.	Negotiate the settlement of legal problems	.5908
181.	Investigate criminal case	.5304
233.	Judge	.5049
94.	Prepare legal documents	.4978
30.	Make legal decision in court trials	.4785
301.	Lawyer	.4696
266.	Police officer	.4480
60.	Capture criminals	.4300
162.	Research legal document	.4060
121.	Explain abnormal behavior of individuals and groups	.3334
42.	Study the political system	.2979
185.	Train state troopers	.2824

Factor 9. Journalism

51.	Participate photographic competition	.4819
209.	Gather information on current events	.4644
126.	Interview people for newspaper article	.4401
223.	Newspaper reporter	.4128
208.	Write story for newspaper	.3802
204.	Use camera to portray people, places and events	.3624

Table 11. Factors Resulting from Principal Component Analysis of Chinese Vocational Interests Inventory

Resulting factors Male and female students (N=410)	Resulting factors Male high school students (N=204)	Resulting factors Female high school students (N=190)
Medical	Business	Scientific & technical
Business	Scientific & technical	Business
Scientific & technical	Artistic	Service
Artistic creativity	Mechanical	Medical
Scholastic	Clerical	Scholastic
Analytical	Legal	Artistic
Service	Service	Performing art
Legal		Legal
Artistic		Journalism

Table 12. Percentage of Responses to 323 Items of CVII by Male and Female High School Students in Beijing, China ( male=210, female=192)

Item	Content	Like		Dislike	
		Male %	Female %	Male %	Female %
1.	Design an oil painting	31	41	44	27
2.	Write an article about economy	24	17	53	53
3.	Organize books in categories	36	36	47	42
4.	Direct a play	41	58	34	18
5.	Feed animals	72	69	15	14
6.	Design a computer program	52	37	23	34
7.	Interview a business manager	24	45	44	27
8.	Solve a difficult mathematic problem	63	51	20	32
9.	Repair radio and television sets	53	24	26	50
10.	Trade stocks and bonds	52	46	18	18
11.	Study acupuncture	30	26	49	49
12.	Communicate with customers	17	21	57	47
13.	Develop ideas for TV commercials	61	78	18	06
14.	Supervise employees	51	51	21	15
15.	Design blue print for a bridge	42	37	23	23
16.	Develop a budget plan	38	36	30	31
17.	Make hair for customers in a beauty salon	05	06	83	81
18.	Study Confucianism	19	17	58	55
19.	Write a lab report	29	19	47	60
20.	Negotiate price of an item or service	46	46	28	22
21.	Do shorthand	34	39	37	33
22.	Make cartoon pictures	54	67	22	10
23.	plain experiment data	56	40	17	24
24.	Attend sports photography show	54	57	21	13
25.	Manage a farm	34	44	42	31
26.	Prepare receipts for customers	11	07	68	65
27.	Conduct quality control studies	29	23	40	37
28.	Operate lab equipments	60	51	18	30
29.	Carve artistic objects	49	65	30	14
30.	Make legal decision in court trials	55	57	17	13
31.	Write stories	48	64	30	18
32.	Write songs	42	55	37	20
33.	Decorate an exhibition	48	74	28	10
34.	Testing soil for fertilization	18	13	57	55
35.	esign computer operating system	55	31	21	37
36.	Analyze relationship of groups	29	23	42	40
37.	Study the structure of the family	25	24	45	40
38.	Repair musical instruments	26	17	50	53

Continued next page

Table 12 continued

39.	Create a model of a new machine	64	34	18	33
40.	Listen to weather report	51	59	23	18
41.	Take care of trees	49	51	32	27
42.	Study the political system	26	23	54	58
43.	Organize a social party	31	55	41	25
44.	File documents	21	27	53	42
45.	Explain how to use computer	34	18	34	46
46.	Pick up fruit or vegetable	35	40	45	40
47.	Write business report	33	35	45	34
48.	Design a poster for a product	31	57	41	20
49.	Develop a financial plan	49	51	26	22
50.	Make musical instruments	26	25	41	35
51.	Participate photographic competition	47	59	28	19
52.	Satisfy guests	50	52	24	16
53.	Manage a hotel	71	77	12	08
54.	Advise people about their rights and responsibilities	46	52	27	12
55.	Help your organization maintain good working relationship with business community and public	50	54	21	12
56.	Buy material for the company or/office	25	25	41	41
57.	Speak in front of group of people	34	30	40	37
58.	Serve food and beverages in restaurants	09	11	72	67
59.	Cut hair	20	24	62	56
60.	Capture criminals	50	38	25	32
61.	Operate telephone switchboard	24	20	47	45
62.	Teach a classroom of students	29	39	44	38
63.	Make information available to public	45	45	23	14
64.	Convince people to buy your product	52	47	23	23
65.	Design furniture	45	62	25	15
66.	Fly an airplane	70	57	12	17
67.	Handling check transactions	25	21	48	52
68.	Sell bus tickets	17	11	70	74
69.	Draw furniture design	43	57	32	20
70.	Analyze products	39	14	35	44
71.	Plan construction of buildings	45	45	30	28
72.	Develop scientific equipment	53	27	23	41
73.	Receive and send messages	24	21	50	54
74.	Fix problems of cars	30	11	43	68
75.	Prepare examination to the students	37	37	37	44
76.	Understand how human body functions	42	33	28	43
77.	Edit for writing errors	35	42	41	31
78.	Defend criminal case	48	58	33	20

Continued next page



Table 12 continued

79.	Perform surgery on sick or injured animals	37	23	39	57
80.	Make policy for an organization	32	32	39	37
81.	Direct a business	47	45	29	26
82.	Drive a taxicab	34	33	45	45
83.	Design a television set	50	32	27	34
84.	Understand financial market	66	66	18	14
85.	Communicate with business circle	67	67	13	17
86.	Locate natural resources	45	41	25	27
87.	Develop new mathematical principles	38	19	37	57
88.	Study the soil	22	10	58	61
89.	Investigate the composition of matter	39	15	41	57
90.	Correct assignments for the class	23	28	53	47
91.	Propose management strategy for your company	49	53	33	19
92.	Prescribe medicine	29	24	40	38
93.	Drive trucks	28	11	53	68
94.	Prepare legal documents	32	46	38	23
95.	Describe the fundamental forces and laws of nature	41	21	33	36
96.	Design automobiles	33	10	42	62
97.	Study the structure of the universe and interaction of matter and energy	57	37	25	39
98.	Undertake chemical experiment	62	55	21	21
99.	Collect cuisine	44	45	33	27
100.	Fix household appliance	46	20	31	55
101.	Advise people about nutrition of food	33	37	41	38
102.	Take clock apart to see what is wrong	55	41	26	39
103.	Travel to a farm to make emergency repair	18	11	54	66
104.	Understand human mind	56	72	25	10
105.	Design insurance and pension plan	27	19	43	42
106.	Repair malfunctioning tractors	15	04	68	80
107.	Replace worn soles and heels	10	03	73	83
108.	Collect samples of butterfly	43	55	32	24
109.	Help government make economical policy	41	37	38	31
110.	Inspect electronic devices	34	18	41	58
111.	Decide employees' salary and benefits	42	40	37	29
112.	Find the cause why cars break down	31	13	43	61
113.	Negotiate the settlement of legal problems	33	45	39	28
114.	Inspect machines	31	08	42	66
115.	Evaluate information from photographs taken from aircraft or satellites	51	38	19	26
116.	Study the chemistry of living things	50	33	31	32

Continued, next page

Table 12 continued

117.	Explain the present based on the knowledge of the past	35	31	39	41
118.	Make artificial dentures	10	04	75	78
119.	mediate estrangement between friends	55	61	20	11
120.	Design refrigerators	30	23	38	42
121.	Explain abnormal behavior of individuals and groups	34	44	42	30
122.	Sing in choral groups	26	46	54	32
123.	Pull out bad teeth	10	02	72	79
124.	Examine eyes	24	13	54	67
125.	Create new chemical products	41	19	30	53
126.	Interview people for newspaper article	29	56	42	23
127.	Enforce policy in an organization	34	22	42	42
128.	Develop new products	55	39	21	26
129.	Prescribe lenses for eye glasses	20	10	55	65
130.	Perform surgical operation on human beings	38	32	32	42
131.	Investigate the nutrition of food	37	27	41	39
132.	Give warning of natural disasters	36	23	36	39
133.	Diagnose animal's disease	27	22	50	54
134.	Play in a symphony orchestra	33	45	46	30
135.	Type a letter	34	55	40	24
136.	Sort mail	16	10	66	67
137.	Teach about past events	34	31	43	47
138.	See slight difference in lab samples	42	30	31	41
139.	Create new food dishes	41	58	37	22
140.	Analyze the blood, tissues and fluid in the human body	33	20	43	49
141.	Solve problems in electronic equipment	39	16	42	62
142.	Build furniture	24	14	52	60
143.	Study community life	26	27	43	32
144.	Participate in developing laws	42	49	32	27
145.	Use microscope	54	45	22	26
146.	Write a lab report	25	14	46	61
147.	Instruct passengers	40	31	30	34
148.	establish a business	71	82	13	06
149.	Take X-ray picture	21	18	46	46
150.	Follow-up medical doctor's instruction	53	53	26	18
151.	Exam the chemical and physical properties of specimens	43	26	34	48
152.	Prepare lectures for a course	14	20	60	55
153.	Prevent forestry and soil from disease	29	24	43	44
154.	Arrange files alphabetically	21	20	53	49

Continued, next page

Table 12 continued

155.	Analyze the distribution of land, water, climate and vegetation	24	17	51	57
156.	Take care of patients in hospital	17	14	60	63
157.	Apply mathematical theories to solve problems	54	31	26	43
158.	Rehabilitate the physically disabled	22	23	49	45
159.	Plan nutritious and appetizing foods	40	40	31	27
160.	Response to problems raised by customers	31	33	41	35
161.	Give medicine by prescription	27	19	50	56
162.	Research legal document	44	43	33	31
163.	Make craft with hands	58	66	23	13
164.	Analyze the relationship between supply of goods and demand	40	42	33	29
165.	Explain the reason for inflation	39	33	36	31
166.	Analyze weather information	25	17	44	48
167.	Forecast the weather	26	30	46	39
168.	Drive buses	20	11	58	68
169.	Give advice on good eating habits	37	41	31	27
170.	Broadcast news over radio or television	40	56	30	17
171.	Teach geography in school	23	22	50	56
172.	Write about the past events	37	50	38	25
173.	Write case notes	19	14	59	54
174.	Study the functioning of governments	28	23	45	39
175.	Demonstrate to new stewardess how to serve customers	35	48	40	28
176.	Analyze human behavior	44	46	31	27
177.	Study family relationships	31	34	41	36
178.	Repair computers	42	15	35	58
179.	Study social organizations	27	29	42	37
180.	Play a role in a motion picture film	53	68	24	11
181.	Investigate criminal case	58	48	25	26
182.	Study geography of different countries in the world	44	43	36	35
183.	Dance on stage	21	48	61	31
184.	Perform with musical instruments	37	60	40	19
185.	Train state troopers	39	36	37	34
186.	Do book-keeping	18	17	58	60
187.	Examine patient to diagnose illness	20	18	56	57
188.	Play in a dance band	21	31	53	43
189.	Memorize stage lines	20	28	57	46
190.	Give vaccinations to patients	19	10	60	66
191.	Treat sick animals	22	22	57	56
192.	Design a dam project	37	18	36	50
193.	Sing in a concert hall	31	46	46	28

Continued, next page



Table 12 continued

194.	Provide news information for media	38	44	33	27
195.	Sing in a bar	20	21	59	54
196.	Make detail drawings of buildings	37	30	42	44
197.	Make television commercials	48	73	28	11
198.	Operate sewing machine	19	23	57	49
199.	Grow crops	28	20	50	53
200.	Design new costumes	46	78	32	08
201.	Make appearance of products more attractive	61	76	21	09
202.	Decorate interior of buildings	53	77	24	10
203.	Advise people about medicine	25	17	48	47
204.	Use camera to portray people, places and events	39	53	34	24
205.	Study people's language	34	41	38	28
206.	Translate English book to Chinese	29	37	45	33
207.	Conduct legal business transaction	58	68	22	10
208.	Write story for newspaper	30	42	39	29
209.	Gather information on current events	43	35	32	34
210.	Advise government officials on international relations	34	30	36	37
211.	Guide the customer in restaurant	10	10	73	72
212.	Help people solve their personal problems as well as social problems	35	39	38	30
213.	Help cripple children practice walk	29	32	41	36
214.	Help students with their learning strategy	29	33	39	33
215.	Inspect quality of product	31	23	42	42
216.	Write on commercial envelopes	20	16	55	52
217.	Explain job requirements to the new employed	25	24	44	41
218.	Suggest customers their appropriate hair style	25	38	52	32
219.	Handle letters, documents, and reports	15	12	59	59
220.	Prepare a business agreement	33	34	41	34
221.	Decorate shopping window for department store	11	17	25	12
223.	Newspaper reporter	41	58	34	21
224.	Interpreter	35	56	38	22
225.	Pharmacist	23	22	50	48
226.	Meteorologist	23	17	52	56
227.	Architect	42	37	31	38
228.	Singer	30	48	46	29
229.	Commercial artist	48	75	33	10
230.	Industrial designer	37	40	41	27
231.	Costume designer	41	74	38	10
232.	Farmer	30	34	46	41
233.	Judge	50	60	35	17
234.	Radio and television announcer	42	66	38	14

Continued, next page



Table 12 continued

235.	Interior designer	48	70	32	11
236.	Actor/actress	47	60	34	21
237.	Postman	15	13	64	68
238.	Radiology technologist	13	12	66	71
239.	Medical laboratory worker	21	13	57	67
240.	Machinery repairer	21	09	57	73
241.	Veterinarian	19	17	66	63
242.	Dietitian	27	27	50	46
243.	Appliance repairer	15	08	63	74
244.	Food Scientist	32	29	40	46
245.	Farm equipment mechanic	15	07	65	76
246.	Computer technician	46	27	28	45
247.	Soil scientist	23	09	54	65
248.	Physicist	49	24	30	51
249.	Manager	65	67	15	14
250.	Government official	60	47	24	20
251.	Geologist	28	23	45	47
252.	Chemist	47	20	33	49
253.	Biochemist	38	22	35	49
254.	Mathematician	40	23	32	45
255.	Shoe repairer	20	09	56	72
256.	Physical therapist	15	10	61	63
257.	Nurse	11	14	73	66
258.	Optometrist	20	17	63	64
259.	Dentist	16	08	68	69
260.	Physician	21	17	58	61
261.	Flight attendant	26	50	49	31
262.	Carpenter	13	09	67	74
263.	Sales worker	23	17	56	57
264.	Hotel manager	46	51	32	31
265.	Elementary school teacher	16	28	60	51
266.	Police officer	36	36	40	39
267.	Chef	33	23	46	48
268.	Waiter/waitress	17	11	64	68
269.	Secondary school teacher	21	36	53	38
270.	Barber/hair dresser	17	22	63	58
271.	College teacher	39	52	35	26
272.	Mechanical engineer	38	26	38	44
273.	Corporation lawyer	45	49	34	29
274.	Agricultural engineer	21	12	53	63
275.	Chemical engineer	30	16	45	55
276.	Civil engineer	18	14	57	60

Continued, next page

Table 12 continued

277.	Criminal lawyer	38	46	43	33
278.	Photographer	45	58	31	18
279.	Economist	45	50	30	28
280.	Craft person	25	30	48	41
281.	Librarian	28	29	48	43
282.	Airplane pilot	58	47	21	31
283.	Automobile mechanic	16	10	56	73
284.	Surgeon	25	23	50	58
285.	Electrician	22	11	53	72
286.	Political scientist	24	26	54	57
287.	Geographer	28	18	49	54
288.	Historian	30	28	48	47
289.	Psychologist	44	64	35	15
290.	Sociologist	35	48	40	28
291.	Musician	32	50	46	27
292.	Dancer	16	42	62	31
293.	Taxicab driver	22	21	56	59
294.	Conductor	28	37	43	36
295.	Electrical engineer	32	13	43	57
296.	Bus driver	12	05	70	74
297.	Secretary	21	43	56	32
298.	Telephone operator	17	12	59	61
299.	Purchasing agent	21	19	53	57
300.	Public relations worker	28	48	43	28
301.	Lawyer	50	67	27	17
302.	Accountant	31	29	43	44
303.	Computer programmer	46	29	28	42
304.	Bank clerk	37	33	40	38
305.	Farmer	18	12	60	64
306.	Self employed	31	31	44	44
307.	Work with people	59	69	20	14
308.	Work with things	50	41	22	29
309.	Work with many people	48	46	28	23
310.	Work with a few people	50	39	32	30
311.	Work by yourself	41	42	38	32
312.	Do outdoor work	42	52	36	23
313.	Do indoor work	63	59	15	20
314.	Do competitive work	66	65	12	12
315.	Do repetitive tasks	22	16	59	60
316.	Use numbers at work	36	22	39	53
317.	Do things with color	49	73	25	10
318.	Use language skill at work	40	49	32	26

Continued, next page

Table 12 continued

319.	Do detailed tasks	47	42	21	27
320.	Work as a leader	62	68	19	13
321.	Do creative work	73	72	11	08
322.	Work with mind	77	61	10	12
323.	Work with hand	45	46	30	26

Table 13. Mean and Standard Deviation of Responses of Like and Dislike of the 11 Subscales of the CVII by 210 Male and 192 Female Secondary School Students in Beijing, China

Number of Items	Name of Subscales	Like				Dislike			
		Male		Female		Male		Female	
		M	SD	M	SD	M	SD	M	SD
47	Artistic & Cultural	38.49	11.40	53.71	15.79	37.04	10.49	22.17	11.24
74	Scientific Research	37.62	11.93	24.09	10.98	37.57	11.36	46.80	13.34
43	Mechanical & Technology	35.72	12.30	20.98	10.04	31.11	10.54	48.32	12.01
29	Business	40.83	15.72	42.45	17.27	33.72	13.40	29.55	14.37
8	Official	36.63	10.43	36.00	12.56	38.50	8.62	35.38	11.82
10	Education	25.00	8.39	31.20	10.46	48.90	9.55	44.30	10.33
22	Legal Practice	43.82	8.63	48.68	9.63	32.27	7.17	24.73	8.47
43	Medical Science	27.58	12.66	22.98	12.82	48.65	14.60	51.21	15.24
24	Social Science	35.33	10.66	37.42	15.27	39.92	9.00	34.21	12.17
47	Service	27.77	15.33	28.72	18.65	49.60	16.59	46.87	20.15
12	Farmer	32.83	17.20	31.33	21.50	45.00	15.80	45.42	21.40

M=Mean

SD=Standard deviation

Table 14. 84 Occupation Preference between Male and Female Students of Secondary School in Beijing, China (N=410)

Occupational titles		Preferred			Not preferred		
		Men	Women	Z	Men	Women	Z
223.	Newspaper reporter	39	58	-.3.92	33	21	2.68
224.	Interpreter	34	56	-4.47	34	22	2.64
225.	Pharmacist	21	22	-.11	48	48	-.16
226.	Meteorologist	22	17	1.31	50	56	-1.14
227.	Architect	40	37	.51	29	38	-1.89
228.	Singer	29	48	-3.96	43	29	3.13
229.	Commercial artist	45	75	-6.11	31	10	5.22
230.	Industrial designer	36	40	-1.00	39	27	2.52
231.	Costume designer	39	74	-7.27	36	10	6.13
232.	Farmer	29	34	-1.24	44	41	.53
233.	Judge	48	60	-2.44	34	17	3.77
234.	Radio and television announcer	40	66	-5.28	36	14	5.25
235.	Interior designer	46	70	-4.93	31	11	4.98
236.	Actor/actress	44	60	-3.20	32	21	2.46
237.	Postman	14	13	.36	61	68	-1.51
238.	Radiology technologist	12	12	.13	63	71	-1.34
239.	Medical laboratory worker	20	13	2.00	54	67	-2.61
240.	Machinery repairer	20	09	3.10	55	73	-3.84
241.	Veterinarian	18	17	.37	63	63	-.03
242.	Dietitian	26	27	-.20	48	46	.25
243.	Appliance repairer	14	08	1.88	60	74	-3.04
244.	Food Scientist	31	29	.39	38	46	-1.56
245.	Farm equipment mechanic	14	07	2.57	62	76	-3.12
246.	Computer technician	44	27	3.67	27	45	-3.76
247.	Soil scientist	21	09	3.60	52	65	-2.76
248.	Physicist	46	24	4.71	29	51	-4.56
249.	Manager	62	67	-1.20	14	14	.21
250.	Government official	57	47	1.94	23	20	.61
251.	Geologist	27	23	.97	43	47	-.91
252.	Chemist	45	20	5.37	31	49	-3.75
253.	Biochemist	36	22	3.10	34	49	-3.15
254.	Mathematician	38	23	3.15	30	45	-3.14
255.	Shoe repairer	19	09	2.93	53	72	-3.89
256.	Physical therapist	14	10	1.31	58	63	-1.01
257.	Nurse	11	14	-1.08	70	66	.82
258.	Optometrist	19	17	.49	60	64	-.73
259.	Dentist	15	08	2.14	64	69	-.94
260.	Physician	20	17	.59	56	61	-1.05

Continued, next page



Table 14 continued

261.	Flight attendant	25	50	-5.29	47	31	3.23
262.	Carpenter	13	09	1.11	64	74	-2.29
263.	Sales worker	21	17	1.06	54	57	-.69
264.	Hotel manager	44	51	-1.44	31	31	.05
265.	Elementary school teacher	15	28	-3.00	57	51	1.31
266.	Police officer	35	36	-.24	38	39	-.30
267.	Chef	32	23	2.00	43	48	-1.02
268.	Waiter/waitress	16	11	1.54	61	68	-1.51
269.	Secondary school teacher	20	36	3.65	51	38	2.58
270.	Barber/hair dresser	16	22	-1.56	60	58	.44
271.	College teacher	37	52	-2.98	34	26	1.80
272.	Mechanical engineer	36	26	2.17	36	44	-1.53
273.	Corporation lawyer	43	49	-1.22	32	29	.69
274.	Agricultural engineer	20	12	2.19	50	63	-2.51
275.	Chemical engineer	29	16	3.08	43	55	-2.55
276.	Civil engineer	17	14	.85	55	60	-1.03
277.	Criminal lawyer	36	46	-1.95	41	33	1.66
278.	Photographer	43	58	-3.06	30	18	2.72
279.	Economist	43	50	-1.52	29	28	.10
280.	Craft person	24	30	-1.32	45	41	.92
281.	Librarian	27	29	-.44	45	43	.40
282.	Airplane pilot	55	47	1.66	20	31	-2.45
283.	Automobile mechanic	15	10	1.74	54	73	-4.14
284.	Surgeon	24	23	.20	47	58	-2.22
285.	Electrician	21	11	2.73	51	72	-4.47
286.	Political scientist	23	26	-.74	51	57	-1.06
287.	Geographer	27	18	2.13	47	54	-1.49
288.	Historian	29	28	.21	45	47	-.43
289.	Psychologist	42	64	-4.49	33	15	4.20
290.	Sociologist	33	48	-3.05	38	28	2.22
291.	Musician	30	50	-4.06	44	27	3.56
292.	Dancer	15	42	-5.95	59	31	5.73
293.	Taxicab driver	21	21	-.09	54	59	-1.11
294.	Conductor	27	37	-2.20	41	36	1.02
295.	Electrical engineer	30	13	4.16	41	57	-3.14
296.	Bus driver	12	05	2.38	66	74	-1.80
297.	Secretary	20	43	-5.19	53	32	4.31
298.	Telephone operator	16	12	1.06	56	61	-1.06
299.	Purchasing agent	20	19	.06	50	57	-1.35
300.	Public relations worker	27	48	-4.57	41	28	2.79
301.	Lawyer	48	67	-3.82	26	17	2.29
302.	Accountant	29	29	.19	41	44	-.66

Continued, next page

Table 14 continued

303.	Computer programmer	43	29	3.13	27	42	-3.14
304.	Bank clerk	36	33	.61	38	38	.01
305.	Farmer	17	12	1.59	57	64	-1.30
306.	Self employed	29	31	-.37	42	44	-.37

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## CHAPTER 5

### DISCUSSION

The purpose of this study was to develop a paper and pencil instrument which would differentiate among occupational interests of high school students in the People's Republic of China. The research was designed to conduct item screening and to establish the reliability and concurrent validity of the inventory. Finally, the study was to identify certain clusters of interests to form homogeneous subscales so that it could serve the general purpose of career exploration for the high school students in China. Four hundred and fifty four (454) subjects from 4 different high schools in 3 different districts in Beijing, China participated in the research. The reliability study, the validity study, and the factor analysis were then executed. The results of the study have been reported in Chapter 4. The interpretation of these results as well as problems and future suggestions will be discussed in this final chapter.

#### 5.1. Reliability

The internal consistency was used as a measure of reliability of the current version of the inventory. As Table 2 indicated, using Cronbach alpha, the researcher found that the correlation coefficients of the 11 subscales ranged from .75 to .94 with a median of .90. While reliability of vocational test is generally accepted at .85 or higher, the relatively lower categories were Farmer ( $r=.75$ ), Education ( $r=.84$ ) and Leadership ( $r=.75$ ). Relatively low number of items in the above categories, where Farmer contains 12 items, Education 12, and Leadership 8, contributes partially to the

relatively low alpha. The student subjects apparently deviated their responses to the items in the subscales. Therefore, the items in these three subscales may be only used as a moderate indicator of their homogeneity of interests, though it is highly possible that alpha may be well above .80 if using gender-separated samples to measure. The reliability of the inventory based on 323 items was found to be .98. Statistically, Cronbach's alpha would result in similar data as Kuder-Richardson's method which indicates the internal consistency of one single form as opposed to split-half form, and it often provides information for its homogeneity when the coefficient is high. On the whole, these data showed solid statistical internal consistency of each independent subscale and internal consistency of the inventory, suggesting desirable reliability of the inventory. The error variance from this measure is generally attributed to content sampling (Anastasi, 1988). Particularly, these data are also consistent with most of previous reliability studies that employed the same calculations on published vocational interest instruments in the U.S.A.

The preliminary reliabilities of the CVII were encouraging, however more study is needed with a variety of intervals on different scales with gender separated populations.

## 5.2. Content-related validity

The CVII was examined for validity, mainly its content-related validity and concurrent validity. Content-related validity, by definition, according to Anastasi, involves essentially the systematic examination of the test content to determine whether it covers a representative sample of the behavior domain to be measured (Anastasi, 1988). Accordingly, CVII was conceptualized in a similar manner. First, it



defined domain of occupations. Consequently, 11 major occupational domains were decided based on the published statistics from the National Census (1988) of the Labor Department of Chinese government. Second, the most widely held occupational titles under each individual domain were selected as items. For instance, high school teacher under Education domain. Then items of occupational activities of those selected occupational titles were constructed through the description of Occupational Outlook Handbook (1991). Each activity item was designed to particularly, if not exclusively, represent a typical activity of the given occupation.

The inventory was not designed to cover every single job activity, and occupational title. Rather, it is the assumption that this inventory will carry the majority of the most popular and widely held occupational titles and related job activities in PRC labor market. Whether the current reorganization or categorization of occupational domain necessarily represents the actual domain or cluster of occupations remains to be investigated. The factor analysis procedure was in use for this purpose, and the implication of the result will be further discussed later.

### 5.3. Concurrent Validity

Concurrent validity can be established when a test is administered on whom the criterion data are already available (Anastasi, 1988). Endeavor was exerted to identify co-existing criteria to further validate the inventory. The subjects were asked to name three Most-liked occupations and three Least-liked ones on the Information Questionnaire. The data were then processed to serve as biserial variables, and the scores on the related occupational activities were computed as continuous variable.

Thus, the point biserial correlation coefficient was calculated as a measure of concurrent validity.

As the data indicated on Table 4, the gender and age factors were also considered. All correlation coefficients across age (15 to 17) and gender fall into the range of .58 to .74 with a median of .65. The moderately high coefficients were statistically significant from zero at .01 level, and satisfactory as a validity measurement. The data implied the adequate capacity of each category of the CVII and the CVII as a whole to discriminate between those who were interested in the given career and those who were disinterested in the same occupations, suggesting consistency between the self-expressed career and its related activities. Although there is no significant difference among the male subjects of different age, the fact that the correlation coefficient (.74) from the 17-year-old female students was found to be significantly higher ( $p < .05$ ) than the one (.58) from the 15-year-old female subjects suggested career maturity with older female students. Gender difference in such a validity measurement was not found statistically significant. The coefficient based on the total number of subjects was equal to the median of .65, which can be translated to approximately 24% efficacy in predicting "true" career preference.

The problem with this particular type of validity is the limited number of selected occupational titles. In other words, six occupational titles in the Information Questionnaire can only match the relevant occupational activities that is a small portion of the entire job activity item pool. Nevertheless, the six occupational titles, among them, three most liked, and three least liked, perhaps represented subjects' major career interest domain.

Given the above consideration, the relationship between scores on the occupational titles in the inventory and scores on the related occupational activities were also investigated. The results are shown on Table 2 and 3 in Chapter 4. Consequently, the correlation measures produced significant coefficients. Pearson's product moment of all 83 occupational titles and 11 subscales were found to differ significantly from zero at .01 level. The correlation ( $r=.81$ ) between the total occupational activity and occupational title represented a favorable internal validity. The meaning of these results are twofold. Items of occupational titles and items of occupational activities under the title are significantly related, which reflect the initial intention of the inventory design. The coefficients are satisfactory given the fact that the sample size was reasonably large (410) and the participants were high school students whose career maturity is assumed to be lower than adult population in the workforce. Secondly, this measure further validates internal consistency of the inventory, because it is constructed with mainly two parts of the inventory, occupational activities and occupational titles. Although occupational title is part of the inventory, in the meantime it is also a variable as career choice which may be as well considered as an independent variable co-existing at the time of the test. Therefore, it appears that the students' career interests measured are true psychological unities, and consistent at the time of the administration and would be helpful in career planning. The above validity data also illustrated the consistency between students' expressed career interests and inventoried interests which is highly positive, indicating advantage of using stated career interests in career guidance service.



Other information such as academic achievement based on the grades, gender, age, parent's occupation, certainly have great research value and usefulness in career planning.

Interest in different academic subjects of Chinese high school students was designed originally as another criterion validity. However, again, because of its narrowed nature and lack of specificity in relation with particular occupations, it does not appear to be as relevant a criterion as the self-expressed occupational interests. Thus, the relationship between the two was not of current interest.

The variation of previous interest inventories generated different characteristics and recorded different response patterns from diversified populations from students to people in the workforce. The current study included only students. The Chinese workforce will be studied later.

Will different item pool generate different factors? The current form of CVII does not include any non-occupational interest item. However, the question remains, which form is more predictable, occupational activity items or non-occupational items, or, perhaps the combination of both. Longitudinal follow-up studies will be needed. The etiology of career interest development in the United States, according to Strong's study (Strong, 1943), is based on some genuine likes, ability, self-confidence, and face value of certain occupational titles. Unfortunately, there is no direct study in China to answer this question. Until more study is done, the current version of CVII will maintain the focus of assumed dimensions or traits of career interests, which include occupational titles, occupational activities (physical and mental), and general activities (physical and mental). The following section will discuss the results of factor analysis



of the CVII to further illustrate whether the items represent main vocational interest traits and the structure of the inventory.

5.4. Principal Component Analysis

The normal varimax criterion was attempted first for the factor rotation, the method that is commonly used for orthogonal factors. The transformed factor matrix showed the correlations among the 10 extracted factors. Thus, oblique rotation was employed, and it produced low correlation matrix as shown in Table 10 in the preceding chapter. The correlation coefficients ranged from -.05 to .33 with a median of .12. This number indicated the heterogeneous quality among the subscales of the inventory. It is apparent that the new subscales based on the factor results are far more powerful to differentiate from each other than the original subscales.

The ten factors extracted appeared similar to the original subscales or clusters in the inventory. The following table illustrates this resemblance.

Table 15. Comparison between the Eleven Subscales and Nine Extracted Factors

Subscales	Factors
1. Artistic & Cultural	1. Artistic
2. Scientific Research	2. Science & Technology
3. Mechanical & Technological	3. Business
4. Business	4. Artistic Creativity
5. Leadership	5. Scholastic
6. Education	6. Legal
7. Legal Practice	7. Medical
8. Medical Science	8. Analytical
9. Social Science	9. Service
10. Service	
11. Farming	

Artistic was the factor which includes 39 items (see Table 6 in Chapter 4). Thirty seven of them are from the Artistic and Cultural subscale in the CVII, except Flight Attendant and Secretary which are basically service-oriented occupations. Although Flight Attendant has been traditionally a female-dominated career, it enjoys its unique privilege, receives a great amount of public attention, and has great opportunity for travel. The actual percentage ratio of like and dislike of this item is 64/36, which is very high given the factor of gender preference (43/21 in favor of female). Secretary is another example of borderline occupation directly connecting between the professional and service that makes it attractive. The positive and negative percentage response ratio is 76/24 with 50/26 in favor of women. General activity items in this factor, which are Do outdoor work and Do things with color, reflected the characteristics of the profession.

Science and Technology was the second factor. It had 41 items including most of the scientific and technological activities and related job titles with majority of the factor loadings above .40. Interestingly, Airplane pilot and Fly an airplane are also extracted to Science and Technology along with other items. This factor is somewhat different from the original subscales. It combined items from both Scientific Research subscale and Technology from Mechanical and Technology subscale. However, items related to Mechanical activities and occupations did not show in this factor. Instead, they were somehow generated together with most of service-oriented occupations. It appears that the Chinese high school students apparently separated Mechanical work from Technology, which might well be presumed as preference between "white collar

worker" vs. "blue collar worker". The general activity items include Work with mind, Use numbers at work, and Do creative work.

Business, the factor includes 51 items of a variety of business activities and titles combined with leadership positions. The factor loadings are ranging from .31 to .69 with a median of .47 which is substantially high and consistent. General activities in this factor include "Do indoor work", "Work as a leader", and "Work with people". The commonality of business and leadership might be well understood by the concept of power, interest in dealing with people, being in controlling position, excitement of making something happen, and enjoying the outcome of it.

Artistic Creativity was labelled after thorough study of its factor loadings. It contains 29 items. The factor loadings range from .25 to .65 with a median of around .40. The common characteristics of these items appears to be artistic creativity. Occupations include Costume designer, Commercial artist, Craft person, etc. Interestingly, this factor was the result of Oblique rotation. It is moderately correlated with the factor of Artistic (.29). Although whether this factor is truly independent of Artistic is questionable, it provides some information to distinguish the students who enjoy designing or creating things which seem to have more introverted type of artistic quality, from those who undertake performing arts, such as the occupations in show business which by their nature obtain public attention. Note that the item "Collect samples of butterfly" showed its highest loading (.29) in this factor across the board. This item was originally designed for students who are interested in science, especially in biology. It appears a less-valid item even though it could have some statistical meaning in this particular category. Similar items such as "Farmer", "Take care of



trees", and "Design a refrigerator" may not be necessarily connected with the artistic activity, but reflect related interests and perhaps a preference for dealing with things rather than people.

Scholastic has 28 items that contribute to this factor which contains most teaching related occupations and job activities. Interpreter, Sociologist, Librarian and Historian are also in this category. Most confusing occupations filled in here are the Bank clerk and Accountant. Perhaps the connection is that all of these occupations emphasize interests in language and clerical skills.

Legal factor contains 21 items, 14 of them are rather clearcut items designed for legal professionals in the CVII. Four items for psychologist appeared here. Correlations between social service scale (where psychologist belongs) and law scale in SCII are .36 and .45 for male and female respectively. The social subscale and legal subscale are correlated at .67 in the CVII. In using orthogonal rotation, all items for Legal factor were loaded in the Enterprise factor, suggesting that this factor may have a close relationship with Enterprise factor.

Medical factor contains 39 items describing medical professional activities and titles. The factor loadings range from .35 to .75 with a median of .50. So far, it is the strongest factor which is almost identical to the original subscale in the CVII. All Geographer, Meteorologist and Soil scientist items were included in this factor. The relatively low factor loadings between these occupations and the medical professionals may indicate a casual relationship. However, according to Holland's classification, all above occupations are defined in a category of Investigative.



Analytical factor is loaded with only 17 items which are apparently derived from other subscales. Different from other factors, this one does not contain any specific occupations related to the analytical activities. Actually, essence of these items may connect well with John Holland's Investigative type which suggested relevant careers, and the career index may serve a good career reference for students. Furthermore, a correlation study between this factor and Holland's Investigative scale should provide a criterion-related validity for the CVII.

Service is the last factor of this factor solution. It includes 39 items. The factor is similar to John Holland's Conventional category of vocational interests. Under the factor, items are derived from part of Mechanical and Technology subscale, and Service Oriented subscale. Most occupational titles are in service business, including mechanical and electronic repair service. What does this factor mean? Does it mean that students who are interested in one job in the service sector will be likely interested in another service oriented career? Edward Strong (1943) had asked the similar question, he wrote "it is debatable whether factors represented the true interest traits as psychological unities, or are they just a mathematic coordination." For instance, in this factor, most service oriented activities and titles may be the ones that have received the most number of negative responses. Therefore, the factor may merely represent dislike or avoidance of certain occupations and/or related activities.

Traits were assumed to be "enduring psychi and neurological structures located somewhere in the mind or nervous system"(Hogan, DeSoto, and Solano, 1977) Psychologists from Thurstone to Jensen have agreed that traits such as intellect can be externally tested and still reflect inner properties of the individual. But the position

taken by Tryon (1979) and Anastasi (1988) is that traits are learned entities that have validity only with regard to a specific task or situation.

Thurstone (1931) conducted factor analysis on Strong's vocational scales. He identified four factors which he labeled as science, people, language, and business. Strong found similar result. Later, other factor studies based on different design of vocational inventories, subscales and different samples established different structure of factors. Zytowski (1976) identified ten factors in Kuder-DD (Men's Scales) which constituted the ten subscales (Agriculture, Skilled trades, Phys. science, Mathematic-numeric, Psychology, Political science, Language, Art, Medical services, and Helping). Factor analysis studies also confirmed Holland's hexagonal model, which was later adopted by SCII as its main occupational interest themes. CVII, as the writer introduced, has identified nine factors based on 410 Chinese high school student subjects. Interestingly, these nine factors to some extent have some common features with Holland's general occupational themes, as mentioned partially in the preceding sections. These themes are Realistic, Investigative, Artistic, Social, Enterprising, and Conventional. Among the factors in the CVII, Business combining Legal may be converted to Holland's Enterprising, Science and Technology factor linked with Medicine factor is similar to Investigative, and Artistic factor in the CVII is also one of the six themes in Holland's interest theory. These findings suggested construct validity of the CVII, and the universal feature of occupational interests.

Another observation is that the factor analysis reported in this report produced two unique factors, Analytic and Artistic Creativity, which particularly diverged from the rest of the factors. Both activity items and title items were generated from other scales,

specifically for the Analytical factor. Is this phenomenon suggesting some factors independent of occupational clusters which may be unique personality, or psychological traits? Super (1953, 1957) believed that the individual's career choice is the implementation of a self-concept. Career that a person chooses often reflects the person's emotional needs. Occupational adjustment is a major component of general life adjustment. The assessment of vocational interests-and more specifically the identification of those occupational groups whose interests and attitudes the individual shares most closely-thus becomes a focal point in the understanding of different personalities.

Unfortunately, the current factor analysis cannot represent the true workforce, because of the age limitation of the subjects and difference between indirect and direct work experience, or simply because they are students. However, from this sample, it is evident that students from age 15 to 17 have already been maturing in their career decision. It is evidenced by the significant cross correlation coefficients among the items within a particular interest area or another, such as medical, or business, etc. Appendix G lists the complete data of these correlations. It is also evidenced by the low cross-correlation coefficients among the nine factors.

#### 5.5. Gender Difference in Factor Result and Preference of Occupations in the CVII

There are five common factors between male and female students (Table 11). They are Scientific & technical, Business, Artistic, Legal, and Service. Gender specific factors in female students are Performing art, Journalism, Medical, and Scholastic, whereas the unique factors generated from the male student sample include

Mechanical, and Clerical. Factor loadings by female student sample are mostly higher than loadings by the male students, suggesting greater ability of the items in differentiating occupational interests from one to another in female. It indicated possibility that female students reaches their career maturity earlier than the male students, which is evidenced in the United States. Also, the similarity of factors extracted from the combined student sample and from female-only sample implied suitability of CVII for female students, suggesting the validity and advantage of using the gender-separated scales. Age-specific factor analysis for the male students may be needed to generate more differentiative results to provide the guidance in career counseling in China. The gender difference reflected in the factor analysis may be better illustrated by comparing the occupation preference between male and female students. Table 16 below shows the gender difference in the selected occupations.



Table 16. Occupation Preference of Male and Female Students of Secondary School in Beijing, China (male students=210, female=192, total=402)

Male preferred occupation Z (p<.05)		Female preferred occupation Z (p<.05)	
Costume designer	7.27	Chemist	5.37
Commercial artist	6.11	Physicist	4.71
Dancer	5.95	Electrical engineer	3.08
Flight attendant	5.29	Computer technician	3.67
Radio and TV announcer	5.28	Soil scientist	3.60
Secretary	5.19	Mathematician	3.15
Interior designer	4.93	Computer programmer	3.13
Public relation worker	4.57	Biochemist	3.10
Psychologist	4.49	Machinery repairer	3.10
Musician	4.06	Chemical engineer	3.08
Singer	3.96	Shoe repairer	2.93
Newspaper reporter	3.92	Electrician	2.73
Lawyer	3.82	Farm equipment mechanic	2.57
Secondary school teacher	3.65	Bus driver	2.38
Actor/actress	3.20	Agricultural engineer	2.19
Photographer	3.06	Mechanical engineer	2.17
Sociologist	3.05	Dentist	2.14
Elementary school teacher	3.00	Geographer	2.13
College teacher	2.98	Chef	2.00
Judge	2.44		

In agreement with the results of the factor analyses, it appears that female students are significantly in favor of selecting liberal arts, artistic performance, artistic expression, education, and social science-related career, whereas male students are clearly more interested in science, technology, and mechanical type of occupations. In service industry, the female subjects showed strong preference in Flight attendant and Secretary, by contrast, Bus driver, Shoe repairer, and Chef are dominated by the male students. Interestingly, there are more female students who liked to be Lawyer and Judge than the male students. The difference is significant, although the majority of

these occupations in China has been traditionally dominated by male. One explanation may be that the nature of these jobs are more connected to using language expression skill.

#### 5.6. Problems and Suggestions for Future Study

Although the majority of the items in the CVII appears to be at least statistically valid, some items that received low factor loadings need to be further investigated (Table 7). It is rather easier to justify the items describing general work-related activities and work related human environment, such as Work with things, and Work with many people, and so forth. Perhaps because of their general nature these items exist in a variety of occupations. The rest of items on Table 7 may be actually insignificant to all those nine factors. However, using combined student samples may decrease the item differentiation power because the gender difference on items would result multiple low factor loadings. The researcher suggested to use older male students to establish the male-homogeneous scales of vocational interests.

The measure of reliability of the current research only reflects internal consistency of the matched form of CVII. Whether these vocational interests are stable over time is unknown in China. It is imperative that a test-retest reliability be established for the CVII with different intervals, age and gender groups.

Previous research on the validity of vocational interest inventory focused on their predictive validity, which were based on both delayed time effect and a measure of job satisfaction or performance as a criterion following proper prediction of an occupation that the inventory suggested. While the current research was unable to predict whether

the occupation(s) that the CVII suggested would be a proper fit, the question remains, are items representing students' true career interests? Are these interests stable over time? And would they lead to career satisfaction?

Predictive validity of the CVII can be accomplished by two practical methods. The first one is through longitudinal study in which the researcher can collect the data of "hit" rate of the students' placements, and their job satisfaction level. Secondly, it can be done by establishing norm from criterion groups, i.e. 84 occupational groups, and size of each criterion group should be between 300 to 500 according to Strong (1943). By using a proper satisfactory scale on these criterion groups as prediction measure against the scores on CVII may demonstrate predictive validity which is crucial to the development of a career interest inventory for PRC. The standard scores of each group can then be served as criterion to assist student populations in making their career choices.

Although the established overlapping rate among different occupational groups was desirable for the construct validation of occupational interest inventories, overlapping rate is not the subject of the current study. When Edward Strong used the concept overlapping, he meant the overlapping rate among different vocational groups, such as doctors, accountants, etc., who responded to certain items. In CVII, computing overlapping becomes obviously difficult to compare to the results from Strong's study because the sample used in CVII were high school students. However, the overlapping rate is unquestionably important in the future studies applying CVII to a variety of occupational groups. It would be equally important and interesting to investigate the differences of overlapping rate in American culture and Chinese culture. Overall, while



the research data reported here are unable to show item discrimination through overlapping rates as Strong did, they strongly suggest heterogeneous quality among each occupational group evidenced by the low intercorrelation (Table 8), and higher correlations within the group that were homogeneous.

Social economic status certainly played a role in the results. Appendix E, which is derived from Table 12 (Chapter 4), depicts this phenomenon. More students stated they were interested in the professional jobs than the skilled trades. However, it is not necessarily true that the higher social-economic status factor would lead to the students' career decision. For instance, a previous study ( Fredrickson, et al, 1992) indicated that Physician was considered as a job which had the highest social-economic status ranking. But, in the CVII, among the 84 occupations, the Physician was at 61st place selected by the 410 Chinese students as an interested career. A correlation study is needed to investigate the relationship between the social-economic status and vocational interests.

The content of items should be modified in the future along with the change of culture, economy, and restructure of industries in PRC. In addition, the future item pool should contain items of interests of non-occupational activities. They are more than likely to serve the purpose of linking from "play" to "work". From the psychodynamic point of view there may be key factors for career satisfaction. The item pool should also include personality items (drawn from overlapping or general items).



## APPENDIX A

### OCCUPATION CLASSIFICATION IN CHINA AND 11 SUBSCALES IN CVII

1. Artistic and Cultural Orientation Actor/actress, radio and television announcer, singer, commercial artist, industrial designer, costume designer, photographer, musician, translator, dancer, craft person, interior designer, newspaper reporter

1. Design an oil painting
4. Direct a play
13. Develop ideas for TV commercials
22. Make cartoon pictures
24. Attend sports photography show
29. Carve artistic objects
31. Write stories
32. Write songs
33. Decorate an exhibition
38. Repair musical instruments
48. Design a poster for a product
50. Make musical instruments
51. Participate photographic competition
77. Edit for writing errors
122. Sing in choral groups
126. Interview people for newspaper article
134. Play in a symphony orchestra
163. Make craft with hands
170. Broadcast news over radio or television
180. Play a role in a motion picture film
183. Dance on stage
184. Perform with musical instruments
188. Play in a dance band
189. Memorize stage lines
193. Sing in a concert hall
194. Provide news information for media
195. Sing in a bar
197. Make television commercials
198. Operate sewing machine
200. Design new costumes
201. Make appearance of products more attractive
202. Decorate interior of buildings
204. Use camera to portray people, places and events
205. Study people's language
206. Translate English book to Chinese
208. Write story for newspaper
209. Gather information on current events
221. Decorate shopping window for department store
223. Newspaper reporter
224. Interpreter

Continued, next page

Appendix A continued

- 228. Singer
- 229. Commercial artist
- 230. Industrial designer
- 231. Costume designer
- 234. Radio and television announcer
- 235. Interior designer
- 236. Actor/actress
- 278. Photographer
- 291. Musician
- 292. Dancer

2. Scientific Research Orientation    Mathematician, physicist, chemist, biologist, food scientist, soil scientist, geologist, librarian, political scientist, geographer, biochemist, meteorologist

- 8. Solve a difficult mathematic problem
- 23. Explain experiment data
- 26. Prepare receipts for customers
- 86. Locate natural resources
- 87. Develop new mathematical principles
- 88. Study the soil
- 89. Investigate the composition of matter
- 95. Describe the fundamental forces and laws of nature
- 97. Study the structure of the universe and interaction of matter and energy
- 108. Collect samples of butterfly
- 115. Evaluate information from photographs taken from aircraft or satellites
- 116. Study the chemistry of living things
- 125. Create new chemical products
- 132. Give warning of natural disasters
- 151. Exam the chemical and physical properties of specimens
- 155. Analyze the distribution of land, water, climate and vegetation
- 157. Apply mathematical theories to solve problems
- 166. Analyze weather information
- 167. Forecast the weather
- 182. Study geography of different countries in the world
- 226. Meteorologist
- 227. Architect
- 244. Food Scientist
- 247. Soil scientist
- 248. Physicist
- 251. Geologist
- 252. Chemist

Continued, next page

## Appendix A continued

- 253. Biochemist
- 254. Mathematician
- 281. Librarian
- 287. Geographer

3. Mechanical and Technological Orientation Civil engineer, electronic engineer, machinist, chemical engineer, architect, machinery repairer, appliance repairer, farm equipment mechanic, computer technician, electrician, mechanical engineer, agriculture engineer, automobile mechanic, computer programmer

- 6. Design a computer program
- 9. Repair radio and television sets
- 15. Design blue print for a bridge
- 27. Conduct quality control studies
- 28. Operate lab equipments
- 35. Design computer operating system
- 39. Create a model of a new machine
- 45. Explain how to use computer
- 65. Design furniture
- 70. Analyze products
- 71. Plan construction of buildings
- 72. Develop scientific equipment
- 74. Fix problems of cars
- 83. Design a television set
- 96. Design automobiles
- 98. Undertake chemical experiment
- 100. Fix household appliance
- 102. Take clock apart to see what is wrong
- 103. Travel to a farm to make emergency repair
- 106. Repair malfunctioning tractors
- 110. Inspect electronic devices
- 112. Find the cause why cars break down
- 114. Inspect machines
- 120. Design refrigerators
- 128. Develop new products
- 141. Solve problems in electronic equipment
- 142. Build furniture
- 178. Repair computers
- 192. Design a dam project
- 196. Make detail drawings of buildings
- 215. Inspect quality of product
- 240. Machinery repairer

Continued, next page



## Appendix A continued

- 243. Appliance repairer
- 246. Computer technician
- 272. Mechanical engineer
- 274. Agricultural engineer
- 275. Chemical engineer
- 276. Civil engineer
- 283. Automobile mechanic
- 285. Electrician
- 295. Electrical engineer
- 303. Computer programmer

4. Business Orientation Accountant, sales worker, purchasing agent, public relations worker, actuary, bank clerk, hotel manager, and manager

- 7. Interview a business manager
- 10. Trade stocks and bonds
- 12. Communicate with customers
- 14. Supervise employees
- 16. Develop a budget plan
- 20. Negotiate price of an item or service
- 47. Write business report
- 49. Develop a financial plan
- 53. Manage a hotel
- 55. Help your organization maintain good working relationship with business community and public
- 56. Buy material for the company or/office
- 63. Make information available to public
- 64. Convince people to buy your product
- 67. Handling check transactions
- 81. Direct a business
- 84. Understand financial market
- 85. Communicate with business circle
- 91. Propose management strategy for your company
- 105. Design insurance and pension plan
- 111. Decide employees' salary and benefits
- 148. Establish a business
- 160. Response to problems raised by customers
- 186. Do book-keeping
- 217. Explain job requirements to the new employed
- 249. Manager
- 264. Hotel manager
- 302. Accountant

Continued, next page

## Appendix A continued

- 299. Purchasing agent
- 300. Public relations worker
- 304. Bank clerk

### 5. Political and Leadership Orientation Government officials

- 42. Study the political system
- 43. Organize a social party
- 57. Speak in front of group of people
- 80. Make policy for an organization
- 127. Enforce policy in an organization
- 210. Advise government officials on international relations
- 250. Government official

### 6. Educational Orientation College professor, high school teacher, elementary school teacher

- 18. Study Confucianism
- 62. Teach a classroom of students
- 75. Prepare examination to the students
- 90. Correct assignments for the class
- 152. Prepare lectures for a course
- 171. Teach geography in school
- 214. Help students with their learning strategy
- 265. Elementary school teacher
- 269. Secondary school teacher
- 271. College teacher

### 7. Legal Practice Orientation Judge, lawyer, corporation lawyer, criminal lawyer, police officer

- 30. Make legal decision in court trials
- 54. Advise people about their rights and responsibilities
- 60. Capture criminals
- 78. Defend criminal case
- 94. Prepare legal documents
- 113. Negotiate the settlement of legal problems
- 119. Mediate estrangement between friends
- 144. Participate in developing laws
- 162. Research legal document
- 181. Investigate criminal case
- 185. Train state troopers

Continued, next page

Appendix A continued

- 207. Conduct legal business transaction
- 220. Prepare a business agreement
- 233. Judge
- 266. Police officer
- 273. Corporation lawyer
- 277. Criminal lawyer
- 301. Lawyer

8. Medical Science Orientation Traditional medical doctor, physician, pharmacist, nurse, medical technician, surgeon, physical therapist, radiology technologist, dietitian, optometrist, dentist and veterinarian.

- 11. Study acupuncture
- 19. Write a lab report
- 76. Understand how human body functions
- 79. Perform surgery on sick or injured animals
- 92. Prescribe medicine
- 101. Advise people about nutrition of food
- 118. Make artificial dentures
- 121. Explain abnormal behavior of individuals and groups
- 123. Pull out bad teeth
- 124. Examine eyes
- 129. Prescribe lenses for eye glasses
- 130. Perform surgical operation on human beings
- 131. Investigate the nutrition of food
- 133. Diagnose animal's disease
- 138. See slight difference in lab samples
- 145. Use microscope
- 146. Write a lab report
- 149. Take X-ray picture
- 150. Follow-up medical doctor's instruction
- 156. Take care of patients in hospital
- 158. Rehabilitate the physically disabled
- 159. Plan nutritious and appetizing foods
- 161. Give medicine by prescription
- 169. Give advice on good eating habits
- 173. Write case notes
- 187. Examine patient to diagnose illness
- 190. Give vaccinations to patients
- 191. Treat sick animals
- 203. Advise people about medicine
- 213. Help cripple children practice walk

Continued, next page

## Appendix A continued

- 225. Pharmacist
- 238. Radiology technologist
- 239. Medical laboratory worker
- 241. Veterinarian
- 242. Dietitian
- 256. Physical therapist
- 257. Nurse
- 258. Optometrist
- 259. Dentist
- 260. Physician
- 284. Surgeon

### 9. Social science orientation   sociologist, psychologist, historian, and economist.

- 2. Write an article about economy
- 36. Analyze relationship of groups
- 37. Study the structure of the family
- 104. Understand human mind
- 109. Help government make economical policy
- 117. Explain the present based on the knowledge of the past
- 121. Explain abnormal behavior of individuals and groups
- 137. Teach about past events
- 143. Study community life
- 164. Analyze the relationship between supply and demand
- 165. Explain the reason for inflation
- 172. Write about the past events
- 173. Write case notes
- 174. Study the functioning of governments
- 176. Analyze human behavior
- 177. Study family relationships
- 179. Study social organizations
- 212. Help people solve their personal problems as well as social problems
- 279. Economist
- 286. Political scientist
- 288. Historian
- 289. Psychologist
- 290. Sociologist

### 10. Service Orientation   Postman, shoe repairer, flight attendant, carpenter, airplane pilot, taxicab driver, conductor, bus driver, truck driver, secretary, telephone operator, cook/chef, waiters/waitress, barber

Continued, next page



Appendix A continued

3. Organize books in categories
17. Make hair for customers in a beauty salon
21. Do shorthand
26. Prepare receipts for customers
44. File documents
52. Satisfy guests
58. Serve food and beverages in restaurants
59. Cut hair
61. Operate telephone switchboard
66. Fly an airplane
68. Sell bus tickets
73. Receive and send messages
82. Drive a taxicab
93. Drive trucks
99. Collect cook cuisine
107. Replace worn soles and heels
135. Type a letter
136. Sort mail
139. Create new food dishes
140. Analyze the blood, tissues and fluid in the human body
147. Instruct passengers
154. Arrange files alphabetically
168. Drive buses
175. Demonstrate to new stewardess how to serve customers
211. Guide the customer in restaurant
216. Write on commercial envelopes
218. Suggest customers their appropriate hair style
219. Handle letters, documents, and reports
237. Postman
255. Shoe repairer
261. Flight attendant
262. Carpenter
263. Sales worker
267. Chef
268. Waiter/waitress
270. Barber/hair dresser
282. Airplane pilot
293. Taxicab driver
294. Conductor
296. Bus driver
297. Secretary
298. Telephone operator

Continued, next page

## Appendix A continued

- 280. Craft person
- 306. Self employed

### 11. Farming Orientation Farmer

- 5. Feed animals
- 25. Manage a farm
- 34. Testing soil for fertilization
- 40. Listen to weather report
- 41. Take care of trees
- 46. Pick up fruit or vegetable
- 153. Prevent forestry and soil from disease
- 199. Grow crops
- 232. Farmer
- 245. Farm equipment mechanic

### General activities

- 307. Work with people
- 308. Work with things
- 309. Work with many people
- 310. Work with a few people
- 311. Work by yourself
- 312. Do outdoor work
- 313. Do indoor work
- 314. Do competitive work
- 315. Do repetitive tasks
- 316. Use numbers at work
- 317. Do things with color
- 318. Use language skill at work
- 319. Do detailed tasks
- 320. Work as a leader
- 321. Do creative work
- 322. Work with mind
- 323. Work with hand

APPENDIX B

CHINA VOCATIONAL INTEREST INVENTORY (ENGLISH)

Please answer the following questions:

Age:\_\_\_\_\_ Sex:\_\_\_\_\_ Grade:\_\_\_\_\_ GPA \_\_\_\_\_

Father's Occupation(s):\_\_\_\_\_

Would you like to follow his profession(s)?\_\_\_\_\_

Mother's Occupation(s):\_\_\_\_\_

Would you like to follow her profession(s)?\_\_\_\_\_

Please name three of your most favorite subjects, and then circle your performance level to the best of your knowledge:

1. \_\_\_\_\_ A B C D

2. \_\_\_\_\_ A B C D

3. \_\_\_\_\_ A B C D

Other \_\_\_\_\_ A B C D

Please name three of your least favorite subjects, and then circle your performance level to the best of your knowledge:

1. \_\_\_\_\_ A B C D

2. \_\_\_\_\_ A B C D

3. \_\_\_\_\_ A B C D

Other \_\_\_\_\_ A B C D

Please list three occupations you like the most:

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

Please list three occupations you like the least:

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

What are some of your hobbies ? Please name three:

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_



## DIRECTION:

This interest inventory is designed to help you identify what kinds of work you might like to do. It contains occupational and non-occupational activities, and occupational titles.

In this inventory you will find five (5) choices on the right of each statement, i.e. A, B, C, D, and E. These choices represent one's preference of activity or occupation. Choose A when you strongly like the item; B when you like it; C when you feel indifferent about it; D when you dislike it; and circle E when you strongly dislike the statement. There are no right or wrong answer. Read each statement carefully and decide which choice you prefer. For example:

Participate in a speech competition                      A   B   C   D   E

A = Strongly like (participating in a speech competition)

B = Like (participating in a speech competition)

C = Indifference

D = Dislike (participating in a speech competition)

E = Strongly dislike (participating in a speech competition)

Circle only one choice of each statement with pencil or pen.

When you are making your choice , please disregard the amount of money you would make or whether you have enough education or training for the job. And don't be concerned about whether the activity or occupation has been commonly thought of as "male" or female". Work quickly, without thinking of specific examples, your first impression is usually best.

Please be certain that you have completed every items.

How much do you like to...

1. Design an oil painting
2. Write an article about economy
3. Organize books in categories
4. Direct a play
5. Feed animals
6. Design a computer program
7. Interview a business manager
8. Solve a difficult mathematic problem
9. Repair radio and television sets
10. Trade stocks and bonds
11. Study acupuncture
12. Communicate with customers
13. Develop ideas for TV commercials
14. Supervise employees
15. Design blue print for a bridge
16. Develop a budget plan
17. Make hair for customers in a beauty salon
18. Study Confucianism
19. Write a lab report
20. Negotiate price of an item or service
21. Do shorthand
22. Make cartoon pictures
23. Explain experiment data
24. Attend sports photography show
25. Manage a farm
26. Prepare receipts for customers
27. Conduct quality control studies
28. Operate lab equipments
29. Carve artistic objects
30. Make legal decision in court trials
31. Write stories
32. Write songs
33. Decorate an exhibition
34. Testing soil for fertilization
35. Design computer operating system
36. Analyze relationship of groups
37. Study the structure of the family
38. Repair musical instruments
39. Create a model of a new machine
40. Listen to weather report
41. Take care of trees
42. Study the political system

Continued, next page

## Appendix B continued

43. Organize a social party
44. File documents
45. Explain how to use computer
46. Pick up fruit or vegetable
47. Write business report
48. Design a poster for a product
49. Develop a financial plan
50. Make musical instruments
51. Participate photographic competition
52. Satisfy guests
53. Manage a hotel
54. Advise people about their rights and responsibilities
55. Help your organization maintain good working relationship with business community and public
56. Buy material for the company or/office
57. Speak in front of group of people
58. Serve food and beverages in restaurants
59. Cut hair
60. Capture criminals
61. Operate telephone switchboard
62. Teach a classroom of students
63. Make information available to public
64. Convince people to buy your product
65. Design furniture
66. Fly an airplane
67. Handling check transactions
68. Sell bus tickets
69. Draw furniture design
70. Analyze products
71. Plan construction of buildings
72. Develop scientific equipment
73. Receive and send messages
74. Fix problems of cars
75. Prepare examination to the students
76. Understand how human body functions
77. Edit for writing errors
78. Defend criminal case
79. Perform surgery on sick or injured animals
80. Make policy for an organization
81. Direct a business
82. Drive a taxicab
83. Design a television set

Continued, next page

Appendix B continued

84. Understand financial market
85. Communicate with business circle
86. Locate natural resources
87. Develop new mathematical principles
88. Study the soil
89. Investigate the composition of matter
90. Correct assignments for the class
91. Propose management strategy for your company
92. Prescribe medicine
93. Drive trucks
94. Prepare legal documents
95. Describe the fundamental forces and laws of nature
96. Design automobiles
97. Study the structure of the universe and interaction of matter and energy
98. Undertake chemical experiment
99. Collect cuisine
100. Fix household appliance
101. Advise people about nutrition of food
102. Take clock apart to see what is wrong
103. Travel to a farm to make emergency repair
104. Understand human mind
105. Design insurance and pension plan
106. Repair malfunctioning tractors
107. Replace worn soles and heels
108. Collect samples of butterfly
109. Help government make economical policy
110. Inspect electronic devices
111. Decide employees' salary and benefits
112. Find the cause why cars break down
113. Negotiate the settlement of legal problems
114. Inspect machines
115. Evaluate information from photographs taken from aircraft or satellites
116. Study the chemistry of living things
117. Explain the present based on the knowledge of the past
118. Make artificial dentures
119. mediate estrangement between friends
120. Design refrigerators
121. Explain abnormal behavior of individuals and groups
122. Sing in choral groups
123. Pull out bad teeth
124. Examine eyes

Continued, next page



## Appendix B continued

125. Create new chemical products
126. Interview people for newspaper article
127. Enforce policy in an organization
128. Develop new products
129. Prescribe lenses for eye glasses
130. Perform surgical operation on human beings
131. Investigate the nutrition of food
132. Give warning of natural disasters
133. Diagnose animal's disease
134. Play in a symphony orchestra
135. Type a letter
136. Sort mail
137. Teach about past events
138. See slight difference in lab samples
139. Create new food dishes
140. Analyze the blood, tissues and fluid in the human body
141. Solve problems in electronic equipment
142. Build furniture
143. Study community life
144. Participate in developing laws
145. Use microscope
146. Write a lab report
147. Instruct passengers
148. Establish a business
149. Take X-ray picture
150. Follow-up medical doctor's instruction
151. Exam the chemical and physical properties of specimens
152. Prepare lectures for a course
153. Prevent forestry and soil from disease
154. Arrange files alphabetically
155. Analyze the distribution of land, water, climate and vegetation
156. Take care of patients in hospital
157. Apply mathematical theories to solve problems
158. Rehabilitate the physically disabled
159. Plan nutritious and appetizing foods
160. Response to problems raised by customers
161. Give medicine by prescription
162. Research legal document
163. Make craft with hands
164. Analyze the relationship between supply of goods and demand
165. Explain the reason for inflation
166. Analyze weather information

Continued, next page

## Appendix B continued

167. Forecast the weather
168. Drive buses
169. Give advice on good eating habits
170. Broadcast news over radio or television
171. Teach geography in school
172. Write about the past events
173. Write case notes
174. Study the functioning of governments
175. Demonstrate to new stewardess how to serve customers
176. Analyze human behavior
177. Study family relationships
178. Repair computers
179. Study social organizations
180. Play a role in a motion picture film
181. Investigate criminal case
182. Study geography of different countries in the world
183. Dance on stage
184. Perform with musical instruments
185. Train state troopers
186. Do book-keeping
187. Examine patient to diagnose illness
188. Play in a dance band
189. Memorize stage lines
190. Give vaccinations to patients
191. Treat sick animals
192. Design a dam project
193. Sing in a concert hall
194. Provide news information for media
195. Sing in a bar
196. Make detail drawings of buildings
197. Make television commercials
198. Operate sewing machine
199. Grow crops
200. Design new costumes
201. Make appearance of products more attractive
202. Decorate interior of buildings
203. Advise people about medicine
204. Use camera to portray people, places and events
205. Study people's language
206. Translate English book to Chinese
207. Conduct legal business transaction
208. Write story for newspaper

Continued, next page

Appendix B continued

- 209. Gather information on current events
- 210. Advise government officials on international relations
- 211. Guide the customer in restaurant
- 212. Help people solve their personal problems as well as social problems
- 213. Help cripple children practice walk
- 214. Help students with their learning strategy
- 215. Inspect quality of product
- 216. Write on commercial envelopes
- 217. Explain job requirements to the new employed
- 218. Suggest customers their appropriate hair style
- 219. Handle letters, documents, and reports
- 220. Prepare a business agreement
- 221. Decorate shopping window for department store
- 223. Newspaper reporter
- 224. Interpreter
- 225. Pharmacist
- 226. Meteorologist
- 227. Architect
- 228. Singer
- 229. Commercial artist
- 230. Industrial designer
- 231. Costume designer
- 232. Farmer
- 233. Judge
- 234. Radio and television announcer
- 235. Interior designer
- 236. Actor/actress
- 237. Postman
- 238. Radiology technologist
- 239. Medical laboratory worker
- 240. Machinery repairer
- 241. Veterinarian
- 242. Dietitian
- 243. Appliance repairer
- 244. Food Scientist
- 245. Farm equipment mechanic
- 246. Computer technician
- 247. Soil scientist
- 248. Physicist
- 249. Manager
- 250. Government official
- 251. Geologist

Continued, next page

Appendix B continued

- 252. Chemist
- 253. Biochemist
- 254. Mathematician
- 255. Shoe repairer
- 256. Physical therapist
- 257. Nurse
- 258. Optometrist
- 259. Dentist
- 260. Physician
- 261. Flight attendant
- 262. Carpenter
- 263. Sales worker
- 264. Hotel manager
- 265. Elementary school teacher
- 266. Police officer
- 267. Chef
- 268. Waiter/waitress
- 269. Secondary school teacher
- 270. Barber/hair dresser
- 271. College teacher
- 272. Mechanical engineer
- 273. Corporation lawyer
- 274. Agricultural engineer
- 275. Chemical engineer
- 276. Civil engineer
- 277. Criminal lawyer
- 278. Photographer
- 279. Economist
- 280. Craft person
- 281. Librarian
- 282. Airplane pilot
- 283. Automobile mechanic
- 284. Surgeon
- 285. Electrician
- 286. Political scientist
- 287. Geographer
- 288. Historian
- 289. Psychologist
- 290. Sociologist
- 291. Musician
- 292. Dancer
- 293. Taxicab driver

Continued, next page



Appendix B continued

- 294. Conductor
- 295. Electrical engineer
- 296. Bus driver
- 297. Secretary
- 298. Telephone operator
- 299. Purchasing agent
- 300. Public relations worker
- 301. Lawyer
- 302. Accountant
- 303. Computer programmer
- 304. Bank clerk
- 305. Farmer
- 306. Self employed
- 307. Work with people
- 308. Work with things
- 309. Work with many people
- 310. Work with a few people
- 311. Work by yourself
- 312. Do outdoor work
- 313. Do indoor work
- 314. Do competitive work
- 315. Do repetitive tasks
- 316. Use numbers at work
- 317. Do things with color
- 318. Use language skill at work
- 319. Do detailed tasks
- 320. Work as a leader
- 321. Do creative work
- 322. Work with mind
- 323. Work with hand

## APPENDIX C

### COMPUTER PROGRAM OF PRINCIPAL COMPONENT ANALYSIS AND INITIAL STATISTICS

```

1  TITLE FACTOR ANALYSIS OF CVII
2  DATA LIST FILE=xing FIXED/id 1-3 item1 TO item323 5-327
3  RECODE item1 TO item323 (4=-1)(5=-2)(3=0)(1=2)(2=1)
4  FACTOR VARIABLES=item1 TO item323/
5  MISSING=MEANSUB/
6  FORMAT=SORT BLANK(.25)/
7  CRITERIA=MINEIGEN(3.7)/
8  CRITERIA=ECONVERGE(0.01)/
9  CRITERIA=RCONVERGE(0.001)/
10 ROTATION=VARIMAX/
11 ROTATION=EQUAMAX/
12 ROTATION=OBLIMIN/
13 ROTATION=QUARTIMAX

```

ANALYSIS: REPLACEMENT OF MISSING VALUES WITH THE MEAN  
EXTRACTION:FOR ANALYSIS 1,PRINCIPAL-COMPONENTS ANALYSIS (PC)

INITIAL STATISTICS:

VARIABLE COMMUNALITY * F EIGENVALUE				PCT OF VAR	CUM PCT	
ITEM1	1.00000	*	1	44.10521	13.7	13.7
ITEM2	1.00000	*	2	22.40438	6.9	20.6
ITEM3	1.00000	*	3	13.15431	4.1	24.7
ITEM4	1.00000	*	4	9.08567	2.8	27.5
ITEM5	1.00000	*	5	6.76337	2.1	29.6
ITEM6	1.00000	*	6	5.55582	1.7	31.3
ITEM7	1.00000	*	7	5.28057	1.6	32.9
ITEM8	1.00000	*	8	4.83720	1.5	34.4
ITEM9	1.00000	*	9	4.46936	1.4	35.8
ITEM10	1.00000	*	10	4.28098	1.3	37.1
ITEM11	1.00000	*	11	3.60017	1.1	38.2
ITEM12	1.00000	*	12	3.47002	1.1	39.3
ITEM13	1.00000	*	13	3.30884	1.0	40.3
ITEM14	1.00000	*	14	3.19071	1.0	41.3
ITEM15	1.00000	*	15	2.96992	.9	42.3
ITEM16	1.00000	*	16	2.83722	.9	43.1
ITEM17	1.00000	*	17	2.77367	.9	44.0
ITEM18	1.00000	*	18	2.72802	.8	44.8
ITEM19	1.00000	*	19	2.61085	.8	45.6
ITEM20	1.00000	*	20	2.57477	.8	46.4
ITEM21	1.00000	*	21	2.54729	.8	47.2
ITEM22	1.00000	*	22	2.51848	.8	48.0
ITEM23	1.00000	*	23	2.40692	.7	48.8
ITEM24	1.00000	*	24	2.34294	.7	49.5
ITEM25	1.00000	*	25	2.30299	.7	50.2

## APPENDIX D

UNROTATED FACTOR LOADINGS, CONTRIBUTIONS (EIGENVALUES),  
AND CALCULATED COMMUNALITY OF 323 ITEMS IN THE CVII



# FACTOR LOADINGS (PRIOR TO ROTATION)

ITEM	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	Communality
1	.212	.178	-.221	.318	-.024	.063	-.073	-.130	-.262	-.092	.331
2	.289	.131	.326	-.194	-.080	.195	-.086	-.163	-.183	.027	.358
3	.191	-.014	-.085	-.007	-.033	.336	.192	.090	.126	.043	.221
4	.210	.379	-.192	.153	-.077	.023	-.074	-.169	-.020	.036	.291
5	.056	.028	-.217	.220	.132	.157	-.090	.206	.106	.125	.220
6	.135	-.160	.357	.168	.231	-.021	.274	.019	-.166	.115	.370
7	.332	.352	.093	-.061	.007	.039	.043	-.131	.004	-.002	.268
8	.246	-.252	.350	.149	.173	-.015	.177	.019	.061	.082	.342
9	.295	-.393	.173	.060	.336	.126	-.070	.006	.090	.047	.420
10	.233	.245	.330	-.014	.187	-.189	-.203	-.025	-.091	.141	.369
11	.392	-.136	-.085	.036	-.167	.070	-.243	.181	-.111	.076	.324
12	.341	.151	-.166	-.171	.066	.121	-.068	.069	-.043	.157	.251
13	.218	.468	-.076	.212	.033	.095	-.117	-.076	-.192	-.113	.398
14	.242	.296	.253	-.088	.003	.046	-.004	-.015	-.203	-.027	.262
15	.353	-.091	.123	.240	.131	.089	.030	-.203	-.152	-.179	.329
16	.312	.161	.192	-.049	.085	.077	.094	.086	-.103	.034	.205
17	.267	.019	-.220	-.196	.119	.180	-.161	.037	.011	.153	.257
18	.370	-.059	.014	-.074	-.277	.191	-.143	-.076	-.093	.043	.297
19	.362	-.200	.040	.219	-.147	.167	-.082	.039	-.152	.103	.313
20	.283	.304	.167	-.148	.132	-.033	-.210	.017	-.011	.102	.297
21	.339	-.028	.054	.009	-.038	.170	.035	.137	-.050	-.010	.172
22	.171	.114	-.180	.357	.041	.101	.042	.067	-.032	-.139	.241
23	.317	-.178	.349	.285	-.057	.095	.127	-.091	.050	.112	.389
24	.330	.145	-.104	.227	.042	.128	-.058	-.164	.063	-.053	.248
25	.269	.067	-.133	.098	.150	.263	-.337	-.020	-.086	.012	.318
26	.341	-.057	-.109	-.078	.028	.239	.086	-.002	-.068	.166	.236
27	.341	.005	.112	-.132	.088	.270	-.001	-.051	-.001	-.037	.232
28	.161	-.215	.176	.214	.116	-.002	.087	.088	.153	.149	.224
29	.260	.154	-.293	.381	.017	.128	-.097	-.110	-.068	-.076	.372
30	.266	.329	.181	-.027	-.083	-.087	-.185	-.033	.246	-.108	.336
31	.221	.294	-.133	.155	-.126	.148	-.082	-.026	.055	-.115	.239
32	.308	.365	-.206	.135	-.164	.029	-.102	-.250	-.093	.168	.427
33	.273	.444	-.230	.292	.087	.089	-.065	.005	-.111	-.096	.452
34	.352	-.292	.039	.126	-.038	.321	-.033	-.088	-.087	-.072	.353
35	.241	-.217	.462	.127	.172	-.088	.216	.058	-.151	.134	.464
36	.219	-.009	.245	-.154	-.082	.351	-.102	.001	.070	.007	.277
37	.324	.171	.068	-.107	-.013	.273	.005	.009	.028	.056	.230
38	.390	-.127	-.111	.167	.009	.121	-.163	-.170	-.052	.127	.298

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Appendix D continued

39	.264	-.305	.308	.319	.235	.013	-.032	-.069	.039	.001	.423
40	.226	.120	-.033	.106	-.008	.148	.133	.172	.105	.047	.161
41	.269	-.094	-.100	.309	.093	.338	-.012	-.001	.031	-.071	.316
42	.274	.097	.281	-.280	-.167	.305	-.136	-.071	-.061	.001	.391
43	.263	.535	.081	-.140	-.007	.022	-.005	.071	-.167	.141	.436
44	.303	.248	.025	-.272	-.047	.171	.187	.010	-.050	.181	.330
45	.305	-.149	.301	.019	.098	.001	.283	.000	-.122	.081	.318
46	.202	-.024	-.281	.093	.134	.326	-.011	.143	.148	.103	.307
47	.382	.345	.216	-.235	.064	.060	-.120	-.123	-.091	.008	.413
48	.217	.405	-.234	.019	.119	.132	-.079	-.052	.001	-.045	.310
49	.338	.349	.359	-.071	.160	.006	-.248	-.017	-.195	.039	.497
50	.393	-.087	-.187	.272	.020	.099	-.215	-.208	-.061	.122	.390
51	.355	.166	-.086	.090	.034	.069	-.091	-.277	.153	-.024	.285
52	.455	.190	-.050	-.066	.132	.173	.096	.098	.048	-.012	.320
53	.341	.385	.170	-.027	.232	-.121	-.097	.176	-.049	-.024	.407
54	.392	.294	.086	-.166	-.114	.111	-.046	-.065	.064	-.220	.360
55	.349	.418	.088	-.066	.040	.028	.089	.007	.019	-.097	.329
56	.262	.046	-.001	-.076	.175	.183	.083	.050	.005	.178	.182
57	.267	.293	.213	-.057	-.151	.077	-.077	-.160	-.029	.091	.276
58	.326	-.010	-.233	-.291	.160	.152	-.096	.015	.002	.181	.337
59	.226	-.026	-.268	-.101	.034	.149	-.012	.082	.029	.117	.180
60	.285	-.030	.075	.050	.117	-.065	-.311	-.025	.376	.039	.349
61	.343	-.109	-.002	.036	.152	-.056	.146	.051	.213	.112	.239
62	.331	.134	-.057	.025	-.244	.135	.282	-.085	.017	-.160	.323
63	.307	.341	.181	-.075	.024	.109	.066	.037	-.011	-.035	.269
64	.360	.350	.178	-.043	.123	.005	-.072	.102	.049	.073	.325
65	.278	.230	-.104	.319	.184	.141	.021	.126	-.114	-.313	.426
66	.217	-.115	.227	.291	.142	-.238	-.226	-.012	.218	.146	.395
67	.363	.037	.049	-.306	.069	.069	.060	.055	.075	.139	.271
68	.282	-.245	-.190	-.187	.112	.104	.014	-.030	.104	.158	.271
69	.297	.207	-.108	.329	.245	.105	-.017	.189	-.097	-.287	.452
70	.310	-.215	.320	.029	.054	.303	-.050	.006	-.114	-.069	.362
71	.326	.011	.127	.222	.157	.032	-.104	-.084	-.175	-.292	.332
72	.339	-.367	.434	.226	.015	-.026	.016	-.117	-.116	.015	.518
73	.374	-.001	-.028	-.194	.089	.099	.289	-.072	-.011	.068	.290
74	.375	-.434	.050	-.059	.307	.123	-.125	-.032	.120	.054	.479
75	.217	-.023	.102	-.053	-.118	-.138	.073	.170	.142	.005	.149
76	.313	-.059	.121	.124	-.186	-.061	-.230	.276	.049	.200	.342
77	.389	.291	.052	-.036	-.170	.126	.071	-.105	-.033	-.048	.305
78	.302	.387	.171	-.097	-.125	-.125	-.345	-.096	.208	-.025	.485
79	.276	-.274	-.006	.124	-.075	-.011	-.334	.202	.097	.200	.375
80	.337	.204	.214	-.213	.206	.068	-.053	.079	-.019	-.007	.304

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Appendix D continued

81	.354	.331	.257	-.273	.215	-.006	-.085	.045	-.126	.043	.450
82	.308	-.103	-.193	-.007	.310	-.067	-.048	-.032	.417	.138	.441
83	.387	-.236	.202	.261	.240	.102	-.062	-.064	-.011	-.087	.399
84	.292	.364	.351	-.090	.270	-.015	-.097	.076	-.092	.036	.449
85	.253	.441	.268	-.047	.304	-.184	-.080	.049	-.070	.052	.476
86	.375	-.172	.095	.253	-.143	.187	-.154	-.070	.097	-.081	.344
87	.383	-.370	.385	.164	-.111	-.010	.151	-.029	-.000	.113	.509
88	.464	-.413	.029	.071	-.107	.223	-.064	-.080	-.080	-.019	.471
89	.364	-.374	.396	.221	-.057	.107	.065	-.037	.066	.076	.509
90	.274	-.004	-.067	-.079	-.171	.124	.234	-.008	.221	-.027	.235
91	.323	.438	.230	-.200	.183	.076	-.097	-.020	-.193	-.044	.479
92	.419	.025	-.059	.005	-.163	-.017	-.203	.175	-.060	.075	.288
93	.321	-.306	-.105	-.047	.212	.075	-.127	-.164	.293	.147	.412
94	.368	.380	.208	-.165	-.090	-.041	-.214	-.164	.110	-.138	.465
95	.432	-.170	.108	.113	-.260	.243	.043	-.026	.080	-.006	.377
96	.408	-.353	.322	.170	.107	.135	-.123	-.137	-.042	.012	.490
97	.256	-.335	.307	.303	-.166	.161	-.061	-.064	.061	.012	.427
98	.250	-.246	.199	.402	-.006	-.047	.046	.040	.203	.245	.431
99	.275	.171	-.154	.216	.160	.110	-.051	.159	.150	-.080	.270
100	.388	-.396	.096	.101	.345	.164	-.065	-.054	.112	-.000	.494
101	.395	.056	-.209	.025	-.032	.268	.045	.197	-.084	.073	.331
102	.270	-.293	.033	.168	.190	.097	-.076	.016	.188	-.042	.277
103	.450	-.369	-.088	-.026	.094	.207	-.111	-.213	.117	-.011	.472
104	.278	.399	.111	.063	-.107	.009	-.068	.210	.168	-.053	.345
105	.418	.084	.225	-.266	.050	.068	.119	-.005	.049	.014	.328
106	.457	-.415	-.072	-.046	.147	.141	-.121	-.100	-.023	.044	.458
107	.344	-.334	-.175	-.142	.071	.150	-.080	-.167	-.041	.090	.354
108	.369	-.025	-.167	.347	-.040	-.014	-.074	-.076	-.015	-.059	.303
109	.332	.355	.444	-.207	.157	-.010	.024	-.089	-.164	.015	.538
110	.380	-.346	.179	.050	.343	.101	-.088	-.089	.039	-.019	.445
111	.361	.243	.233	-.221	.100	.030	.069	.134	.042	.087	.337
112	.380	-.352	.095	.016	.262	.173	-.156	-.089	.189	.007	.446
113	.323	.344	.257	-.153	-.168	-.094	-.238	-.109	.221	-.186	.503
114	.441	-.461	.123	.021	.123	.111	-.223	-.114	.092	-.005	.523
115	.382	-.160	.205	.311	-.177	.038	-.080	-.077	.113	.038	.371
116	.353	-.257	.217	.316	-.278	.056	-.061	.093	.027	.169	.461
117	.381	.015	.189	-.074	-.364	.287	-.034	-.064	.066	-.021	.413
118	.373	-.298	-.162	-.172	.051	.005	-.171	-.005	-.165	.073	.350
119	.259	.389	.044	.004	.073	.039	.122	.136	.159	.080	.293
120	.416	-.158	.031	.269	.233	.019	.085	-.023	-.048	-.127	.353
121	.258	.260	.026	.076	-.226	.044	-.221	.131	.166	.080	.294
122	.265	.277	-.269	.135	-.115	-.019	.031	-.222	-.076	.278	.386

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Appendix D continued

123	.356	-.265	-.180	-.235	-.011	-.096	-.145	-.069	-.129	.178	.369
124	.352	-.217	-.020	-.061	-.067	-.039	-.187	.062	-.015	.156	.245
125	.378	-.337	.311	.130	-.048	-.059	.096	.013	.044	.198	.427
126	.359	.485	-.059	.028	-.066	.028	-.003	-.195	-.048	.054	.418
127	.410	.149	.164	-.330	-.001	.125	-.025	-.113	-.057	.088	.367
128	.395	-.051	.313	.167	.110	.051	.026	-.016	-.063	.025	.306
129	.381	-.211	-.001	-.075	-.023	.031	.004	.043	.021	.018	.200
130	.379	-.145	.051	.105	-.186	-.181	-.190	.294	-.059	.041	.375
131	.427	-.112	-.091	.146	-.162	.187	-.038	.202	-.139	-.089	.356
132	.442	-.071	.050	.169	-.073	.147	-.116	.123	.009	-.020	.288
133	.389	-.208	-.210	.130	-.079	.127	-.183	.176	-.055	.151	.369
134	.369	.252	-.281	.152	-.008	-.102	.030	-.286	-.068	.346	.521
135	.243	.140	-.226	.120	.119	.052	.230	.115	-.018	.165	.255
136	.386	-.165	-.248	-.207	.007	.117	.131	-.091	.097	.118	.345
137	.434	.028	.015	-.182	-.264	.129	-.005	-.080	.204	-.054	.360
138	.378	-.312	.141	.151	-.278	.037	.003	.078	.132	.107	.397
139	.292	.253	-.156	.275	.128	.012	.077	.146	.051	-.120	.311
140	.472	-.235	.075	.205	-.203	-.028	-.132	.150	-.144	.073	.434
141	.465	-.392	.148	.110	.283	.131	.029	-.147	.029	-.072	.531
142	.462	-.263	-.124	.083	.240	.136	-.013	-.099	-.022	-.115	.406
143	.410	.306	.134	-.179	-.053	.207	.096	-.076	.010	-.038	.375
144	.365	.327	.378	-.214	-.091	-.029	-.144	-.113	.095	-.080	.488
145	.270	-.110	.131	.305	-.004	-.127	.124	.194	.152	.108	.301
146	.428	-.302	-.002	-.091	-.133	.085	.010	.040	-.127	.099	.336
147	.407	.129	.251	-.165	.130	.060	.045	-.070	-.140	.088	.329
148	.201	.475	.316	.114	.209	-.155	-.061	.127	-.007	.080	.474
149	.382	-.235	-.111	.060	.006	-.102	.061	.057	.071	.164	.267
150	.177	.103	.089	.076	-.017	-.041	.203	.297	.079	.055	.197
151	.360	-.406	.232	.230	-.163	-.026	.039	.084	.049	.194	.479
152	.417	-.075	-.064	-.080	-.312	.067	.276	-.125	-.012	-.059	.388
153	.388	-.226	-.035	.160	-.140	.169	-.076	.036	-.013	-.113	.298
154	.380	-.048	-.165	-.085	-.007	.176	.161	.095	-.082	.082	.261
155	.514	-.258	.018	.006	-.180	.134	-.097	-.076	-.079	-.029	.404
156	.477	-.193	-.233	-.102	-.036	.016	-.150	.112	-.131	.155	.408
157	.394	-.270	.366	.080	-.027	-.054	.213	.095	-.065	.147	.454
158	.514	-.132	-.185	-.071	.019	.090	.008	.072	-.001	.017	.336
159	.450	.094	-.059	.060	.032	.114	.204	.278	.095	.017	.362
160	.452	.183	-.024	-.102	.138	.037	.116	.212	.091	-.007	.337
161	.486	-.203	-.122	-.041	-.138	-.018	-.209	.207	-.148	.029	.424
162	.419	.212	.224	-.259	-.153	-.028	-.191	-.068	.052	-.124	.423
163	.288	.175	-.184	.257	.118	.158	-.016	.028	-.027	-.103	.265
164	.378	.215	.332	-.214	.053	.067	-.120	.049	-.046	.111	.384

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Appendix D continued

165	.372	.136	.322	-.239	-.016	.133	-.151	-.015	-.032	.157	.386
166	.550	-.176	.052	-.104	-.165	.034	-.042	.001	.111	.125	.406
167	.544	-.019	-.122	.010	-.027	-.090	.106	.078	.137	-.019	.357
168	.436	-.282	-.173	-.119	.154	-.052	-.012	-.074	.221	-.011	.395
169	.427	.174	-.133	-.022	-.109	-.017	.145	.250	.028	-.020	.328
170	.458	.385	-.050	-.011	-.117	-.052	.149	-.163	.097	.047	.438
171	.535	-.122	-.021	.033	-.205	-.076	.072	-.058	.076	-.070	.371
172	.326	.256	-.025	.043	-.190	.121	.126	.097	.238	-.018	.309
173	.525	-.156	-.110	-.073	-.158	-.084	.014	.122	-.100	.052	.378
174	.439	.145	.309	-.250	-.125	.160	-.034	-.061	-.148	.053	.444
175	.473	.258	-.172	-.053	.078	-.127	.048	.122	.007	.079	.370
176	.340	.208	.017	.001	-.212	.079	-.045	.287	.218	.070	.349
177	.401	.267	.007	-.168	-.054	.064	.129	.223	.100	-.008	.344
178	.374	-.324	.292	.096	.233	-.056	.228	-.028	.000	.033	.452
179	.463	.197	.297	-.202	-.104	.167	-.004	.028	-.057	.019	.426
180	.231	.478	-.108	.203	.075	-.171	-.002	-.052	.202	.182	.447
181	.263	.197	.123	.052	.023	-.083	-.328	.072	.402	.022	.409
182	.429	-.031	.081	.007	-.168	-.014	-.081	.029	.044	-.039	.231
183	.358	.309	-.386	.106	-.068	-.069	-.040	-.176	-.197	.242	.525
184	.297	.244	-.212	.350	-.019	-.048	.022	-.218	-.119	.302	.472
185	.456	.145	-.079	-.025	.028	-.170	-.010	-.007	.272	-.089	.349
186	.435	.037	-.060	-.318	.007	.070	.103	.053	-.143	.113	.348
187	.491	-.166	-.042	.014	-.215	-.111	-.110	.167	-.216	.016	.418
188	.423	.193	-.284	.141	.043	-.110	.059	-.211	-.124	.284	.476
189	.389	.202	-.301	-.089	-.089	.013	.100	-.072	-.093	.088	.331
190	.465	-.275	-.169	-.127	-.143	-.117	-.133	.048	-.191	.067	.433
191	.433	-.200	-.221	.048	-.119	.036	-.165	.258	-.101	.077	.406
192	.433	-.275	.220	.159	.191	-.012	-.012	-.062	-.115	-.136	.410
193	.372	.293	-.240	.212	.089	-.163	.059	-.258	-.116	.324	.552
194	.419	.367	.019	.017	-.004	-.026	.085	-.108	-.043	.013	.334
195	.342	.152	-.268	-.016	.202	-.186	.017	-.106	-.080	.313	.405
196	.444	-.088	.163	.095	.082	-.049	.123	-.059	-.155	-.198	.333
197	.292	.554	-.091	.135	.146	.007	-.047	-.052	-.041	-.111	.460
198	.451	-.107	-.285	.031	.137	.037	.031	-.049	-.047	.000	.324
199	.403	-.302	-.021	.071	.077	.110	.031	.006	.022	-.151	.302
200	.204	.494	-.210	.328	.037	.057	.042	.114	-.146	-.165	.506
201	.257	.464	-.042	.199	.138	.113	-.015	.267	.018	-.075	.432
202	.270	.444	-.163	.341	.208	.134	.072	.220	-.013	-.076	.536
203	.515	-.145	.022	.015	-.059	-.014	-.006	.249	-.103	-.067	.368
204	.426	.234	-.167	.084	.007	-.065	.082	-.052	.252	-.050	.352
205	.427	.088	.045	.091	-.278	.143	.122	-.001	.072	-.047	.321
206	.457	.053	.034	.012	-.214	.105	.213	-.019	-.092	-.044	.327

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Appendix D continued

207	.379	.428	.262	.009	.199	-.045	-.061	.107	.010	.100	.464
208	.403	.349	.034	-.046	-.150	.109	.079	-.154	.031	.012	.354
209	.489	.253	.030	-.120	-.067	.028	.104	-.192	.091	.066	.385
210	.449	.247	.304	-.184	-.011	-.013	-.046	-.117	-.144	.092	.435
211	.353	-.131	-.376	-.282	.092	.004	-.019	-.007	-.051	.202	.416
212	.483	.277	.034	-.151	-.048	.035	.234	.129	.129	.054	.429
213	.471	-.027	-.201	.029	-.048	.031	.116	.005	.082	-.060	.291
214	.466	.023	-.083	.081	-.185	.100	.205	.089	.092	-.084	.342
215	.489	-.048	.107	-.154	.152	.078	.139	.075	.032	-.042	.334
216	.485	-.013	-.133	-.222	.083	-.031	.085	.120	-.063	.026	.337
217	.524	.020	-.032	-.163	.113	.051	.141	.138	.008	-.009	.358
218	.321	.201	-.328	.002	.188	.100	.042	.140	-.009	-.044	.320
219	.446	-.034	-.162	-.289	.137	.088	.229	.097	-.003	-.025	.400
220	.393	.310	.263	-.199	.233	.042	-.008	.053	-.158	.016	.444
221	.266	.154	-.129	.097	.048	.067	.025	.130	.009	.078	.151
222	.409	.328	-.290	.109	.070	.110	.011	.097	.058	-.074	.408
223	.346	.412	-.140	.047	-.087	-.054	.031	-.217	.013	-.069	.376
224	.297	.308	-.050	.103	-.114	-.102	.203	-.041	-.003	-.078	.270
225	.501	-.213	-.169	-.021	-.153	-.160	-.174	.179	-.044	-.038	.441
226	.502	-.240	.044	.032	-.089	-.150	.064	.031	.012	-.081	.356
227	.367	-.046	.109	.113	.109	-.178	-.029	-.095	-.078	-.196	.260
228	.289	.323	-.240	.186	-.045	-.176	.063	-.296	-.158	.187	.465
229	.275	.516	-.232	.300	.090	-.070	-.080	-.081	-.157	-.135	.556
230	.349	.143	.082	.146	.268	-.074	.031	-.024	-.186	-.255	.350
231	.279	.493	-.256	.292	.037	-.044	-.039	.083	-.168	-.151	.536
232	.376	.008	-.114	.054	.155	-.024	-.203	.008	-.074	-.173	.259
233	.358	.401	.212	-.009	-.188	-.133	-.162	-.009	.212	-.155	.484
234	.304	.449	-.222	.071	-.114	-.072	.151	-.219	.065	-.032	.444
235	.294	.429	-.266	.287	.157	-.018	-.051	.020	.002	-.140	.472
236	.284	.402	-.245	.162	-.013	-.236	.023	-.185	.113	.143	.454
237	.479	-.244	-.285	-.241	.026	-.105	.055	-.076	.116	-.065	.468
238	.465	-.278	-.176	-.130	-.114	-.200	-.083	-.003	-.051	-.042	.406
239	.396	-.418	-.081	-.120	-.116	-.203	-.080	.053	-.025	.015	.419
240	.465	-.395	-.069	-.138	.135	-.068	-.034	.001	-.104	-.098	.441
241	.384	-.261	-.262	-.028	.011	-.067	-.164	.182	-.083	.019	.358
242	.493	-.043	-.172	.000	-.143	-.024	-.021	.316	-.148	-.130	.436
243	.513	-.413	-.131	-.175	.073	-.142	-.083	-.016	-.070	-.216	.567
244	.431	-.012	-.051	.094	-.085	-.051	.011	.238	-.165	-.140	.311
245	.491	-.371	-.145	-.191	.087	-.145	-.014	-.051	.029	-.081	.476
246	.279	-.215	.265	.086	.186	-.212	.247	.025	-.168	.056	.375
247	.526	-.341	-.001	-.059	-.098	.048	-.015	-.090	-.076	-.065	.427
248	.347	-.341	.365	.245	-.102	-.160	.081	-.085	-.016	.093	.489

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Appendix D continued

249	.174	.417	.315	.111	.194	-.165	.002	.173	-.047	.090	.423
250	.227	.312	.367	-.035	.054	-.072	.132	-.010	.081	-.034	.319
251	.494	-.242	.070	.127	-.152	-.080	.033	-.132	.068	-.156	.402
252	.364	-.384	.283	.177	-.197	-.187	.153	-.043	.076	.141	.517
253	.422	-.346	.240	.234	-.257	-.111	.005	.016	.040	.107	.503
254	.279	-.377	.303	.190	-.065	-.267	.277	-.071	-.046	-.014	.509
255	.436	-.434	-.155	-.188	.117	-.170	.025	-.072	-.023	-.076	.493
256	.559	-.284	-.153	-.063	-.046	-.254	-.086	.021	-.159	-.089	.529
257	.476	-.151	-.338	-.147	-.092	-.186	-.122	.111	-.095	.057	.469
258	.545	-.215	-.174	-.064	-.199	-.304	-.135	.205	-.151	-.060	.597
259	.512	-.236	-.178	-.101	-.159	-.282	-.071	.147	-.162	-.051	.521
260	.484	-.165	-.154	-.030	-.210	-.218	-.183	.243	-.223	-.060	.525
261	.412	.182	-.357	.144	.034	-.107	.045	.034	.068	.098	.382
262	.462	-.404	-.261	-.176	.093	-.072	-.136	-.060	-.004	-.189	.549
263	.485	.023	-.146	-.268	.123	-.159	.004	-.009	.028	.018	.372
264	.333	.383	.112	-.132	.222	-.124	.033	.138	.068	.056	.381
265	.390	-.044	-.239	-.132	-.122	-.005	.253	-.119	.158	-.171	.377
266	.341	.049	-.044	.073	.091	-.127	-.225	.040	.439	-.040	.398
267	.335	.019	-.134	.006	.204	-.097	.044	.110	.123	-.023	.212
268	.416	-.190	-.281	-.326	.088	.010	.024	.050	.037	.092	.415
269	.338	.045	-.185	-.031	-.275	.009	.292	-.141	.175	-.176	.395
270	.432	-.154	-.365	-.211	.098	-.013	.092	.063	.003	-.075	.416
271	.388	.106	.027	.101	-.240	-.098	.204	-.104	.063	-.099	.307
272	.458	-.221	.296	.166	.146	-.199	.083	-.061	-.090	-.181	.488
273	.333	.342	.312	-.109	-.004	-.181	-.078	-.087	.058	-.128	.404
274	.564	-.276	-.002	-.161	-.065	-.171	-.029	-.138	-.076	-.264	.549
275	.483	-.278	.225	.035	-.137	-.216	.112	-.062	.028	-.021	.447
276	.511	-.250	.005	-.045	-.058	-.085	-.012	-.075	.007	-.256	.408
277	.285	.304	.137	-.120	-.100	-.207	-.302	-.087	.183	-.122	.408
278	.446	.181	-.127	.181	.016	-.020	.000	-.225	.129	-.097	.360
279	.353	.304	.400	-.140	-.005	-.201	-.018	-.053	-.145	-.022	.462
280	.362	-.084	-.409	.100	.164	.019	.033	-.000	.029	-.201	.387
281	.326	-.177	-.343	-.081	-.105	.097	.206	-.002	.101	-.041	.338
282	.315	-.110	.143	.281	.112	-.307	-.048	-.010	.260	.048	.391
283	.404	-.433	-.113	-.144	.297	-.126	-.038	-.088	-.044	-.160	.527
284	.423	-.233	-.102	.071	-.150	-.311	-.167	.265	-.185	-.109	.514
285	.370	-.429	-.130	-.135	.135	-.189	.045	-.068	.044	-.111	.432
286	.459	.058	.268	-.206	-.222	.015	-.002	-.110	-.074	-.142	.416
287	.523	-.158	.120	-.054	-.211	-.151	.013	-.052	.003	-.197	.426
288	.413	.053	.184	-.135	-.293	-.058	.004	-.094	.067	-.139	.348
289	.303	.497	.047	.106	-.196	-.126	-.033	.164	.106	-.060	.450
290	.410	.352	.212	-.057	-.233	-.027	.105	.031	.025	-.061	.412

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Appendix D continued

291	.333	.324	-.277	.244	-.149	-.075	.001	-.273	-.072	.293	.547
292	.376	.292	-.315	.155	-.035	-.194	.031	-.200	-.152	.209	.497
293	.373	-.156	-.299	-.127	.264	-.160	.022	-.110	.281	.033	.457
294	.482	.172	-.111	.191	-.066	-.195	.036	-.282	-.080	.142	.462
295	.489	-.278	.185	.087	.131	-.192	.110	-.126	-.076	-.118	.461
296	.346	-.319	-.282	-.266	.114	-.080	-.015	-.184	.123	-.034	.443
297	.343	.252	-.380	-.067	-.068	-.149	.150	.094	-.050	.020	.392
298	.392	-.210	-.335	-.217	.105	-.119	.149	-.043	.079	-.064	.418
299	.372	-.071	-.221	-.282	.196	-.074	.049	.001	.046	-.007	.321
300	.291	.408	-.018	-.183	.118	.054	.085	-.008	-.040	.000	.311
301	.319	.437	.171	-.016	-.127	-.085	-.168	-.099	.215	-.107	.442
302	.385	.074	.033	-.177	.082	-.124	.168	.036	.072	-.175	.274
303	.314	-.188	.227	.015	.068	-.184	.298	.005	-.048	.001	.316
304	.370	.074	-.022	-.210	.139	-.090	.197	.041	.003	-.185	.290
305	.373	-.190	-.119	-.320	.158	-.065	-.054	-.139	-.002	-.146	.366
306	.294	.080	-.169	-.180	.234	-.176	-.155	.026	.080	.038	.273
307	.161	.459	.138	-.043	-.013	-.143	-.009	.218	.027	.043	.329
308	.371	-.042	-.061	.142	.198	-.013	.087	.012	-.030	.006	.212
309	.274	.174	.012	-.078	.024	-.272	.079	.114	.038	.124	.223
310	.131	-.038	.018	.028	-.032	.068	-.002	-.042	-.080	-.041	.035
311	.095	-.007	.014	.060	-.057	.063	.058	-.015	-.041	-.060	.029
312	.262	.113	-.229	.173	-.034	-.122	-.061	-.112	.014	-.043	.198
313	.163	.107	.097	.062	.018	.067	.097	.034	-.005	.106	.078
314	.196	.319	.318	.140	.068	-.094	.075	.121	.009	.080	.302
315	.298	-.172	-.137	-.255	-.053	.043	.267	-.000	-.002	.012	.279
316	.370	-.284	.090	-.041	-.037	-.109	.256	-.071	-.125	-.009	.328
317	.223	.285	-.277	.332	-.018	-.022	.036	.006	.000	-.047	.323
318	.338	.286	-.057	-.055	-.177	.111	.107	-.087	.074	-.090	.280
319	.278	.067	-.052	-.019	-.014	.011	.174	.092	.062	.061	.132
320	.212	.428	.257	-.027	.062	-.169	.091	.108	-.017	.024	.349
321	.163	.187	.310	.377	.041	-.021	.093	.046	-.002	-.016	.314
322	.239	.009	.365	.185	-.018	-.059	.123	.073	.040	.119	.265
323	.236	-.066	-.263	.157	.004	.007	.166	.071	.042	-.087	.197
<i>V<sub>p</sub></i>	44.1	22.4	13.15	9.08	6.76	5.55	5.28	4.83	4.46	4.28	119.89 121.03
%	13.7	6.9	4.1	2.8	2.1	1.7	1.6	1.5	1.4	1.3	



## APPENDIX E

### PREFERENCE OF SOCIAL ECONOMIC STATUS OF 84 OCCUPATIONS BY 410 CHINESE HIGH SCHOOL STUDENTS

Pref. Occupational Titles

	N+	N-
1. Manager	272	61
2. Commercial artist	252	89
3. Lawyer	242	92
4. Interior designer	242	91
5. Costume designer	238	100
6. Judge	229	109
7. Government official	224	93
8. Radio and television announcer	223	107
9. Psychologist	221	104
10. Actor/actress	219	117
11. Airplane pilot	217	107
12. Photographer	213	101
13. Newspaper reporter	205	115
14. Hotel manager	201	131
15. Economist	197	118
16. Corporation lawyer	193	130
17. Interpreter	189	125
18. College teacher	189	126
19. Criminal lawyer	174	157
20. Sociologist	171	140
21. Musician	167	153
22. Architect	162	147
23. Singer	162	154
24. Industrial designer	160	142
25. Public relations worker	157	146
26. Computer programmer	156	144
27. Flight attendant	156	169
28. Physicist	155	164
29. Computer technician	153	150
30. Police officer	150	163
31. Bank clerk	144	163
32. Chemist	142	170
33. Mathematician	136	158
34. Mechanical engineer	133	168
35. Conductor	133	164
36. Farmer	132	180
37. Secretary	129	188
38. Self employed	129	184
39. Food Scientist	128	178
40. Biochemist	128	175
41. Accountant	124	177
42. Historian	123	193

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## Appendix E continued

43. Chef	119	195
44. Dancer	119	192
45. Secondary school teacher	117	191
46. Librarian	116	190
47. Dietitian	116	199
48. Craft person	112	181
49. Geologist	109	191
50. Political scientist	105	227
51. Surgeon	101	223
52. Geographer	98	213
53. Chemical engineer	98	202
54. Electrical engineer	95	207
55. Pharmacist	92	207
56. Elementary school teacher	92	230
57. Taxicab driver	89	236
58. Meteorologist	84	222
59. Purchasing agent	84	228
60. Sales worker	82	236
61. Physician	80	247
62. Barber/hair dresser	80	252
63. Veterinarian	79	264
64. Optometrist	76	264
65. Medical laboratory worker	73	254
66. Agricultural engineer	70	235
67. Electrician	67	260
68. Farmer	66	255
69. Civil engineer	66	242
70. Soil scientist	65	249
71. Machinery repairer	63	269
72. Shoe repairer	59	266
73. Telephone operator	59	248
74. Postman	59	275
75. Waiter/waitress	57	275
76. Automobile mechanic	56	268
77. Nurse	54	290
78. Physical therapist	54	259
79. Radiology technologist	52	282
80. Appliance repairer	50	284
81. Dentist	50	283
82. Farm equipment mechanic	47	290
83. Carpenter	45	292
84. Bus driver	35	302

## APPENDIX F

### ROTATED FACTOR LOADINGS BY USING OBLIQUE METHOD



Variables	Rotated Factor Loadings									
	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10
1	.10046	-.05400	-.05177	<b>.38323</b>	-.10885	.07706	-.09166	-.12969	-.11339	.33201
2	.00853	<b>.44183</b>	.03999	-.07132	-.03911	<b>.34034</b>	-.00849	-.18004	-.03310	.04518
3	-.09545	-.07605	.02039	.05842	.08040	.28317	.22253	.25994	-.04239	-.03755
4	-.04887	.02452	-.13352	.15021	-.08238	.06938	-.00511	-.02695	.11456	<b>.40945</b>
5	.03289	-.14294	-.03626	.18352	.07954	.04364	-.17513	<b>.34639</b>	.04375	.03818
6	-.11495	.20841	<b>.54329</b>	.05024	.01368	-.06939	-.01280	.04818	-.27558	-.01427
7	-.10921	<b>.30739</b>	-.00662	.05975	.00101	.08612	.14626	-.03784	.10431	.20582
8	-.08308	.10035	<b>.54826</b>	.00175	.12796	-.00822	.02548	.06441	-.02504	-.08867
9	-.00692	.06895	<b>.34321</b>	.07858	.44035	.10376	-.15895	.06252	.01542	-.16465
10	.04443	<b>.50403</b>	.15823	-.03152	.00138	-.12964	-.25984	-.04528	.12253	.12685
11	<b>.50180</b>	.01388	-.01957	.04194	-.03451	.19153	-.13318	.08277	.04280	.02899
12	.15304	.21813	-.16964	-.01715	.15884	.11901	-.00008	.18381	-.02876	.16502
13	-.01804	.21048	-.15467	<b>.39822</b>	-.15696	.07653	-.08027	-.06491	.01578	<b>.26292</b>
14	.02709	<b>.45299</b>	.01599	.07994	-.14061	.09013	.02902	-.07810	-.05244	.04814
15	-.03921	.07199	.27642	<b>.33988</b>	.12450	.12492	.00940	-.23387	-.07007	.08448
16	.02816	<b>.35378</b>	.12336	.08246	-.01838	.06662	.08173	.09289	-.07239	.00391
17	.13188	.12746	-.22080	-.03736	<b>.29485</b>	.17061	-.08972	.16893	-.00211	.10235
18	.26326	.05954	-.02739	-.06261	-.04557	<b>.38393</b>	.02312	-.09118	.04307	.11015
19	<b>.28690</b>	-.04916	.23698	.09417	-.07400	.28739	-.11403	.03260	-.07266	.10835
20	.05602	<b>.46533</b>	-.06585	-.02264	.07025	.00560	-.14200	.04023	.16327	.08620
21	.16753	.11293	.08290	.11488	-.00065	.19009	.09076	.11626	-.03453	-.06218
22	.01516	-.15504	.03127	<b>.42659</b>	-.06408	.02074	.02739	.08640	-.00518	.09381
23	-.08035	.00280	<b>.56904</b>	.01249	-.04684	.20874	.01991	.00527	.04612	.07602
24	-.08642	-.03547	.04478	<b>.26463</b>	.10687	.15469	.00662	-.03008	.14449	.24139
25	.11411	.11224	-.15837	<b>.26797</b>	.19241	.26032	-.30176	.03753	.04746	.09771
26	.07046	.08052	.03488	-.02032	.16946	.25201	.07345	.15659	-.15930	.15098
27	-.04180	.23780	.02216	.08032	.20447	<b>.29009</b>	.08555	.00742	-.00186	-.05818
28	-.04350	-.06367	<b>.42577</b>	-.00978	.09626	-.01161	-.05294	.18872	.06190	-.03513
29	.02650	-.17494	-.04195	<b>.41555</b>	.00953	.11648	-.08409	-.01388	.03419	<b>.31931</b>
30	-.02258	.21353	-.04847	.03797	-.04479	.01193	.06426	-.05656	<b>.47263</b>	.00421
31	.00169	-.02829	-.15362	<b>.25705</b>	-.10668	.17220	.07215	.02010	.18176	.14297
32	.02344	.04873	-.09876	.03616	-.10528	.15585	-.04674	-.05509	.07181	<b>.58117</b>
33	.00315	.08345	-.15115	<b>.47129</b>	-.08575	.01293	-.03870	.07263	.03104	.29048
34	.10227	-.07189	.18192	.18397	.14415	<b>.40062</b>	.00115	-.08175	-.07918	-.03105
35	.01166	.27227	<b>.61453</b>	-.02621	-.00641	-.06991	-.02321	.02701	-.19878	-.05839
36	-.02707	.21299	.00666	-.04703	.05202	<b>.43322</b>	.01755	.03651	.10810	-.17213
37	-.03426	.23735	-.03683	.03331	.05881	<b>.29901</b>	.09598	.12448	.04251	.03876
38	.12962	-.05524	.12798	.07955	.18580	.23117	-.16256	-.04393	.02706	<b>.29245</b>
39	-.05818	.02062	<b>.53633</b>	.17734	.19832	.03889	-.18011	-.05440	.05725	-.05887
40	-.00902	.00450	.07366	.12549	-.03825	.09328	.14217	<b>.27758</b>	.04075	.01100

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Appendix F continued

41 -.04980-.15743 .12304 **.36882** .13937 .28931-.03826 .11007-.00595 .02092  
 42 .04993 **.37096**-.08188-.11317-.02548 **.45428** .04102-.09197 .06683-.09073  
 43 .05016 **.50421**-.14497 .00700-.18593 .03112 .02480 .12795-.03081 .22871  
 44 -.03114 **.32744**-.05966-.15373 .00981 .19099 .23653 .17039-.11287 .16112  
 45 -.01441 .22355 **.44909**-.02355 .04061 .02100 .15083 .01728-.20585-.00004  
 46 -.01726-.13992-.08451 .17119 .23864 .21583-.02150 **.35766** .00927 .03187  
 47 -.00798 **.54747**-.08198-.00086 .06513 .14350 .01636-.10800 .09443 .11787  
 48 -.08433 .14567-.27823 .25830 .09321 .06389 .01513 .07567 .07605 .22507  
 49 .06951 **.64558** .03434 .10482-.03155 .06781-.23114-.08111 .07542 .06506  
 50 .13039-.11674 .11168 .15559 .17827 .20651-.22650-.06299 .05381 .38503  
 51 -.14285 .01226 .00432 .11972 .20523 .14577 .04389-.10162 .24888 **.29110**  
 52 .01161 .23279-.02242 .18111 .16904 .11571 .19202 .19999 .02580 .04097  
 53 .09574 **.50334**-.00443 .20110 .00591-.17705-.05527 .11228 .12398 .00206  
 54 .02305 **.26904**-.16357 .13242 .00162 .19408 .25914-.11908 .23135-.02259  
 55 -.07194 **.34578**-.05245 .16819-.03552 .01407 .22644 .03619 .11473 .08371  
 56 -.05463 .19821 .06722-.00540 .19464 .12963 .01860 .22713-.09525 .08062  
 57 -.04353 **.30340** .03199-.08220-.13156 .22417 .01396-.08579 .13698 .21196  
 58 .13238 .17842-.20852-.10059 **.37847** .14087-.02090 .16672-.05196 .12468  
 59 .13148-.03078-.14769-.00754 .19383 .12250 .04091 .20359-.04570 .09653  
 60 .01206 .01791 .08446-.01683 **.29225** .00844-.16280 .05485 **.50062**-.01646  
 61 -.01816-.00710 **.26254**-.02563 .25808-.07642 .13915 .19446 .10465 .05800  
 62 -.03015-.05656 .03350 .13061-.11851 .19559 **.45648**-.05062 .00310 .11397  
 63 -.06511 **.37285** .00346 .11163-.06215 .10864 .15260 .06751 .06643 .02165  
 64 .01159 **.42324** .03008 .07749 .01182 .00261-.01446 .15574 .17349 .06299  
 65 .02248 .06112-.03197 **.64397**-.02015-.00076 .05330 .04413-.02606-.03980  
 66 .04361 .00535 **.40586**-.01193 .11774-.15615-.29542 .03170 **.35076** .08125  
 67 .06490 **.28904**-.00423-.17502 .22144 .09555 .15770 .15254 .02763 .01140  
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 69 .06946 .07928-.01711 **.65215** .02091-.05645-.00323 .09872-.00696-.06742  
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 71 .07182 .15859 .13508 **.45061** .06768 .04049-.05862-.24171 .00836-.03878  
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 75 .17219 .03561 .12711-.09606-.06286-.08332 .18504 .10627 .16508-.09448  
 76 **.42367** .05077 .16809-.08236-.17017 .06956-.18586 .21287 .21253-.00142  
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 78 .06023 **.29875**-.13575-.06014-.04268 .04445-.06024-.11426 **.52891** .11310  
 79 **.41688**-.09635 .13470-.07735 .06788 .10459-.30308 .17702 .21190-.02205  
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 81 .04360 **.65991**-.05024 .01251 .09879-.00626-.02750 .01862 .01479 .00587  
 82 -.10898-.09895 .08791-.04057 **.54467**-.12048 .00402 .22198 .30539 .11086

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83 .00385 .06878 **.38798** .29293 .24822 .11574-.12166-.07142 .03721-.05571  
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85 -.05405 **.59699** .06204 .10850 .02260-.23244-.11875 .04385 .09872 .09561  
86 .11481-.13467 .21766 .17773 .03006 **.32637**-.03794-.07188 .22223 .00268  
87 .11591 .01405 **.62569**-.11003-.02313 .15163 .07696-.03987-.00911-.01249  
88 **.26360**-.09543 .23276 .06735 .17645 .37341 .01368-.10649-.04688-.00261  
89 .04054-.01347 **.60103**-.02288 .03803 .24731-.00153-.01780 .06361-.07624  
90 -.05197-.11557 .04583-.05796 .05461 .16669 **.40034** .10704 .11431 .01976  
91 -.01817 **.65148**-.12118 .14452 .02139 .06915-.02657-.05473-.01061 .04579  
92 **.44655** .09861-.03721 .02315-.07165 .09903-.06129 .09500 .11883 .08113  
93 -.05614-.11093 .13676-.11198 **.55975** .12130-.07682 .05843 .20878 .09229  
94 -.00473 **.37972**-.12657 .02102-.00107 .10862 .08670-.20899 **.39449** .07312  
95 .12482-.09764 .23938 .03238-.03550 **.39804** .17234 .01346 .11012 .01194  
96 .06829 .10236 **.45080** .09393 .21677 .26117-.17023-.14689 .03726-.04074  
97 .06644-.14599 **.46312** .04792-.05715 .32244-.08228-.07432 .12551-.06147  
98 .00293-.18743 **.58648**-.03896 .00290 .02778-.11457 .19327 .16472 .12030  
99 .00432-.01985-.03109 **.35684** .11038 .00457 .00392 .23360 .17234 .00792  
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107 .15115-.04667 .01379-.07862 **.41027** .23297-.02245-.07163 -.09063 .12417  
108 .15668-.18246 .13939 .28816 .02481 .04786-.02984-.05146 .10118 .24823  
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115 .10411-.11031 **.40333** .05638-.06214 .21477-.03788-.05045 .23829 .09893  
116 .28311-.13488 **.45354**-.04083-.20089 .24444-.08915 .08833 .12076 .06018  
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118 **.40142** .06623-.04410-.05663 .29672 .09383-.09581-.06402 -.11370 .06725  
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120 .03743 .00774 **.32559** **.35748** .21694-.01805 .03735-.03068 -.04582 .02756  
121 .17300 .06370-.07638 .00286-.18660 .15103-.05013 .16091 **.35338** .08327  
122-.00559-.02804-.01339-.05326-.05523 .06718-.00512 .04528 -.02941 **.63171**  
123 **.38940** .05966-.03765-.22431 .27874 .03785-.06744-.07363 -.08334 .19196  
124 **.36607** .03826 .08268-.13482 .12686 .09211-.11524 .03771 .07236 .06557

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125 .14144 .02861 **.56816**-.16038 .04290 .08079 .00944 .04739 .02705 .03167  
 126-.07745 .24748-.09281 .09590-.07811 .10029 .09871-.04239 .10411 **.42797**  
 127 .03519 **.44002**-.03884-.15012 .14236 .23313 .11208-.05125 .01808 .09563  
 128 .02053 .23582 **.39650** .13998 .04254 .10401-.03982-.01344 .00760 .01909  
 129 .22465 .02557 .12033-.03091 .17199 .10611 .10144 .02468 .02357-.02296  
 130 **.57992** .02444 .14350 .01813-.15689-.05246-.08968 .08518 .13631-.05288  
 131 **.39655**-.05012 .03971 .26041-.08910 .23974 .06638 .08936 -.05561-.04370  
 132 **.25119** .02458 .14679 .19262 .00011 .22184-.02653 .09048 .12001-.01943  
 133 **.42723**-.12230 .03300 .07612 .07677 .19392-.15251 .19432 -.00355 .10034  
 134-.01608 .01063 .07520-.07280 .06872-.01083-.04445 .03473 -.02396 **.74332**  
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 136 .06702-.06376-.02013-.13819 **.35347** .15861 .24153 .09014 -.04184 .16988  
 137 .09462 .02747-.04321-.10624 .06891 **.29438** .30523-.03713 .27271 .02796  
 138 .26695-.17401 **.36621**-.11378-.06683 .21823 .07686 .07540 .16501-.00875  
 139 .01175-.00409 .02026 **.41405**-.00877-.10096 .10411 .18510 .08280 .09173  
 140 **.50660**-.01868 .27768 .06615-.12824 .13738-.09456 .01806 .02093 .05900  
 141-.02738 .04104 .40283 .18623 **.45317** .15439 .00197-.10145 -.01855-.05836  
 142 .08122-.02823 .13837 .27474 **.42909** .12308 .02982-.06372 -.04762 .03083  
 143-.08693 **.35325**-.04376 .04438 .01600 .26123 .26421 .00685 .06781 .07826  
 144-.01786 **.47809** .00142-.07170-.04061 .12919 .10586-.16898 **.34432**-.01084  
 145 .10656-.09701 **.43720** .05875-.07189-.11559 .04289 .22818 .12928 .01422  
 146 **.35906** .02768 .15359-.09942 .09350 .21803 .07404 .00388 -.11925 .03744  
 147 .00505 **.47810** .14831-.02551 .11180 .11195 .04652-.02947 -.07934 .09530  
 148-.07475 **.49769** .14973 .14229-.14128-.20255-.13517 .13952 .16324 .08184  
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 153 .26057-.14237 .12203 .19756 .03856 **.26457** .04846-.03268 .06219-.04296  
 154 .16576 .05090 .00506 .04092 .11713 .16456 .19599 .17947 -.17821 .09341  
 155 **.32108**-.01146 .14004 .03255 .09817 .31879 .06055-.13271 .03208 .05858  
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 159 .12551 .07588 .11186 .18078 .02958 .04458 .26228 **.34600** .02036-.02340  
 160 .09456 **.25570** .00106 .13172 .14275-.03237 .22449 .25615 .07032-.02835  
 161 **.61161** .04343-.02345 .04003 .03656 .10506-.05841 .04469 .00616 .00123  
 162 .16563 .37736-.10284-.05669-.00097 .14841 .12733-.18692 **.30960**-.03268  
 163 .00030-.01880-.03074 **.41268** .05912 .08109 .00282 .09712 .01688 .13529  
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 165 .08227 **.48594** .05628-.16690 .04433 .26352-.06324 .01752 .10367 .01499  
 166 **.27595** .05276 .17366-.16822 .13966 .21524 .13018 .04493 .16836 .08334

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167 .21329-.01047 .11742 .07142 .15094-.04403 **.27216** .10855 .15137 .10801  
 168 .11151-.08824 .07686-.03253 **.50146**-.01530 .14131 .00588 .16066 .03341  
 169 .26189 .07871-.03501 .11531-.08210-.02525 **.29495** .22993 .04727 .04707  
 170-.07291 .15804 .02636 .00573-.02881 .03628 **.30770** .00484 .17553 **.38663**  
 171 .24652-.07228 .18675 .01469 .04854 .08484 **.28008**-.09156 .15801 .12200  
 172-.02397-.00722-.00004 .06712-.10889 .15135 **.30833** .20749 .24732 .06123  
 173 **.47693** .03520 .07816-.03818 .03596 .03825 .15409 .03698 -.02832 .10429  
 174 .12203 **.47979** .05221-.10619-.04808 **.31700** .09841-.08806 -.00331 .03698  
 175 .20074 .21070-.05272 .08166 .08935-.14352 .14687 .18440 .06476 .23080  
 176 .20600 .06717-.03435-.00390-.15790 .13034 .14029 **.31619** .29611-.04032  
 177 .11754 .25181-.07637 .03832-.02713 .04897 **.30672** .24402 .11072-.03772  
 178-.02760 .12322 **.56191** .03598 .24735-.04812 .10118-.00776 -.09785-.05668  
 179 .10131 **.45415** .05487-.03630-.05701 .28301 .14925 .00957 .07014-.02140  
 180-.15428 .08488 .03682 .06159-.02938-.18669-.00636 .19175 .28211 **.43283**  
 181 .02270 .10502-.00055 .00353 .10145-.01113-.12833 .12274 **.59490**-.03208  
 182 .25539 .06770 .10306 .02020-.01833 .12774 .09945-.04043 .18772 .02123  
 183 .15982 .03483-.12696 .03617-.02250 .00378-.04850 .02234 -.09049 **.67089**  
 184-.02388-.04736 .16835 .07416-.07018 .01571-.12866 .06080 -.05484 **.68160**  
 185 .07069 .05043 .01279 .07277 .19196-.12581 .22864 .02907 **.36069** .09865  
 186 .22217 **.30633**-.06915-.11144 .14804 .10994 .19727 .08566 -.16508 .10350  
 187 **.60878** .05931 .08593 .02890-.10191 .04575 .01458-.03017 -.03751 .06543  
 188 .06446 .04015 .08830 .00196 .09969-.04940-.01470 .04291 -.08885 **.65878**  
 189 .14472 .06062-.14754 .01138 .04868 .05729 .20960 .04849 -.07729 **.37374**  
 190 **.57399** .01338 .00023-.09123 .11174 .04370 .00326-.08266 -.07343 .12722  
 191 **.56409**-.07245-.02433 .08045 .03299 .10806-.06764 .16925 -.01579 .03176  
 192 .12860 .13238 **.38299** .24383 .21423 .03468-.03269-.17264 -.03816-.07022  
 193-.03470 .07673 .13456 .01027 .06213-.11367-.07222 .03905 -.06395 **.74057**  
 194-.02910 **.27206** .03413 .11293-.03401 .01961 .17077-.01626 .06631 **.30393**  
 195 .08214 .14420 .02190-.08019 .23664-.18823-.07297 .11760 -.08698 **.51848**  
 196 .11756 .17061 **.27949** .25496 .07564-.00693 .16823-.18719 -.07467-.00850  
 197-.10333 .27354-.15658 **.37366**-.02833-.05804 .03011 .01640 .12254 .25888  
 198 .16627-.04177 .01448 .17025 **.31452** .02963 .08657 .03134 -.07394 .20453  
 199 .14948-.07610 .18159 .20440 **.26014** .13255 .11887-.04196 .00425-.10744  
 200 .02175 .06803-.14552 **.53108**-.23425-.05993 .05854 .11199 -.02235 .20924  
 201 .00612 .22445-.09612 **.41828**-.12019-.02613 .01231 .29553 .10678 .01413  
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 203 **.45501** .10988 .13232 .15009 .00663 .04191 .11149 .08178 -.01242-.10192  
 204-.04611-.03033 .01216 .14156 .13260-.05387 **.26086** .08919 **.28620** .22733  
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 206 .13681 .07725 .14063 .07422-.11450 .20392 **.33020**-.01811 -.06320 .12983  
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 208-.07291 .20927-.01979 .02894-.06653 .20907 .23962-.02612 .12758 **.27140**

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209-.07062 .22738 .05109-.06455 .09611 .13779 **.26564**-.02678 .14871 **.29745**  
 210 .07210 **.53673** .10498-.08934-.01602 .12663 .03445-.11483 .03781 .17276  
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 212 .02998 .25873 .04398-.01792 .00683 .04160 **.38396** .23378 .10260 .08436  
 213 .14760-.08507 .03935 .12954 .15128 .06460 **.27361** .06089 .06931 .13193  
 214 .14013-.08442 .11096 .14404-.04231 .14769 **.37072** .11736 .07615 .05463  
 215 .07322 **.26451** .14577 .07088 .25178 .06767 .23222 .08618 -.00879-.08965  
 216 **.27770** .20941-.04072 .00838 .22028-.03029 .20539 .10917 -.07691 .05305  
 217 .16731 .23701 .04730 .07979 .21579 .02945 .25560 .15742 -.02843-.01357  
 218 .08799 .07076-.20364 **.28769** .18965-.03049 .11015 .22186 -.04283 .10785  
 219 .11898 .17593-.06379 .02758 .31443 .02859 **.35248** .14627 -.13685-.02024  
 220 .01784 **.63618** .02090 .09612 .08704 .01953 .01517 .03465 -.04806 .00389  
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 222 .06456 .04771-.17573 **.34119** .07592 .03438 .14519 .19844 .10665 .18492  
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 225 **.60607**-.05192-.00470 .03812 .06628-.02890 .03682-.00269 .11592 .01442  
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 227 .12834 .12879 .19899 .22884 .11029-.12257 .04717-.23267 .07340 .03333  
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 231 .12560 .09657-.18123 **.49841**-.19178-.12174 .01647 .05421 .01894 .28117  
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 233 .06147 .24743-.03773 .06727-.16521 .00627 .14472-.09004 **.50192** .02540  
 234-.13243 .01472-.10369 .11374-.06319-.03093 **.29818**-.05012 .13746 **.45508**  
 235-.01588 .04286-.14037 **.48156** .01051-.12148 .01163 .08475 .13053 .25994  
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 237 .24398-.08593-.05480-.06820 **.42820**-.03793 .29386-.06517 .07391 .08173  
 238 **.48054**-.05582 .01464-.06724 .19048-.05084 .12208-.14005 .05099 .08332  
 239 **.49715**-.08948 .12469-.15145 .18202-.04723 .06766-.09684 .03814-.01165  
 240 **.35412** .05534 .11038 .05772 **.37861**-.01097 .07377-.13113 -.08602-.07432  
 241 **.51216**-.07031-.05512 .06884 .19588-.02559-.06174 .07517 -.02040 .01128  
 242 **.56596** .03906-.07259 .22190-.07520 .01004 .16715 .10593 -.03112-.06837  
 243 **.44347** .00021 .02871 .08642 **.39629**-.05139 .14241-.22843 .00598-.10647  
 244 **.43126** .07482 .04923 .25950-.10949-.02507 .12442 .04138 -.04131-.04431  
 245 **.32384**-.01949 .07308-.03635 **.43268**-.06035 .16645-.13103 .03369-.00586  
 246 .08558 .19190 **.50139** .01410 .06852-.20911 .07216-.03857 -.21555 .01630  
 247 **.31603**-.01133 .17284 .01164 .20696 .20744 .13855-.16673 -.01656 .02664  
 248 .14184-.01942 **.63633**-.08549-.05197 .02276-.00065-.13179 .04777 .06804  
 249-.03958 **.47267** .18454 .12483-.17363-.22462-.10336 .16432 .08468 .05204  
 250-.17782 **.38537** .19936 .02054-.09048-.05581 .17419 .00214 .15678-.01106

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251 .19526-.11840 **.29493** .08980 .09124 .08894 .21194-.21325 .17213 .05218  
 252 .18365-.11948 **.61538**-.20385-.05037 .01274 .12057-.05592 .08222 .07877  
 253 **.31078**-.12496 **.52098**-.10384-.10989 .10983 .02581-.04289 .13575 .06151  
 254 .11148-.07050 **.63398**-.06199-.03873-.14505 .19127-.17300 -.06740 .01416  
 255 **.31506**-.04473 .10313-.04677 **.44661**-.09887 .15827-.16141 -.05066-.00178  
 256 **.56276** .01334 .07684 .05058 .18707-.11657 .09000-.18000 -.01208 .09213  
 257 **.57214**-.02525-.13329-.05262 .16431-.08442 .06260 .01921 .00273 .17266  
 258 **.74559**-.00305 .00157 .01198-.00411-.14631 .09047-.06887 .05066 .04312  
 259 **.66428** .00069 .01316-.01467 .04854-.14039 .12588-.08983 -.01262 .06108  
 260 **.75065** .03241-.04596 .06792-.08464-.07634 .01155-.04732 .00063 .01588  
 261 .14866-.07985-.02995 .14262 .10345-.12329 .10705 .18451 .08809 **.37309**  
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 265 .02897-.15754-.04183 .02949 .19737 .04250 **.50932**-.06836 .08237 .09869  
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 268 .26756 .04964-.12924-.13539 **.41022** .02714 .17134 .11307 -.05231 .06104  
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 271 .05166-.04443 .18240 .05519-.13456 .02348 **.36446**-.10223 .13524 .19196  
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 275 .24398 .02196 **.43681**-.09783 .04037-.03061 .21113-.16163 .10439 .03680  
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 277 .10780 **.25362**-.13950-.02407-.00547-.05458 .00460-.18275 **.49190** .04707  
 278-.07216-.03302 .06630 .22750 .14680 .04070 .14921-.10068 .23423 **.31195**  
 279 .08712 **.56426** .14461-.03705-.13639-.08303 .06783-.17825 .08870 .07397  
 280 .13856-.18981-.10622 **.35598** **.32617**-.05973 .15954 .01091 -.00053 .08728  
 281 .13069-.25618-.05286 .01231 .20838 .11052 **.36247** .08531 -.04041 .08893  
 282 .04198-.06857 **.42650** .03765 .13352-.24358-.05359 .02194 **.34202** .09526  
 283 .23089 .02403 .09929 .10161 **.55507**-.11844 .05543-.19771 -.06083-.08537  
 284 **.72393**-.02975 .06289 .12103-.08374-.19510-.01613-.06662 .03271-.04714  
 285 .24127-.09542 .13543-.02029 **.43596**-.14026 .16855-.15353 .00128-.04326  
 286 .17728 **.30986** .06842-.04715-.06115 .21202 .25112-.24898 .11238-.02096  
 287 **.32602** .04956 .17688 .02270 .01863 .04142 .27786-.24336 .16831-.02698  
 288 .16725 .13610 .06751-.07543-.08842 .14506 **.29324**-.20404 .23983 .00569  
 289 .13040 .18072-.06620 .14605-.31926-.07784 .15703 .12123 .32061 .11729  
 290 .07654 .29499 .06299 .01908-.24745 .08764 .30414-.00860 **.18346** .08183  
 291 .00899-.05851 .04373-.01711-.09920 .04738-**.03536** .01075 .03140 **.74806**  
 292 .11629 .02860 .00098 .03922-.01892-.11976 .00971-.01908 -.04842 **.66994**

Continued, next page

Appendix F continued

293 .00642-.09848 .00540-.04317 **.57575**-.18302 .14725 .05255 .18291 .15564  
 294 .07529 .04169 .19903 .02770 .01123-.04902 .05400-.13516 .05783 **.58921**  
 295 .14443 .10276 **.43062** .11610 .22169-.10431 .13137-.22879 -.01923 .03251  
 296 .13610-.10914-.07296-.12032 **.54105**-.02020 .17057-.13178 .05623 .08556  
 297 .23466 .01346-.19482 .07146-.01109-.17029 **.28118** .13398 -.03931 **.29581**  
 298 .17906-.09623-.06164-.02208 **.42344**-.12400 .31651-.01283 -.02855 .08667  
 299 .14317 .12328-.11446-.03050 **.41608**-.10249 .18614 .03925 -.01339 .05223  
 300-.07828 **.38324**-.15763 .08427 .06480 .00694 .17446 .07819 -.00429 .14453  
 301-.04805 .25271-.06835 .05278-.09416 .03844 .10196-.09728 **.47585** .11010  
 302 .06489 .20248 .03030 .07883 .16348-.13192 **.35051**-.03352 .08310-.06691  
 303 .05771 .12132 **.43703**-.03511 .06043-.15051 .24015-.04257 -.11117-.00689  
 304 .06292 .22701-.02121 .11647 .20282-.13636 **.35354**-.02713 -.01681-.06480  
 305 .16071 .13428-.11079-.01325 **.45779**-.01832 .15434-.20616 .02215-.02910  
 306 .15166 .18802-.15045-.00379 **.33726**-.19690-.04190 .05157 .14507 .09739  
 307 .07376 **.35753**-.06038 .03172-.23106-.16408 .05518 .18198 .16378 .03103  
 308 .05551 .05315 .19521 .20587 .19521-.05536 .04453 .07239 -.05244 .12316  
 309 .15413 .20190 .07791-.10296-.01555-.25277 .11759.12465 .08565 .14999  
 310 .05570 .02353 .03970 .07049 .00143 .10465 .01972-.06657 -.04606 .02375  
 311 .01507-.01993 .05199 .08605-.04868 .08036 .07976-.03251 -.03272 .00767  
 312 .10226-.11236-.02769 .16199 .03813-.07409 .02916-.07414 .12597 **.29317**  
 313-.05146 .12509 .14489 .01748-.04908 .06368 .03926 .12587 -.02503 .08810  
 314-.06694 **.33653** .25411 .08181-.20063-.10762 .00055 .14177 .10017 .05250  
 315 .11455-.00965 .01438-.13087 .19163 .06668 **.37114** .04051 -.15270 .02253  
 316 .16719 .03090 **.33572**-.06122 .09538-.01892 .25946-.12653 -.17741 .06048  
 317 .02368-.13623-.03531 **.33609**-.10362-.06602 .05708 .09495 .07113 **.30996**  
 318-.03649 .08464-.09764 .07996-.06075 .17652 **.31840**-.01371 .13522 .15909  
 319 .04839 .04524 .07804 .00632 .02834-.00049 .21323 .17143 .00168 .07971  
 320-.03347 **.43535** .09447 .04350-.18138-.18467 .10286 .08651 .09797 .06332  
 321-.12377 .12824 **.38385** .24654-.23079-.03041-.02775 .05770 .08139 .04919  
 322-.01496 .16045 **.45177**-.01902-.14710-.00159 .02494 .09816 .06941 .01523  
 323 .09500-.22479 .04298 .21405 .07927-.04551 .20950 .10422 -.03425 .07862



APPENDIX G

INTERCORRELATIONS OF SUBSCALE ITEMS

# INTERCORRELATIONS OF SUBSCALE ITEMS

REPOR	22	77	31	208	209	194	
223	1.000	.3532	.2407	.4202	.4415	.3659	
77	.3532	1.000	.3438	.4626	.3043	.2954	
31	.2407	.3438	1.000	.2872	.1731	.1168	
208	.4202	.4626	.2872	1.000	.5553	.4398	
209	.4415	.3043	.1731	.5553	1.000	.4596	
194	.3659	.2954	.1168	.4398	.4596	1.000	
INTER	224	205	206				
224	1.000	.1680	.4100				
205	.1680	1.000	.3859				
206	.4100	.385	1.000				
SINGE	228	32	195	193	122		
228	1.000	.4294	.3844	.3885	.4708		
32	.4294	1.000	.3201	.3868	.4544		
195	.3844	.3201	1.000	.4010	.3059		
193	.3885	.3868	.4010	1.000	.4062		
122	.4708	.4544	.3059	.4062	1.000		
CARTI	229	197	13	22	221	1	33
229	1.000	.5923	.4610	.3040	.3433	.3344	.4283
197	.5923	1.000	.4884	.2129	.3084	.2534	.4163
13	.4610	.4884	1.000	.2819	.1570	.3154	.4289
22	.3040	.2129	.2819	1.000	.1000	.2703	.3218
221	.3433	.3084	.1570	.1009	1.000	.2405	.2422
1	.3344	.2534	.3154	.2703	.2405	1.000	.3204
33	.4283	.4163	.4289	.3218	.2422	.3204	1.000
DESIG	230	48	201				
230	1.000	.1484	.1823				
48	.1484	1.000	.2842				
201	.1823	.2842	1.000				

Continued, next page

Appendix G continued

CDSIG	231	200	198	
231	1.000	.6645	.1534	
200	.6645	1.000	.1194	
198	.1534	.1194	1.000	
ANCER	234	223	126	170
234	1.000	.4289	.3394	.5206
223	.4289	1.000	.5238	.4002
126	.3394	.5238	1.000	.4904
170	.5206	.4002	.4904	1.000
IDSIG	235	202		
235	1.000	.5844		
202	.5844	1.000		
ACTOR	236	4	180	189
236	1.000	.3951	.6397	.3266
4	.3951	1.000	.4148	.2658
180	.6397	.4148	1.000	.2284
189	.3266	.2658	.2284	1.000
PHOTO	278	24	204	51
278	1.000	.4133	.4591	.4433
24	.4133	1.000	.3392	.4657
204	.4591	.3392	1.000	.4336
51	.4433	.4657	.4336	1.000
MUSIC	291	188	184	134
291	1.000	.4439	.5533	.4713
188	.4439	1.000	.4641	.5312
184	.5533	.4641	1.000	.5197
134	.4713	.5312	.5197	1.000

Continued, next page

Appendix G continued

DANCE            292    183

292                1.000 .6783  
183                .6783 1.000

ART            REPO INTE SING CAR DES CDSI ANCE IDSI ACT PHO MUS DAN

REPOR	1.000	.4913	.4701	.5151	.4173	.3909	.7296	.3433	.5091	.4986	.4066	.3423
INTER	.4913	1.000	.3043	.3164	.2614	.3134	.4436	.2355	.2929	.3191	.3134	.2042
SINGE.	.4701	.3043	1.000	.4832	.3118	.4397	.5106	.3767	.5891	.4265	.8042	.5986
CART	.5151	.3164	.4832	1.000	.6351	.6429	.4910	.6005	.4968	.3968	.4185	.4144
DESIG	.4173	.2614	.3118	.6351	1.000	.5242	.4302	.5719	.3704	.3416	.2782	.3032
CDSIG	.3909	.3134	.4397	.6429	.5242	1.000	.4383	.6117	.4309	.3505	.4340	.4946
ANCER	.7296	.4436	.5106	.4910	.4302	.4383	1.000	.3893	.5822	.4888	.4739	.4420
IDSIG	.3433	.2355	.3767	.6005	.5719	.6117	.3893	1.000	.3848	.4207	.4000	.3605
ACTOR	.5091	.2929	.5891	.4968	.3704	.4309	.5822	.3848	1.000	.3632	.5644	.5120
PHOTO	.4986	.3191	.4265	.3968	.3416	.3505	.4888	.4207	.3632	1.000	.4269	.2977
MUSIC	.4066	.3134	.8042	.4185	.2782	.4340	.4739	.4000	.5644	.4269	1.000	.6433
DANCE	.3423	.2042	.5986	.4144	.3032	.4946	.4420	.3605	.5120	.2977	.6433	1.000

METEO            226    132    166    167

226                1.000 .2155 .4154 .3491  
132                .2155 1.000 .3304 .3337  
166                .4154 .3304 1.000 .4965  
167                .3491 .3337 .4965 1.000

ARCHI            227    15

227                1.000 .2947  
15                .2947 1.000

FSCIE            244    131

244                1.000 .4287  
131                .4287 1.000

SSCIE            247    88

247                1.000 .5156  
88                .5156 1.000

Continued, next page



Appendix G continued

PHYSI	248	97	89	95
248	1.000	.4156	.5251	.2958
97	.4156	1.000	.4842	.3153
89	.5251	.4842	1.000	.3099
95	.2958	.3153	.3099	1.000
GEOLO	251	115	155	
251	1.000	.3366	.3987	
115	.3366	1.000	.2958	
155	.3987	.2958	1.000	
CHEMI	252	151		
252	1.000	.4541		
151	.4541	1.000		
BIOCH	253	116	23	108
253	1.000	.5248	.3591	.1734
116	.5248	1.000	.3506	.2204
23	.3591	.3506	1.000	.1281
108	.1734	.2204	.1281	1.000
MATHE	254	87	8	157
254	1.000	.5870	.4909	.5354
87	.5870	1.000	.5927	.5931
8	.4909	.5927	1.000	.4979
157	.5354	.5931	.4979	1.000
LIBRA	281	3		
281	1.000	.3022		
3	.3022	1.000		
GEOGR	287	86	182	
287	1.000	.2200	.5133	
86	.2200	1.000	.2267	
182	.5133	.2267	1.000	

Continued, next page

Appendix G continued

SCI	MET	ARC	FSCI	SSCI	PHYS	GEOL	CHE	BIO	MAT	LIBR	GEOG
METEO	1.000	.3254	.4247	.4600	.4404	.5688	.4185	.4421	.3299	.2672	.5564
ARCHI	.3254	1.000	.1949	.2548	.3136	.3629	.2518	.3273	.2929	.1002	.3361
FSCIE	.4247	.1949	1.000	.3860	.3286	.3450	.2285	.3440	.1991	.1915	.3528
SSCIE	.4600	.2548	.3860	1.000	.5256	.5922	.4582	.4794	.3895	.2334	.5004
PHYSI	.4404	.3136	.3286	.5256	1.000	.5953	.6568	.6633	.5987	.1331	.4663
GEOLO	.5688	.3629	.3450	.5922	.5953	1.000	.4835	.5953	.3959	.1903	.6353
CHEMI	.4185	.2518	.2285	.4582	.6568	.4835	1.000	.6779	.5860	.1213	.4191
BIOCH	.4421	.3273	.3440	.4794	.6633	.5953	.6779	1.000	.5035	.1580	.4679
MATHE	.3299	.2929	.1991	.3895	.5987	.3959	.5860	.5035	1.000	.0545	.2710
LIBRA	.2672	.1002	.1915	.2334	.1331	.1903	.1213	.1580	.0545	1.000	.1935
GEOGR	.5564	.3361	.3528	.5004	.4663	.6353	.4191	.4679	.2710	.1935	1.000
MREPA	240	102	110								
240	1.000	.2325	.3304								
102	.2325	1.000	.3965								
110	.3304	.3965	1.000								
AREPA	243	100	9								
243	1.000	.3424	.2808								
100	.3424	1.000	.5561								
9	.2808	.5561	1.000								
COMTE	246	178	35								
246	1.000	.5021	.5087								
178	.5021	1.000	.5137								
35	.5087	.5137	1.000								
MENGI	272	96	215	27	114	72					
272	1.000	.4551	.2638	.1884	.3549	.4197					
96	.4551	1.000	.2634	.2565	.4628	.4462					
215	.2638	.2634	1.000	.3353	.2335	.2471					
27	.1884	.2565	.3353	1.000	.1850	.1696					
114	.3549	.4628	.2335	.1850	1.000	.3610					
72	.4197	.4462	.2471	.1696	.3610	1.000					

Continued, next page

# Appendix G continued

AENGI	274	106	27	70	
274	1.000	.3676	.1909	.1953	
106	.3676	1.000	.1718	.2464	
27	.1909	.1718	1.000	.2207	
70	.1953	.2464	.2207	1.000	
CENGI	275	128	27	70	
275	1.000	.2492	.1368	.1898	
128	.2492	1.000	.1188	.3046	
27	.1368	.1188	1.000	.2207	
70	.1898	.3046	.2207	1.000	
CIVEN	276	192	27	71	196
276	1.000	.3280	.1643	.2020	.3181
192	.3280	1.000	.1828	.3183	.4634
27	.1643	.1828	1.000	.1012	.0890
71	.2020	.3183	.1012	1.000	.4588
196	.3181	.4634	.0890	.4588	1.000
AUTOM	283	112	74	103	
283	1.000	.3819	.4631	.2995	
112	.3819	1.000	.4938	.3583	
74	.4631	.4938	1.000	.3966	
103	.2995	.3583	.3966	1.000	
ELECT	285	141			
285	1.000	.3064			
141	.3064	1.000			
ELENG	295	39	215	83	120
295	1.000	.3148	.3145	.3188	.3699
39	.3148	1.000	.1643	.4321	.2860
215	.3145	.1643	1.000	.2155	.2290
83	.3188	.4321	.2155	1.000	.4600
120	.3699	.2860	.2290	.4600	1.000

Continued, next page

Appendix G continued

CPRGM      303   45      6      35

303	1.000	.3684	.4210	.5030
45	.3684	1.000	.4129	.4632
6	.4210	.4129	1.000	.6799
35	.5030	.4632	.6799	1.000

TECH      MRE ARE   COM   MEN AEN CEN   CIVE AUT   ELE   ELE   CPR

MREPA	1.000	.7270	.4091	.5812	.5079	.4463	.4159	.6952	.5730	.5277	.3337
AREPA	.7270	1.000	.4091	.6162	.5698	.4750	.4901	.7409	.6357	.5802	.3377
COMTE	.4091	.4091	1.000	.4936	.3340	.4086	.3512	.3154	.4254	.5230	.8450
MENGI	.5812	.6162	.4936	1.000	.7487	.7297	.6776	.6102	.5623	.7388	.4019
AENGI	.5079	.5698	.3340	.7487	1.000	.7821	.6445	.5953	.5115	.5274	.2973
CENGI	.4463	.4750	.4086	.7297	.7821	1.000	.6245	.4352	.4361	.5461	.3938
CIVEN	.4159	.4901	.3512	.6776	.6445	.6245	1.000	.4562	.4629	.5867	.3147
AUTOM	.6952	.7409	.3154	.6102	.5953	.4352	.4562	1.000	.7056	.5537	.2134
ELECT	.5730	.6357	.4254	.5623	.5115	.4361	.4629	.7056	1.000	.5731	.3292
ELENG	.5277	.5802	.5230	.7388	.5274	.5461	.5867	.5537	.5731	1.000	.4506
CPRGM	.3337	.3377	.8450	.4019	.2973	.3938	.3147	.2134	.3292	.4506	1.000

MANAG      249    7      10      49    217    111    91      81      14

249	1.000	.1900	.3798	.3965	.1103	.2443	.3291	.3031	.3048
7	.1900	1.000	.1924	.2510	.1620	.2208	.3445	.3028	.2206
10	.3798	.1924	1.000	.4531	.0845	.1138	.2869	.2807	.1867
49	.3965	.2510	.4531	1.000	.1422	.2323	.4556	.4538	.2883
217	.1103	.1620	.0845	.1422	1.000	.2713	.1982	.2958	.1950
111	.2443	.2208	.1138	.2323	.2713	1.000	.3752	.3764	.2827
91	.3291	.3445	.2869	.4556	.1982	.3752	1.000	.5576	.3900
81	.3031	.3028	.2807	.4538	.2958	.3764	.5576	1.000	.3020
14	.3048	.2206	.1867	.2883	.1950	.2827	.3900	.3020	1.000

HMANA      264    53    160    148    14    81

264	1.000	.4330	.2549	.3986	.2683	.3956
53	.4330	1.000	.2873	.4074	.2569	.3587
160	.2549	.2873	1.000	.1785	.1453	.2366
148	.3986	.4074	.1785	1.000	.2042	.3158
14	.2683	.2569	.1453	.2042	1.000	.3020
81	.3956	.3587	.2366	.3158	.3020	1.000

Continued, next page



Appendix G continued

ACCOU	302	186	105	16	47
302	1.000	.2413	.3034	.1889	.2345
186	.2413	1.000	.2355	.1851	.2392
105	.3034	.2355	1.000	.2200	.2564
16	.1889	.1851	.2200	1.000	.2620
47	.2345	.2392	.2564	.2620	1.000

PURCH	299	56	20
299	1.000	.1456	.1537
56	.1456	1.000	.0854
20	.1537	.0854	1.000

PRWORK	300	85	12	55
300	1.000	.2103	.2432	.3357
85	.2103	1.000	.1059	.3277
12	.2432	.1059	1.000	.1702
55	.3357	.3277	.1702	1.000

CLERK	304	67
304	1.000	.3064
67	.3064	1.000

BUSI	MAN	HMA	ACC	PUR	PRW	CLE
MANAG	1.000	.8392	.5892	.4364	.6294	.3008
HMANA	.8392	1.000	.5447	.3841	.6216	.3206
ACCOU	.5892	.5447	1.000	.4289	.4606	.5175
PURCH	.4364	.3841	.4289	1.000	.4683	.3656
PRWORK	.6294	.6216	.4606	.4683	1.000	.3333
CLERK	.3008	.3206	.5175	.3656	.3333	1.000

Continued, next page

Appendix G continued

OFFICIAL	42	43	57	80	127	210	250	144
42	1.000	.3004	.2218	.1763	.2363	.3017	.1609	.2483
43	.3004	1.000	.3528	.2392	.2423	.3226	.2326	.2962
57	.2218	.3528	1.000	.1831	.2202	.2816	.2705	.3903
80	.1763	.2392	.1831	1.000	.3222	.2960	.1778	.3104
127	.2363	.2423	.2202	.3222	1.000	.3858	.2065	.3837
210	.3017	.3226	.2816	.2960	.3858	1.000	.3630	.3903
250	.1609	.2326	.2705	.1778	.2065	.3630	1.000	.3734
144	.2483	.2962	.3903	.3104	.3837	.3903	.3734	1.000

ETEACHER	265	62	214
265	1.000	.4007	.3336
62	.4007	1.000	.3054
214	.3336	.3054	1.000

STEACHER	269	75	171
269	1.000	.0962	.3153
75	.0962	1.000	.2179
171	.3153	.2179	1.000

CTEACHER	271	90	18	152
271	1.000	.1459	.1766	.3526
90	.1459	1.000	.1349	.3741
18	.1766	.1349	1.000	.1967
152	.3526	.3741	.1967	1.000

TEACH	ETEA	STEA	CTEA
ETEACHER	1.000	.5371	.6139
STEACHER	.5371	1.000	.5193
CTEACHER	.6139	.5193	1.000

Continued, next page

Appendix G continued

JUDGE	233	30	144	162	94	119
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233	1.000	.4768	.5047	.3948	.4854	.1702
30	.4768	1.000	.3705	.3181	.3456	.1567
144	.5047	.3705	1.000	.5467	.4836	.1519
162	.3948	.3181	.5467	1.000	.5331	.0769
94	.4854	.3456	.4836	.5331	1.000	.1360
119	.1702	.1567	.1519	.0769	.1360	1.000

POLICE	266	60	181	185
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266	1.000	.5128	.4738	.3929
60	.5128	1.000	.4872	.3297
181	.4738	.4872	1.000	.3339
185	.3929	.3297	.3339	1.000

COLAWYER	273	113	220	207
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273	1.000	.4290	.2646	.3114
113	.4290	1.000	.2977	.2905
220	.2646	.2977	1.000	.4096
207	.3114	.2905	.4096	1.000

CRLAWYER	277	78	162	94
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277	1.000	.5334	.3758	.3857
78	.5334	1.000	.3966	.5284
162	.3758	.3966	1.000	.5331
94	.3857	.5284	.5331	1.000

LAWYER	301	54	162	94
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301	1.000	.3557	.3647	.5473
54	.3557	1.000	.4178	.4916
162	.3647	.4178	1.000	.5331
94	.5473	.4916	.5331	1.000

Continued, next page

Appendix G continued

LEGAL	JUDG	POLI	COL	CRL	LAW			
JUDGE	1.000	.4410	.7472	.8358	.8526			
POLICE	.4410	1.000	.3529	.4181	.3527			
COLAWYER	.7472	.3529	1.000	.7217	.7128			
CRLAWYER	.8358	.4181	.7217	1.000	.8565			
LAWYER	.8526	.3527	.7128	.8565	1.000			
PHARM	225	161	203					
225	1.000	.4702	.4645					
161	.4702	1.000	.4255					
203	.4645	.4255	1.000					
RADIOL	238	149						
238	1.000	.3437						
149	.3437	1.000						
MLWORKER	239	146	28	98	145	138	140	
239	1.000	.3543	.2034	.1691	.1174	.2577	.3397	
146	.3543	1.000	.1732	.1294	.2247	.3749	.3690	
28	.2034	.1732	1.000	.4726	.2564	.1835	.1726	
98	.1691	.1294	.4726	1.000	.3268	.3575	.2200	
145	.1174	.2247	.2564	.3268	1.000	.3613	.2209	
138	.2577	.3749	.1835	.3575	.3613	1.000	.3439	
140	.3397	.3690	.1726	.2200	.2209	.3439	1.000	
VETER	241	79	191	133				
241	1.000	.2921	.5841	.4793				
79	.2921	1.000	.3646	.3803				
191	.5841	.3646	1.000	.5982				
133	.4793	.3803	.5982	1.000				
DIETI	242	101	159	169				
242	1.000	.3790	.3909	.3858				
101	.3790	1.000	.3465	.3242				
159	.3909	.3465	1.000	.4761				
169	.3858	.3242	.4761	1.000				

Continued, next page



Appendix G continued

PHYTHER	256	213	158			
256	1.000	.2945	.3426			
213	.2945	1.000	.5079			
158	.3426	.5079	1.000			
NURSE	257	190	173	156	150	
257	1.000	.3597	.3420	.4978	.0629	
190	.3597	1.000	.3714	.4117	.0170	
173	.3420	.3714	1.000	.3150	.0791	
156	.4978	.4117	.3150	1.000	.1055	
150	.0629	.0170	.0791	.1055	1.000	
OPTOME	258	124	129			
258	1.000	.3554	.2940			
124	.3554	1.000	.3554			
129	.2940	.3554	1.000			
DENTIST	259	118	123			
259	1.000	.3590	.2986			
118	.3590	1.000	.5024			
123	.2986	.5024	1.000			
PHYSICN	260	92	173	187	76	11
260	1.000	.3757	.3991	.4919	.3097	.3695
92	.3757	1.000	.3510	.4126	.2277	.3200
173	.3991	.3510	1.000	.4431	.2263	.2634
187	.4919	.4126	.4431	1.000	.2698	.3620
76	.3097	.2277	.2263	.2698	1.000	.2315
11	.3695	.3200	.2634	.3620	.2315	1.000
SURGEON	284	130				
284	1.000	.4378				
130	.4378	1.000				

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Appendix G continued

MED	PHA	RADI	MLW	VETE	DIET	PHY	NURS	OPT	DEN	PHY	SURG
PHARM	1.000	.4787	.4854	.4636	.4132	.4870	.5935	.5443	.4912	.6811	.5392
RADIOL	.4787	1.000	.4513	.3955	.2382	.4261	.5335	.4179	.5083	.4350	.4125
MLWORK	.4854	.4513	1.000	.3832	.2578	.3578	.4755	.4397	.4081	.5047	.4233
VETER	.4636	.3955	.3832	1.000	.3982	.4463	.5028	.4279	.4286	.5291	.4561
DIETI	.4132	.2382	.2578	.3982	1.000	.5372	.4391	.3671	.3791	.4247	.3552
PHYTHER	.4870	.4261	.3578	.4463	.5372	1.000	.5963	.4542	.5316	.4689	.3743
NURSE	.5935	.5335	.4755	.5028	.4391	.5963	1.000	.5769	.5921	.7005	.5398
OPTOME	.5443	.4179	.4397	.4279	.3671	.4542	.5769	1.000	.6293	.5646	.4888
DENTIST	.4912	.5083	.4081	.4286	.3791	.5316	.5921	.6293	1.000	.5148	.4324
PHYSICN	.6811	.4350	.5047	.5291	.4247	.4689	.7005	.5646	.5148	1.000	.6418
SURGEON	.5392	.4125	.4233	.4561	.3552	.3743	.5398	.4888	.4324	.6418	1.000
ECOMST	279	84	165	109							
279	1.000	.3865	.3778	.5120							
84	.3865	1.000	.3572	.4264							
165	.3778	.3572	1.000	.3438							
109	.5120	.4264	.3438	1.000							
POLISCI	286	174	2	164							
286	1.000	.4682	.2867	.3202							
174	.4682	1.000	.3465	.4457							
2	.2867	.3465	1.000	.3344							
164	.3202	.4457	.3344	1.000							
HISTO	288	137	117	172							
288	1.000	.5166	.4155	.2076							
137	.5166	1.000	.4922	.2987							
117	.4155	.4922	1.000	.2774							
172	.2076	.2987	.2774	1.000							

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Appendix G continued

PSYGIST	289	121	173	104	212	176
289	1.000	.3963	.1052	.5375	.2844	.4369
121	.3963	1.000	.1186	.4078	.2794	.4439
173	.1052	.1186	1.000	.1288	.1974	.1911
104	.5375	.4078	.1288	1.000	.2545	.4162
212	.2844	.2794	.1974	.2545	1.000	.3149
176	.4369	.4439	.1911	.4162	.3149	1.000
SOCGIST	290	179	177	37	143	36
290	1.000	.4255	.3594	.2345	.3497	.1581
179	.4255	1.000	.3678	.2373	.4255	.2102
177	.3594	.3678	1.000	.4082	.3988	.2139
37	.2345	.2373	.4082	1.000	.2774	.4625
143	.3497	.4255	.3988	.2774	1.000	.2152
36	.1581	.2102	.2139	.4625	.2152	1.000
SOCIAL	ECO	POLI	HIST	PSYG	SOCG	
ECOMST	1.000	.6860	.2955	.3443	.5114	
POLISCI	.6860	1.000	.5065	.3923	.5992	
HISTO	.2955	.5065	1.000	.4133	.4952	
PSYGIST	.3443	.3923	.4133	1.000	.6387	
SOCGIST	.5114	.5992	.4952	.6387	1.000	
POST	237	136				
237	1.000	.3575				
136	.3575	1.000				
SHOE	255	107				
255	1.000	.3141				
107	.3141	1.000				
FLIGHT	261	175				
261	1.000	.4149				
175	.4149	1.000				

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Appendix G continued

CARPEN	262	142	65		
262	1.000	.3702	.0485		
142	.3702	1.000	.1974		
65	.0485	.1974	1.000		
SALES	263	26	52	216	64
263	1.000	.1944	.3138	.2979	.2495
26	.1944	1.000	.2495	.2072	.1141
52	.3138	.2495	1.000	.2385	.2909
216	.2979	.2072	.2385	1.000	.1994
64	.2495	.1141	.2909	.1994	1.000
CHEF	267	139	99		
267	1.000	.2273	.3207		
139	.2273	1.000	.5164		
99	.3207	.5164	1.000		
WAITE	268	58	211		
268	1.000	.4226	.5259		
58	.4226	1.000	.5286		
211	.5259	.5286	1.000		
BARB	270	17	59	218	
270	1.000	.2839	.4013	.4132	
17	.2839	1.000	.3230	.2722	
59	.4013	.3230	1.000	.2757	
218	.4132	.2722	.2757	1.000	
PILOT	282	66			
282	1.000	.6271			
66	.6271	1.000			
TAXI	293	82			
293	1.000	.5112			
82	.5112	1.000			

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Appendix G continued

CONDU	294	68	147					
294	1.000	.0070	.1480					
68	.0070	1.000	.0568					
147	.1480	.0568	1.000					
BUS	296	168						
296	1.000	.5039						
168	.5039	1.000						
SECRE	297	135	154	21	44	219	73	
297	1.000	.2873	.2580	.0934	.2877	.2298	.2398	
135	.2873	1.000	.2437	.1529	.2341	.1264	.2187	
154	.2580	.2437	1.000	.1794	.2725	.2818	.3062	
21	.0934	.1529	.1794	1.000	.1954	.2571	.0398	
44	.2877	.2341	.2725	.1954	1.000	.2570	.3289	
219	.2298	.1264	.2818	.2571	.2570	1.000	.2918	
73	.2398	.2187	.3062	.0398	.3289	.2918	1.000	
TELE	298	61						
298	1.000	.2983						
61	.2983	1.000						
CRAFT	280	163	29					
280	1.000	.2904	.2728					
163	.2904	1.000	.4028					
29	.2728	.4028	1.000					

Continued, next page

Appendix G continued

SERVICE POS SHO FLI CA SAL CHE WA BA PIL TA CON BUS SEC TEL CRA

POST	1.00	.451	.307	.403	.429	.113	.531	.337	.064	.421	.397	.471	.463	.483	.272
SHOE	.451	1.00	.131	.419	.314	.092	.405	.334	.064	.374	.399	.499	.272	.389	.224
FLIGHT	.307	.131	1.00	.305	.448	.330	.395	.365	.197	.248	.335	.168	.458	.243	.281
CARPE	.403	.419	.305	1.00	.398	.327	.300	.362	.103	.312	.299	.376	.326	.323	.459
SALES	.429	.314	.448	.398	1.00	.285	.438	.332	.038	.274	.419	.270	.548	.310	.222
CHEF	.113	.092	.330	.327	.285	1.00	.176	.258	.129	.302	.159	.191	.221	.207	.365
WAITE	.531	.405	.395	.300	.438	.176	1.00	.487	-.058	.369	.327	.438	.413	.366	.189
BARB	.337	.334	.365	.362	.332	.258	.487	1.00	-.018	.313	.340	.320	.392	.288	.299
PILOT	.064	.064	.197	.103	.038	.129	-.058	-.018	1.00	.234	.188	.167	.004	.170	.122
TAXI	.421	.374	.248	.312	.274	.302	.369	.313	.234	1.00	.256	.575	.276	.437	.251
CONDU	.397	.399	.335	.299	.419	.159	.327	.340	.188	.256	1.00	.315	.432	.354	.256
BUS	.471	.499	.168	.376	.270	.191	.438	.320	.167	.575	.315	1.00	.254	.429	.178
SECRE	.463	.272	.458	.326	.548	.221	.413	.392	.004	.276	.432	.254	1.00	.477	.332
TELE	.483	.389	.243	.323	.310	.207	.366	.288	.170	.437	.354	.429	.477	1.00	.215
CRAFT	.272	.224	.281	.459	.222	.365	.189	.299	.122	.251	.256	.178	.332	.215	1.00

SELF                    306      81      186      64      12

306	1.000	.2173	.1985	.1929	.1900
81	.2173	1.000	.1948	.3419	.1975
186	.1985	.1948	1.000	.1955	.1875
64	.1929	.3419	.1955	1.000	.2146
12	.1900	.1975	.1875	.2146	1.000

FARMER                232      40      25      153      41      199      46      34      5

232	1.000	-.0202	.4611	.2574	.1302	.2417	.1637	.1360	.0920
40	-.0202	1.000	-.0036	.0639	.1762	.0648	.2045	.0218	.1601
25	.4611	-.0036	1.000	.2184	.2640	.1519	.2590	.1522	.1312
153	.2574	.0639	.2184	1.000	.3145	.4262	.1947	.2768	.1027
41	.1302	.1762	.2640	.3145	1.000	.2197	.3335	.2791	.2493
199	.2417	.0648	.1519	.4262	.2197	1.000	.1704	.3136	.0227
46	.1637	.2045	.2590	.1947	.3335	.1704	1.000	.1430	.2559
34	.1360	.0218	.1522	.2768	.2791	.3136	.1430	1.000	.0283
5	.0920	.1601	.1312	.1027	.2493	.0227	.2559	.0283	1.000

Continued, next page

Appendix G continued

MECHANIC    245    103    106

245	1.000	.3245	.4028
103	.3245	1.000	.5025
106	.4028	.5025	1.000

FARM            FARM    MECHA

FARMER	1.000	.4476
MECHANIC	.4476	1.000

SCALES   ART   SCI   TEC   BUS   OFF   TEA   LEG   MED   SOC   SER   FAR

ART	1.000	.3583	.2053	.5228	.4257	.3491	.4362	.4070	.4991	.5814	.2830
SCI	.3583	1.000	.7475	.2451	.2262	.4964	.2459	.6861	.4182	.4705	.5555
TECH	.2053	.7475	1.000	.3305	.2614	.3590	.2380	.6014	.3388	.5421	.5972
BUSI	.5228	.2451	.3305	1.000	.7161	.2845	.6367	.3083	.7051	.4819	.2134
OFFIC	.4257	.2262	.2614	.7161	1.000	.2953	.6562	.2085	.7298	.2810	.0989
TEACH	.3491	.4964	.3590	.2845	.2953	1.000	.3350	.5057	.4400	.4878	.3541
LEGAL	.4362	.2459	.2380	.6367	.6562	.3350	1.000	.2877	.6690	.3324	.1235
MED	.4070	.6861	.6014	.3083	.2085	.5057	.2877	1.000	.3909	.6598	.6014
SOCIA	.4991	.4182	.3388	.7051	.7298	.4400	.6690	.3909	1.000	.3993	.2073
SERVI	.5814	.4705	.5421	.4819	.2810	.4878	.3324	.6598	.3993	1.000	.6017
FARM	.2830	.5555	.5972	.2134	.0989	.3541	.1235	.6014	.2073	.6017	1.000

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