

**A Psychometric Evaluation of the Chinese Translation of CLUES®:**

**Revised and Updated April 2007**

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As the People's Republic of China joins the globalization of business and industry, it has begun to adopt Western business practices, albeit slowly. One of the more rapidly growing Western practices is pre-employment screening by means of standardized and validated psychological tests, tests that measure job-related personality characteristics and cognitive ability. This trend raises the question of whether such measures, initially developed using Western samples and based on Western concepts and ideology, can be used appropriately in the People's Republic of China.

The purposes of this research report are to: (1) establish the psychometric properties of the Chinese version of **Clues**; (2) compare these properties to those of the original English Language version that has been standardized on a large sample of American job applicants; and (3) develop appropriate data for Chinese job applicants for use in our computer-based scoring protocols.

**Clues**® is a brief pre-employment screening instrument that consists of seven relatively independent measures of personality (the Personality Test) plus a brief, 30-item, timed measure of cognitive ability (the Cognitive Ability Test). The original English-language version of the Personality Test was designed to assess seven basic concepts. Five were based on the five personality traits—the so-called Big Five—that are widely considered to be the most basic in understanding personality in a wide variety of settings (John & Srivastava, 1999; Lanyon & Goodstein, 1997; Tupes & Cristal, 1961). These five traits are as follows: (1) *conscientious/organized vs. careless/unsystematic*; (2)

*tough-minded/assertive vs. agreeable/likeable*; (3) *conventional/rule-bound vs. free-wheeling/non-conforming*; (4) *extroverted vs. introverted*; and, (5) *stable/resilient vs. anxious/apprehensive*. The remaining two concepts were selected because of their fundamental importance in organizational settings: *teamwork*, the attitudes and behaviors that are necessary for successful team membership; and *good impression*, the identification of persons who are extreme in their attempts to make a good impression by routinely giving answers that deny the presence of any problems whatever, even those that most people easily acknowledge.

Although there has been considerable research into the differences between Chinese and American samples on measures of the Big Five, most of it has addressed differences in the factorial structure of personality between the two cultures (Cheung, Leung, Zhang, Sun, Gan, Song, & Xie, 2001; DeRaad & Peabody, 2005; Hamid, 1994; Liu, Friedman, & Chi, 2002; Rolland, 2002; Yang & Bond, 1990; Zhang, Lee, Liu, & McCauley, 1999). While these studies are of considerable theoretical interest, they are of little help in appreciating how score differences between individuals in the two cultures impact the practical utility of a given instrument—in this instance, **Clues®**.

Two studies, however, do suggest differences in five-factor scores that may be of practical importance. Zhang, Lee, Liu, and McCauley (1999) reported that Americans were significantly more assertive and somewhat less extroverted and conscientious than the Chinese. In a study of the relationship between Big Five factor scores and adjustment of Chinese students studying in Pacific Rim countries, Ward, Leong, & Low (2004) reported that neuroticism (named *anxious/apprehensive* in **Clues®**), extroversion, agreeableness (*agreeable/likeable* in **Clues®**), and conscientiousness were all related to the

psychological and socio-cultural adaptation of these Chinese students studying abroad. While these data do not deal directly with the question of American-Chinese differences, they do provide empirical evidence of the usefulness of the Big Five in predicting an important set of behaviors outside the American context and give us an empirical justification for developing the Chinese language version of **Clues®**.

### **Developing Clues®**

The original English-language version of the Personality Test was developed over several years (Goodstein & Lanyon, 2005) with close adherence to state-of-the-art principles and procedures for the construction of personality test scales (see Lanyon & Goodstein, 1997). Each scale contains ten items to be rated in a 5-point format (1 through 5), according to the degree to which they are descriptive of the respondent. Thus, scores on each of the scales range from 10 through 50. Goodstein & Lanyon (2005) developed normative, reliability, and validity data for these seven scales.

The original English-language version of the Cognitive Ability Test contains 30 items selected through a similar lengthy series of development and refinement steps (Goodstein & Lanyon, 2005). This test has been shown to be highly reliable, and to correlate well with other, well-established measures of cognitive ability.

A Chinese language version of **Clues®** was developed in response to a request from a group interested in using such a pre-employment measure in the People's Republic of China. The present paper describes those efforts and their outcomes. The accepted procedure for translation of psychological tests is the back-translation method (Brislin, Lonner, & Thorndike, 1973; Butcher & Pancheri, 1976). This procedure involves an initial translation by one or more bilingual persons, followed by independent back-

translation by different bilingual translator(s). Items that do not “come back” in identical form are then discussed, and the differences reconciled. The back-translation method was followed for both tests of **Clues®**: the Cognitive Ability Test and the Personality Test. Simplified Chinese was used throughout. The development of each test is described below.

### **Cognitive Ability Test**

Some of the items in the English-language version of the Cognitive Ability Test refer to concepts and metrics that might not be directly meaningful in China, such as monetary quantities in dollars and cents, and the use of English-language capital letters involved in several items assessing clerical and spatial abilities. Therefore, four items from a preliminary form of the English version of the test that had not been included in the final form but whose psychometric properties were already known were substituted for existing items of reasonably similar content. Minor rewording of two other items made them more appropriate for Chinese usage without altering their meaning. Several additional items of the English version were considered for replacement, but were retained after discussion and consideration led to the conclusion that they would continue to be meaningful and appropriate in Chinese translation. This modified version was then subjected to the back-translation procedure. This translation is referred to here as the Chinese Cognitive Ability Test.

### **The data pool**

The Chinese Cognitive Ability Test was administered to 1,305 job applicants in real-life job application settings in the People’s Republic of China. Most of these respondents were applying for jobs in large multi-national firms or Western-oriented businesses.

The instructions to the test takers were identical to those used in the United States, and the same seven-minute time limit was imposed.

Since it has long been established that a variety of demographic variables affect test scores, especially measures of cognitive ability, demographic data were requested from each applicant on a voluntary basis. Not all of the applicants provided all requested demographic information, but it is reasonable to assume that the demographic characteristics of those respondents who did respond fully were essentially the same as those who did not.

### **Norms**

Cumulative percentile scores on the Chinese language version of the Cognitive Ability Test were computed from the frequency distribution of the 1,305 job applicants. These cumulative percentiles, shown in Table 1, are the data for our computer-based scoring algorithms. The overall mean score was 22.30 with a range of 5 to 29. In marked contrast, the mean Cognitive Ability score of a large US sample was 14.09, a difference of 8.21 points. As can be seen in Table 1, the frequency distribution for the Chinese sample is quite skewed with 11 percent scoring between 1 and 15, and 13 percent scoring 28 or 29. There are two possible reasons for the sizeable difference in means. One is that the Chinese sample is much better educated than the US sample. As can be seen from Table 2, more than 83 percent of the Chinese test-takers had at least a bachelor's degree (compared with only 10 percent of our US sample). US census data indicate that overall, less than 25 percent of all Americans have a bachelor's degree or more. Although a far smaller proportion of Chinese people have a bachelor's degree, most of the job applicants taking this test clearly did. With globalization, an educated middle class has begun to

come into existence, and these are the individuals who are applying for jobs with the international and Westernized companies that are using **Clues®** for pre-employment testing.

A second reason for this large discrepancy is that the Chinese Cognitive Ability Test turned out to be too easy for this population. The translation produced many easy items with a very high percentage of correct responses. Since it is important that a cognitive ability test differentiate individuals at both ends of the ability continuum, we plan to conduct an item analysis in order to identify items that do not discriminate, and develop alternative items that do so.

### **Demographic factors**

*Gender.* These data are presented in Table 2. Of the 1,189 respondents who indicated their gender, 519 (44%) were male and 670 (56%) were female. The means for males and females are 22.67 and 22.39 respectively. Thus, with regard to gender, the scores for males and females are virtually identical. The means for males and females are both slightly higher than the overall mean because those respondents who did not indicate their gender had disproportionately lower scores.

These figures differ from those of the US sample in two respects. First, approximately two-thirds of the US sample were women and one-third men (Goodstein & Lanyon, 2005). Second, the mean for the US men (15.00) was more than two points higher than that of the US women (13.32). We believe the differences between the US and Chinese samples reflect differences in the labor markets between the two countries and the types of jobs for which the candidates are applying.

*Age.* Test data for three age ranges are given in Table 2. The mean scores for three age ranges show some differences, with the oldest age group (40 and older) scoring lower than the younger respondents. It should be noted that the number of persons in the oldest group is very small ( $N = 30$ ), and perhaps not representative. No such differences were found across age groups for the US sample (Goodstein & Lanyon, 2005). Again, we believe these differences are attributable to differences in the two labor markets.

*Education.* Table 2 also gives test data across four levels of education. The observed differences all were in the expected direction, with almost a full standard deviation between the mean of the lowest group (12 or fewer years of education) and that of the highest group (more than 16 years). These findings mirror those from the US sample.

### **Reliability**

The reliability of a psychological test or scale can be defined in two ways, one of which (internal consistency) refers to the extent to which all the items assess the same concept or variable. The statistic termed *Cronbach's alpha* was used to measure the internal consistency of the Chinese version of the Cognitive Ability Test. The obtained alpha was .85, which reflects a high degree of reliability and indicates that the items of the test are consistent in assessing the single central concept, cognitive ability. It is also virtually identical to the internal consistency computed for the US sample, which was .88 (Goodstein & Lanyon, 2005). Thus, it can be concluded the Cognitive Ability Test is equally highly reliable in China and the US.

### **Chinese Personality Test**

In planning to adapt the personality test for use in China, two issues were initially considered: the need to maintain closely the meaning of each item; and the extent to

which the items, when translated accurately, would maintain their capacity for cohesive measurement of the seven basic characteristics.

As a precautionary measure in preparation for addressing these issues, 34 additional items were included in the test format, making 104 items in all. The psychometric characteristics of the additional items were already known, and they were considered to be possible replacements for items whose relevance in assessing their particular concepts might be lost either in the translation process or because of differences in meaning between the cultures. The 104 items were then subjected to the back-translation procedure. The translation is referred to here as the Chinese Personality Test.

This form of the test was administered to an initial group of 272 job applicants with characteristics similar to those described above for the Cognitive Ability Test, with no time limit.

### **Internal validity**

The *internal validity* of each scale refers to the extent to which the individual items are valid measures of the overall concept being assessed by the scale. This is assessed by first computing an overall score for each scale and then computing the individual correlation of each item with the overall score for its particular scale. In order to determine whether an item would be better suited for a different scale other than the one for which it was written, correlations of all items were also computed with the overall scores on the six remaining scales.

A summary of these data from the initial group of 270 job applicants is presented in Table 3. All but two of the 70 items had highly significant correlations ( $p < .001$ ) with their own scales and higher than their correlations with any of the other scales. The re-

maintaining two correlations were also statistically significant ( $p < .01$  and  $p < .05$  respectively). The range of all correlations between items and their own scale was .13 through .73, with a median correlation of .55.

Comparison of these results with those from the US sample (Goodstein & Lanyon, 2005) showed a close degree of correspondence. In other words, the translated items continued to represent the same concepts as in the English language with almost no exceptions. Based on this high degree of correspondence, it was decided to utilize the same 70 personality items for the Chinese version and *not* to substitute any of the 34 possible alternative items.

### **Relationships among the scales**

All of the following results are based on an extended group of 1,419 job applicants with the characteristics described above, including the 1,305 who took the Cognitive Ability Test. The correlations among the seven scales for the Personality Test are shown in Table 4. As with the English-language version, these correlations are small to moderate. Although the Big Five dimensions have been shown to be statistically independent of each other in many populations, there is no reason to suppose that they would be found to be independent in specialized assessment settings such as with candidates applying for a job.

Overall, the pattern of correlations shown in Table 4 is virtually identical to that found for the English-language version (Goodstein & Lanyon, 2005). The median of the correlations (absolute value) shown in Table 4 is .39, which is identical to the median correlation for the English-language version.

## Norms

As stated above, of the 1,189 respondents who indicated their gender, 519 (44%) were male and 670 (56%) were female. Means and standard deviations on the seven personality scales for all respondents and for males and females separately are shown in Table 5. These data serve as the basis for development of the necessary scoring algorithms.

It is interesting to note that the means presented in Table 5 are mostly lower than for the English-language version. The Chinese appear somewhat less conscientious, a bit more tough-minded, somewhat less rule-bound, a good bit less extroverted, less stable, and somewhat less willing to be team players than the Americans. The differences on the Good Impression scale seem to suggest that the Chinese respondents are generally more willing than US respondents to admit their faults and deficiencies, a tendency that runs through all of these personality data.

One might question whether these differences are due to the differences in the educational levels between the two samples, but it should be noted that in the US sample there were no differences in mean scores on the several personality scales as a function of level of education. Also, as we point out below, there were no general differences in mean personality test scores among the Chinese educational levels. More likely hypotheses to explain the differences are the Chinese respondents' general lack of familiarity with tests of this type, leading to greater honesty; and/or perhaps true cultural differences in personality characteristics.

These results are in sharp contrast to those of Zhang, Lee, Liu, and McCauley (1999), who reported that their American samples of college students were less conscientious and less extroverted than the samples of Chinese college students. One likely ex-

planation is the difference in the two populations sampled. Zhang et al. reported on college students, while our results are based on job applicants, primarily college graduates. Obviously, these differences require additional research for resolution.

### **Demographic factors**

*Gender.* Comparison of the means for males and females in Table 5 shows that the differences are small—less than one point and less than half a standard deviation on all but one scale. The single exception is on the Good Impression scale, where the mean score for males is about two points lower than the mean for females, suggesting that the females are more concerned with making a good impression by denying faults than the men. A similar difference in mean Good Impression scores between men and women was found in the US sample as well.

*Age.* Means and standard deviations for each of the seven scales in three age groups (16-29, 30-39, and 40-67) are shown in Table 6. The means for three of the scales—Extroverted, Stable, and Good Impression—are rather similar, with differences of less than one-half of a standard deviation. But there are noteworthy and interesting mean differences on four of the scales. The oldest group (aged 40-67) has lower mean scores on Conscientiousness and Teamwork and higher mean scores on Tough-mindedness and Rule-bound, suggesting that this oldest group reflects the fact that they have lived more of their adult lives in a more traditional Communist society. In such a society, obeying the rules (at least on the surface), being assertive and tough, avoiding group involvement, and pretending to work rather than focusing on accomplishment were perhaps paths to success, or at least ways of staying out of trouble. It will be interesting

to determine the degree to which such persons can adapt to the new Chinese work ethos and shed whatever remains of their Communist-inspired characteristics.

*Education.* Means and standard deviations for each of the seven scales at four levels of education (high school or less, some college, college graduates, and beyond college) are shown in Table 7. While there are no large differences among these means, there are some trends worth noting. Four of the scales—Conscientious, Extroverted, Stable, and Teamwork—all show systematic increases over the four levels of education, while two show a systematic decrease—Tough-mindedness and Rule-bound. Only the means on the Good Impression scale provide highly similar means. It is interesting to note that this is the exact pattern of scores—more hard-working, friendly, emotionally stable, team-oriented, likeable, and flexible—that should lead to greater on-the-job success. Testing this hypothesis over time will be an important part of our continuing research agenda.

### **Reliability**

Internal consistency coefficients (Cronbach's alpha) for each of the seven scales are presented in Table 3. They are all highly significant and compare favorably with internal consistency coefficients from similar scales (e.g., Lanyon & Goodstein, 1997). The median of these coefficients (.73) is the same as the median of the reliability coefficients of the scales in the English-language version.

### **Summary**

Aside from translation, development of the Chinese version of the **Clues®** Cognitive Ability Test required modification of the content of only a few items; and the Personality Test, none at all. To develop the Chinese version of the Cognitive Ability Test,

several items of the English-language version involving money and other units of measurement were replaced or modified. The back-translation procedure was then employed to ensure the accuracy of the original translation. The psychometric characteristics of the translated version, based on the responses of 1,305 job applicants in China, indicated that the translation was appropriate. To develop the Chinese Personality Test, the English language personality test was translated and then back-translated before being administered to 1,419 job applicants in China. The psychometric characteristics of the Chinese language version showed close equivalency to the English-language version. Normative data were generated for both Chinese language tests and provide the basis for our computer-based scoring algorithms.

The Chinese responses to the Cognitive Ability Test produced a frequency distribution skewed toward the upper end and with a higher mean score than that of the US sample. These differences were ascribed to the substantially higher level of education of the Chinese sample and the fact that some of the translated items turned out to be much easier in China. This means, of course, that a different scoring algorithm is used for China. The analysis across demographic variables showed that higher levels of education were associated with high Cognitive Ability Test scores, but there were no gender differences and only slight age differences. The reliability of the Cognitive Ability Test, as measured by Cronbach's alpha, was high.

The responses from the Chinese sample on the Personality Test showed a strikingly similar structure to that of the US sample as revealed by a comparison of the inter-correlation matrices, although there were differences between the two groups that necessitated establishing separate Chinese norms. Most important among these differences

was the willingness of Chinese respondents to admit their faults and deficiencies, which is reflected in the scoring algorithm developed for use in China. Overall, there were only slight variations between the Chinese and US Personality Test in the pattern of differences due to gender, age, or education. The reliabilities of the Chinese Personality Test scales, as measured by Cronbach's alpha, were moderate to high and mirrored those of the US data.

Our data strongly support the conclusion that the two **Clues®** tests—the Cognitive Ability Test and the Personality Test—can be used successfully in China. The remaining critical issue is the validity of the Chinese version of the two tests in identifying successful on-the-job performance. We will address this issue as we put **Clues®** into operation in the People's Republic of China. Two other questions also merit further exploration. First, the level of difficulty of the Cognitive Test items needs fuller examination; and second, we have the opportunity to develop additional insights into the differences between the Chinese and US cultures as revealed by **Clues®**.

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## References

- Brislin, R. W., Lonner, W. J., & Thorndike, R. M. (1975). *Cross-cultural research methods*. New York: Wiley.
- Butcher, J. N., & Pancheri, P. (1979). *A handbook of cross-national MMPI research*. Minneapolis: University of Minnesota Press.
- Cheung, F. M., Leung, K., Zhang, J-X., Sun, H-F., Gan, Y-Q., Song, W-Z., & Xie, D. (2001). Indigenous Chinese personality constructs. *Journal of Cross-Cultural Psychology*, 32, 407-433.
- DeRaad, B., & Peabody, D. (2005). Cross-culturally recurrent personality factors: Analyses of factors. *European Journal of Psychology*, 19, 451-462.
- Goodstein, L. D., & Lanyon, R. I. (2005). *JobCLUES: Technical and administrative manual*. Atlanta: Psychometrics International.
- Hamid, P. N. (1994). Assertiveness and personality dimensions in Chinese students. *Psychological Reports*, 75, 127-130.
- John, O. P., & Srivastava, S. (1999). The Big-Five trait taxonomy: History, measurement, and theoretical perspectives. In L. Pervin & O. P. John (Eds.) *Handbook of personality: Theory and research* (2<sup>nd</sup> ed.). New York: Guilford.
- Lanyon, R. I., & Goodstein, L. D. (1997). *Personality assessment* (3rd ed.) New York: Wiley.
- Liu, L. S., Friedman, R. A., Chi, S-C. (2002). Negotiating in Different Cultures: Are Western Personality Dimensions Relevant in Chinese Culture? IACM 15<sup>th</sup> Annual Conference. Available at SSRN: <http://ssrn.com/abstract=305202> or  
OI: [10.2139/ssrn.305202](http://dx.doi.org/10.2139/ssrn.305202).

- Rolland, J-P. (2002) The cross-cultural generalizability of the five-factor model of personality. In R. R. McCrae & J. Allik (Eds.), *The five-factor model of personality across cultures*. Amsterdam: Kluwer Academic/Plenum.
- Tupes, E. C., & Cristal, R. E. (1961). Recurrent personality factors based on trait ratings. USAF ASD Technical Report, 61-97.
- Ward, C., Leong, C-H. & Low, M. (2004). Personality and Sojourner adjustment: An explanation of the Big Five and the cultural fit proposition. *Journal of Cross-Cultural Psychology*, 35, 137-151.
- Yang, K-S., & Bond, M. H. (1990). Exploring implicit personality theories with indigenous or imported constructs: The Chinese case. *Journal of Personality and Social Psychology*, 58, 1087-1095.
- Zhang, K., Lee, Y-T., Liu, Y., & McCauley, C. (1999). Chinese-American differences: A Chinese view. In Lee, Y-T., McCauley, C. R., & Draguns, J. G. (Eds.), *Personality and person perception across cultures*. Hillsdale, NJ: Erlbaum.

Table 1

Cumulative Percentiles on the Chinese Cognitive Ability Test for 1,305 Chinese Job Applicants

| Raw score | Cumulative percentile |
|-----------|-----------------------|
| 5         | 1                     |
| 6         | 2                     |
| 7         | 2                     |
| 8         | 3                     |
| 9         | 3                     |
| 10        | 4                     |
| 11        | 5                     |
| 12        | 6                     |
| 13        | 8                     |
| 14        | 9                     |
| 15        | 11                    |
| 16        | 14                    |
| 17        | 17                    |
| 18        | 21                    |
| 19        | 25                    |
| 20        | 29                    |
| 21        | 35                    |
| 22        | 41                    |
| 23        | 48                    |
| 24        | 57                    |
| 25        | 67                    |
| 26        | 78                    |
| 27        | 87                    |
| 28        | 95                    |
| 29        | 99                    |

Table 2

Means, Standard Deviations, Medians, and Ranges on the Chinese Cognitive Ability Test According to Gender, Age, and Education, Together with Comparison Means for the US Cognitive Ability Test

|                        | N <sup>a</sup> | Per-centage | Mean  | SD   | Median | Range | US Mean |
|------------------------|----------------|-------------|-------|------|--------|-------|---------|
| <u>All respondents</u> | 1,305          | 100         | 22.30 | 5.41 | 23     | 0-30  | 14.09   |
| <u>By gender</u>       |                |             |       |      |        |       |         |
| Male                   | 519            | 43.7        | 22.67 | 5.32 | 24     | 0-30  | 15.50   |
| Female                 | 670            | 56.3        | 22.39 | 5.18 | 23     | 0-30  | 13.32   |
| <u>By age</u>          |                |             |       |      |        |       |         |
| 16-29                  | 750            | 78.4        | 22.75 | 5.02 | 24     | 0-30  | 14.12   |
| 30-39                  | 176            | 18.4        | 22.27 | 5.45 | 23     | 2-29  | 14.08   |
| 40-63                  | 30             | 3.1         | 18.67 | 6.30 | 19     | 5-28  | 14.05   |
| <u>By education</u>    |                |             |       |      |        |       |         |
| 12 or less             | 62             | 5.2         | 19.29 | 5.88 | 20     | 5-29  | 12.67   |
| 13-15                  | 139            | 11.6        | 20.04 | 5.54 | 21     | 1-29  | 13.65   |
| 16                     | 622            | 51.7        | 22.56 | 5.00 | 23     | 0-30  | 16.68   |
| 17 or more             | 380            | 31.6        | 24.07 | 4.65 | 25     | 0-30  | 16.32   |

<sup>a</sup>Reporting of demographic information by respondents who took the Cognitive Ability Test was incomplete.

Table 3

Ranges and Medians of Item/Scale Correlations for Each Scale on the Chinese Personality Test for 272 Chinese Job Applicants, and Reliability Correlations (Cronbach's Alpha) for 1,419 Applicants

| Scale           | Internal Validity |        | Reliability |
|-----------------|-------------------|--------|-------------|
|                 | Range             | Median |             |
| Conscientious   | .35 -.61          | .54    | .75         |
| Tough-minded    | .29 -.63          | .50    | .70         |
| Rule-bound      | .25 -.71          | .56    | .73         |
| Extroverted     | .17 -.64          | .51    | .69         |
| Stable          | .13 -.73          | .59    | .75         |
| Teamwork        | .45 -.69          | .63    | .83         |
| Good Impression | .24 - .70         | .54    | .70         |

*Note.* The sign of the correlation, whether positive or negative, is ignored.

Table 4

Correlations Among Scales of the Chinese Personality Test for 1419 Chinese Job

Applicants

| Scale           | Conscientious | Tough-Minded | Rule-bound | Extroverted | Stable | Teamwork |
|-----------------|---------------|--------------|------------|-------------|--------|----------|
| Tough-minded    | -.49          |              |            |             |        |          |
| Rule-bound      | -.26          | .31          |            |             |        |          |
| Extroverted     | .47           | -.41         | -.46       |             |        |          |
| Stable          | .45           | -.48         | -.43       | .55         |        |          |
| Teamwork        | .43           | -.52         | -.26       | .35         | .36    |          |
| Good Impression | .49           | -.46         | -.09       | .22         | .40    | .36      |

Table 5

Means and Standard Deviations for the Seven Scales of the Chinese Personality Test for 1,419 Job Applicants Overall and for Males and Females Separately

| Scale           | All respondents<br>(N = 1,419) |      | Males<br>(N = 519) |      | Females<br>(N = 670) |      | U.S. norms<br>(N = 2,306) |      |
|-----------------|--------------------------------|------|--------------------|------|----------------------|------|---------------------------|------|
|                 | M                              | SD   | M                  | SD   | M                    | SD   | M                         | SD   |
| Conscientious   | 35.27                          | 5.81 | 35.16              | 6.01 | 35.89                | 5.54 | 39.93                     | 5.66 |
| Tough-minded    | 21.84                          | 5.39 | 22.04              | 5.49 | 21.12                | 5.28 | 19.47                     | 5.20 |
| Rule-Bound      | 21.66                          | 5.42 | 21.29              | 5.06 | 21.45                | 5.28 | 23.99                     | 4.98 |
| Extroverted     | 33.10                          | 5.77 | 33.48              | 5.87 | 33.21                | 5.70 | 39.43                     | 6.32 |
| Stable          | 34.14                          | 6.15 | 34.58              | 6.16 | 34.18                | 6.01 | 38.63                     | 5.71 |
| Teamwork        | 37.07                          | 6.47 | 37.88              | 6.85 | 37.08                | 6.14 | 38.58                     | 6.33 |
| Good impression | 31.71                          | 6.66 | 30.93              | 6.61 | 32.77                | 6.77 | 37.87                     | 7.15 |

*Note.* Of the 1,419 applicants, 1,189 reported their gender.

Table 6

Means and Standard Deviations for the Seven Scales of the Chinese Personality Test for 1,026 Job Applicants over Three Different Age Ranges

| Scale                | Ages 16-29<br>(N = 810) |      | Ages 30-39<br>(N = 186) |      | Ages 40-67<br>(N = 30) |      |
|----------------------|-------------------------|------|-------------------------|------|------------------------|------|
|                      | M                       | SD   | M                       | SD   | M                      | SD   |
| Conscientious        | 35.49                   | 5.99 | 37.05                   | 5.04 | 33.97                  | 4.71 |
| Tough-minded         | 21.17                   | 5.52 | 21.38                   | 4.63 | 24.33                  | 5.00 |
| Rule-bound           | 21.08                   | 5.25 | 21.37                   | 5.07 | 27.10                  | 7.04 |
| Extroverted          | 33.47                   | 5.60 | 34.10                   | 5.73 | 30.90                  | 5.91 |
| Stable               | 34.42                   | 6.25 | 35.27                   | 5.17 | 32.23                  | 7.29 |
| Teamwork             | 37.71                   | 6.52 | 37.72                   | 6.47 | 34.27                  | 6.07 |
| Good Impres-<br>sion | 31.74                   | 6.82 | 33.84                   | 6.45 | 33.03                  | 6.90 |

*Note.* Of the 1,419 applicants, 1,026 reported their age.

Table 7

Means and Standard Deviations for the Seven Scales of the Chinese Personality Test for Job Applicants at Four Different Levels of Education

| Scale           | High school or less (N = 62) |      | Some college (N = 149) |      | College graduate (N = 622) |      | Beyond college (N = 380) |      |
|-----------------|------------------------------|------|------------------------|------|----------------------------|------|--------------------------|------|
|                 | M                            | SD   | M                      | SD   | M                          | SD   | M                        | SD   |
| Conscientious   | 33.15                        | 5.01 | 34.20                  | 6.19 | 35.38                      | 5.77 | 36.82                    | 5.48 |
| Tough-minded    | 23.08                        | 4.89 | 22.47                  | 5.83 | 21.82                      | 5.26 | 20.57                    | 5.34 |
| Rule-bound      | 23.05                        | 5.61 | 22.41                  | 6.30 | 21.44                      | 5.29 | 20.84                    | 4.93 |
| Extroverted     | 31.61                        | 5.14 | 32.25                  | 5.83 | 33.16                      | 5.92 | 34.21                    | 5.43 |
| Stable          | 32.84                        | 5.96 | 33.13                  | 6.63 | 34.24                      | 6.04 | 35.21                    | 5.86 |
| Teamwork        | 36.77                        | 6.69 | 36.30                  | 6.63 | 37.16                      | 6.32 | 38.43                    | 6.42 |
| Good Impression | 31.35                        | 5.33 | 31.32                  | 6.61 | 31.64                      | 6.82 | 32.86                    | 6.78 |

*Note.* Of the 1,419 applicants, 1,213 reported their education level.