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Cecil Don Means
University of Dayton

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QUANTIFICATION OF RESPONSE ALTERNATIVES OF ACCEPTABILITY,
ADEQUACY, AND RELATIVE GOODNESS RATINGS FOR A
WORKING AGE POPULATION

Thesis

Submitted to

The Graduate School of Arts and Sciences

UNIVERSITY OF DAYTON

In Partial Fulfillment of the Requirements for

The Degree

Master of Arts in Human Factors/Experimental Psychology

by

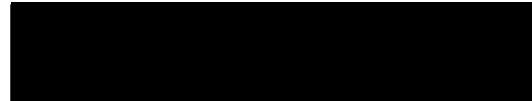
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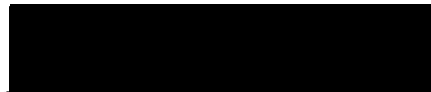
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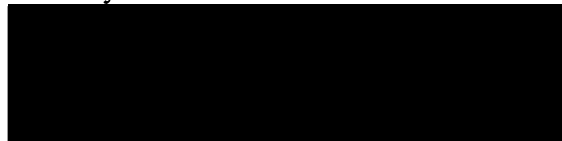
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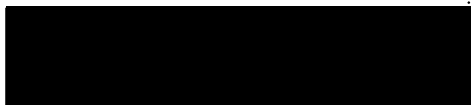
Moroney, William F., Ph.D., CPE
Faculty Advisor



Biers, David W., Ph.D.
Faculty Reader



Davis, Susan, Ph.D.
Faculty Reader



Biers, David W., Ph.D.
Chair, Department of Psychology

ABSTRACT

QUANTIFICATION OF RESPONSE ALTERNATIVES OF ACCEPTABILITY, ADEQUACY, AND RELATIVE GOODNESS RATINGS FOR A WORKING AGE POPULATION

Name: Means, Cecil Don
University of Dayton

Advisor: William F. Moroney, Ph.D.

While questionnaires are routinely used by researchers, generating response alternatives which all respondents interpret in a similar fashion is often difficult. Researchers often assume an underlying equidistant continuum when creating scales of response alternatives, but research has indicated that samples with different backgrounds (students/non-students, age, education) assign different values to the adverb intensifiers.

Krsacok (2001) reported significant differences in ratings generated by college males and US Army personnel from a 1978 study (Matthews, Wright, Yudowitch, Geddie, and Palmer). The current study examined numerical ratings assigned to response alternatives by working age males and females from a variety of age, educational, and occupational groups and contrasts them with data from U.S. Army personnel and college students. Using a procedure similar to Matthews et al. and Krsacok, two hundred and six working age participants rated response alternatives of acceptability, adequacy, and relative goodness on a scale of -5 to +5.

Differences in mean ratings, variability, and rating order generated by working age personnel, US Army personnel and college students were compared. In addition, ratings assigned by working age personnel subgroups segmented by sex, age, education level, and occupation level were analyzed. The only consistent significant differences in mean ratings were found between working age personnel and college students (working age males vs. college males, working age females vs. college females, and working age personnel vs. college students). Variability differences were also noted for most of the group and subgroup comparisons, although there was no discernable pattern. Regardless of differences in mean ratings, the rating order remained consistent across all group and subgroup comparisons. The current results suggest that subject factors associated with student and non-student status account for consistent mean rating differences, while the time between studies was not a factor.

Since the mean ratings generated by working age males and females for response alternatives on all three lists of acceptability, adequacy, and relative goodness differed significantly from mean ratings generated by college males and females, a new series of scales reflecting the connotative values of the working age population was developed.

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CHAPTER I

INTRODUCTION

Psychological, sociological, political, and business researchers employ questionnaires as a data collection tool which permits data collection from large numbers of participants. While questionnaires are routinely used, generating response alternatives, which all respondents interpret in a similar fashion and respond to properly is often difficult (Dillman, 2000).

Questionnaires designers often structure questions so that respondents make judgments such as "how much," "how often," or "how adequate". Respondents indicate these judgments on a continuum defined by a scale with an extreme negative anchor (extremely inadequate) and an extreme positive anchor (extremely adequate). The scale is incremented by adding "balanced" terms that are intended to represent equal and opposite meanings (very inadequate/very adequate). For example, respondents may be asked to indicate their response to the following question by circling a term on the scale below:

How adequate was the informed consent form in describing the conditions of this questionnaire?

Extremely inadequate
Very inadequate
Slightly inadequate
Neither inadequate nor adequate
Slightly adequate
Very adequate
Extremely adequate

Rating scales have been the focus of research studies for many years (Likert, 1932; Simpson, 1944; Osgood & Sebeok, 1952; Bass, Cascio, O'Conner, 1974; Dumas, Johnson, Lynch, et al., 2002). Much of the research focuses on quantitative analyses of these rating scales in an attempt to develop reliable, numerically equidistant adverb intensifiers or response alternatives. This introduction provides an overview of response alternative research, different techniques for constructing response alternative scales, and possible sources of differences in response alternative ratings.

Response Alternative Quantitative Analysis

Several methods have been used in response alternative research, and substantial evidence supports Steven's (1956) magnitude estimation technique (MET) as a superior technique (Bolanowski & Gescheider, 1991). Following the inception of MET the majority of MET uses were related to psychophysical research (e.g. scaling stimuli such as sound and light). In addition to psychophysical research, other scale domains such as business and social issues have been studied using MET (Bass, 1968).

MET requires participants to assign a numeric estimate to a baseline, called the referent. Participants then assign proportional values relative to the referent for subsequent stimuli. An example procedure might begin with a participant assigning a value of 50 to the referent "sometimes." This would be followed by the participant assigning values of 58 to "somewhat often" and 39 to "occasionally," since these referents are interpreted as more and less than "sometimes," respectively.

Schriesheim and Castro (1996) investigated if the selection of the referent or base stimulus affects the results of the MET scaling of frequency expressions. They found that different standards (referents) result in different ratings. Specifically, Schriesheim

and Castro performed t tests on scale values obtained in their study and the same scale values obtained in previous studies. They found many more significant differences between the scale values generated with the “fairly many times” referent compared with scale values generated with the “sometimes” referent. Based on their studies, Schriesheim and Castro reached the following conclusions:

1. A single referent should be avoided for MET studies. Therefore, other approaches may be employed, e.g. Absolute Magnitude Estimation (AME), where response alternatives are rated without a referent.
2. Scale values “that have been produced in single-referent studies should probably not be relied upon in the selection of alternatives for equal interval response anchors.”

Independent of the use of a referent, when gathering data on the response alternatives, some researchers present the stimuli in the context of important issues, while others present the expressions in the context of unimportant issues or no issues. Bass et al. (1974) studied the sensitivity of response alternative ratings for important versus unimportant issues. They found there were no significant differences in the values assigned to expressions of frequency and amount when describing both important and unimportant topics. This conclusion was found to be the same for MBA, college, and high school students.

While MET and AME focus on one word at a time, researchers have developed theories for quantitatively combining multiple descriptors, such as “somewhat pleasant” and “quite inferior.” The first “Law of Word Mixture” (Osgood & Sebeok, 1954) provides a quasi-quantitative analysis for combining words in an averaging effect.

Osgood and Sebeok's "Law of Word Mixture" was primarily an additive technique, focusing on adjective-noun word pairs. Based on Osgood and Sebeok's suggestion that the meaning of words may be projected in coordinate space, Cliff (1959) reasoned that words do not have a projection of their own, but stretch or compress the projections of other words, acting similar to scalar multipliers of vector algebra.

Cliff (1959) identified words with these properties as intensive adverbs. He describes the similarities between scalar multipliers of vector algebra and intensive adverbs as intuitive. For example, "very" applied to "bad" or to "pleasant" increases the intensity of the word in both the negative and positive dimensions, respectively. While Osgood's "Law of Word Mixture" combines the numeric meaning of words in an additive fashion, Cliff developed a "Law of Word Mixture" with the following properties:

1. There is a number associated with each adjective.
2. There is a number associated with each adverb.
3. The intensity of an adverb-adjective combination is the product of these two numbers.
4. The intensity of the adjective used alone is the number associated with it when used in combination.
5. A set of adjectives can be chosen which may be scaled on a single dimension on which all will have the same zero point.

While Osgood and Sebeok (1954) postulated words should be combined in an averaging effect, Cliff's (1959) "Law of Word Mixture" suggests adverb-adjective pairs should be combined in a multiplicative fashion.

Response Alternative Scales

Although Cliff (1959) did not produce scales of response alternatives, he used the “Law of Word Mixture” to generate quantitative values for word combinations, which could be used as response alternatives. Table 1 shows multiplier values for adjectives and adverbs that can be combined in a multiplicative fashion to generate values for the word pairs.

Table 1. Adverb and adjectives intensity multipliers (Cliff, 1959)

Adverb	Multiplier
(Unmodified)	1
Slightly	0.559
Somewhat	0.719
Rather	0.887
Pretty	0.961
Quite	1.109
Decidedly	1.231
Unusually	1.324
Very	1.323
Extremely	1.546

Adjective	Multiplier
Evil	-0.993
Wicked	-0.997
Contemptible	-0.882
Immoral	-0.954
Disgusting	-0.902
Bad	-0.796
Inferior	-0.861
Ordinary	-0.223
Average	-0.211
Nice	1.011
Good	1.075
Pleasant	0.974
Charming	0.91
Admirable	1.086
Lovable	0.812

To derive the intensity of the adjective/adverb combinations, Cliff (1959) constructed the main part of his questionnaire as a rating scale with whole integer values ranging from negative five and positive five (Figure 1).

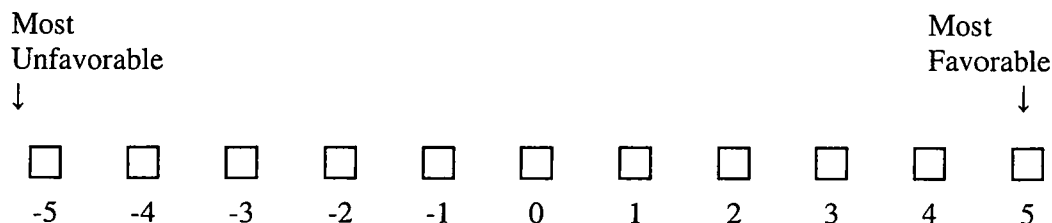


Figure 1. Cliff (1959) rating scale

Adverb Intensifier Research studies by Matthews, Wright, Yudowitch, Geddie, and Palmer (1978) and Krsacok and Moroney (2002) used the same rating scale format (Figure 1) to generate numerical values for adverb intensifiers. Their studies, which are discussed later, have been used to create statistically valid scales for several different populations.

Bass et al. (1974) used MET ratio scaling to generate numerical values for response alternatives. A goal of the Bass et al. study was to obtain reliably established geometric means and standard deviations of magnitude estimations of lists of response alternatives of frequency and amount. To gather the data, Bass et al. used an anchoring term, a referent, and asked participants to rate the response alternatives relative to the referent. For example, participants would rate “sometimes” on a frequency scale and then would indicate the value of 28 other adverbs relative to the referent “sometimes.” Bass et al. then created scales with 4-9 adverbs with an approximate relationship to each other of 5:4:3:2:1:0 (always; frequently, if not always; quite often; sometimes; once in a while; never). An example of six optimal scales of frequency is provided in Table 2.

Table 2. Statistically optimal scales of frequency (Bass et al., 1974)

Number of Scale Points					
9	8	7	6	5	4
Always	Always	Always	Always	Always	Always
Continually	Continually	Constantly	Frequently, if not always	Very often	Often
Very often	Very often	Often	Quite often	Fairly many times	Sometimes
Quite often	Rather frequently	Fairly many times	Sometimes	Occasionally	Never
Fairly many times	Sometimes	Sometimes	Once in a while	Never	
Sometimes	Now and then	Once in a while	Never		
Occasionally	Not often	Never			
Not very often	Never				
Never					

Bass et al. (1974) demonstrated for three samples of judges of different ages, educational, and occupational levels and for important and unimportant issues that it is possible to assign quantitative meanings to verbal judgments. Bass et al. concluded that the percentage of overlap in adjacent judgments increases as the number of scale points increases. In other words, the more scale points, the more overlap with adjacent judgments (although each of these scales have integer relations). To quantify this overlap, Tilton's (1937) overlap statistic, *O*, was computed. Bass et al. found with a 9-point scale, the overlap can be as much as 44%. The frequency scales Bass et al. generated and the response alternative values Cliff (1959) derived demonstrate early attempts at generating statistically valid scales for questionnaire design.

Adverb Intensifier Research

Matthews et al. (1978)

Matthews et al. (1978) used a data collection methodology similar to Cliff (1959), with participants rating phrases ranging from negative five to positive five, as shown in Figure 1. Matthews et al.'s study was "... designed to provide objective data concerning the denotative meanings and inherent scale positions of common descriptors used as response alternatives and scale anchors in questionnaire construction." The primary purpose of the study was to obtain norms for military respondents, for perceived values on three scales: acceptability, adequacy, and relative goodness. The perceived values were judged as either favorable or unfavorable (positive or negative).

Matthews et al. (1978) distributed the three lists to a random sample of 50 U.S. Army officers and 50 U.S. Army enlisted personnel. Participants rated descriptors on an 11-point bipolar scale of favorableness and indicated if they seemed ambiguous. After all questionnaires were collected and anomalous responses were eliminated, a sample of 51 usable responses was obtained. The resulting list of "acceptability" descriptors with their corresponding means and standard deviations is provided in Table 3.

Table 3. Means and SDs assigned by U.S. Army Personnel to the "Acceptability" descriptors (Matthews et al., 1978)

	Mean	SD	Min.	Max.	n
Wholly acceptable	4.73	0.56	3	5	51
Completely acceptable	4.69	0.61	3	5	51
Fully acceptable	4.41	0.87	2	5	51
Extremely acceptable	4.39	0.72	3	5	51
Most acceptable	4.16	0.92	2	5	51
Very very acceptable	4.16	0.83	2	5	51
Highly acceptable	4.04	0.63	3	5	50
Quite acceptable	3.22	0.96	1	5	51
Largely acceptable	3.14	0.99	1	5	51
Acceptable	2.39	1.46	0	5	51
Reasonably acceptable	2.29	0.72	1	4	51
Moderately acceptable	2.28	0.72	1	3	50
Pretty acceptable	2.00	1.13	-3	4	49
Rather acceptable	1.94	0.82	0	4	49
Fairly acceptable	1.84	0.92	0	4	50
Mildly acceptable	1.80	0.95	-1	4	51
Mildly acceptable	1.69	0.70	-1	4	51
Somewhat acceptable	1.46	1.24	-2	3	48
Barely acceptable	1.08	0.52	-1	3	51
Slightly acceptable	1.04	0.52	-1	2	51
Sort of acceptable	0.94	0.65	-1	2	50
Borderline	0.00	0.20	-1	1	50
Neutral	0.00	0.00	0	0	51
Marginal	-0.12	0.52	-2	1	50
Barely unacceptable	-1.10	0.30	-2	-1	50
Slightly unacceptable	-1.26	0.59	-4	-1	51
Somewhat unacceptable	-1.77	0.67	-3	-1	51
Rather unacceptable	-2.02	0.84	-4	0	50
Fairly unacceptable	-2.16	0.88	-5	-1	50
Moderately unacceptable	-2.34	0.68	-3	-1	50
Pretty unacceptable	-2.41	0.66	-4	-1	51
Reasonably unacceptable	-2.44	0.75	-4	-1	50
Unacceptable	-2.67	1.38	-5	0	51
Substantially unacceptable	-3.24	0.90	-5	-1	51
Quite unacceptable	-3.39	1.07	-5	0	49
Largely unacceptable	-3.39	0.82	-5	-1	51
Considerably unacceptable	-3.44	0.78	-5	-2	50
Notably unacceptable	-3.50	1.04	-5	-1	50
Decidedly unacceptable	-3.84	1.02	-5	-1	49
Highly unacceptable	-4.22	0.58	-5	-3	50
Highly unacceptable	-4.29	0.54	-5	-3	51
Most unacceptable	-4.42	0.72	-5	-2	50
Very very unacceptable	-4.49	0.50	-5	-4	51
Exceptionally unacceptable	-4.54	0.61	-5	-3	50
Extremely unacceptable	-4.69	0.46	-5	-4	51
Completely unacceptable	-4.90	0.36	-5	-3	50
Entirely unacceptable	-4.90	0.36	-5	-3	50
Wholly unacceptable	-4.92	0.27	-5	-4	51
Absolutely unacceptable	-4.92	0.33	-5	-3	51
Totally unacceptable	-4.94	0.24	-5	-4	51

Matthews et al. (1978) found most of the descriptors were unambiguous to most respondents. After removing potentially problematic descriptors, the resulting lists had 48 acceptability terms, 49 adequacy terms, and 41 relative goodness terms. Neutral and borderline occurred in all three lists and marginal occurred in the acceptability and relative goodness list. Additionally, Matthews et al. repeated the same words within lists to gauge intra-subject consistency. As can be seen from an examination of Table 4, the descriptor means remained relatively stable across and within the lists. This allowed Matthews et al. to construct questionnaire scales so response alternatives did not overlap.

Table 4. Intra-subject response consistency (Matthews et al., 1978)

Descriptor	Mean Within List		Mean Across List		
	1st Usage	2nd Usage	Acceptability	Adequacy	Goodness
Mildly acceptable	1.80	1.69			
Highly unacceptable	-4.22	-4.29			
Exceptionally inadequate	-4.68	-4.56			
Neutral			0.00	0.00	0.00
Borderline			0.00	-0.02	-0.06
Marginal			-0.12		-0.18

Matthews et al. (1978) used the unambiguous response alternatives for acceptability, adequacy, and relative goodness to construct sets of questionnaire items. They used response alternatives or scale anchors that did not overlap in order to avoid respondents attributing the same numerical value to any two different points on the scale. They employed two different methods for constructing non-overlapping response alternatives. The first method consisted of eliminating any items with a SD higher than a 1.0. Then, the scale would start with the largest mean followed by the remaining descriptors in descending order so the interval between each pair of adjacent means was

just greater than the larger SD. This was to ensure that the interval between each pair of adjacent means was greater than zero, but as small as possible without being less than the larger standard deviation of the pair (Highest mean down). A sample 10-point acceptability scale based upon the "Highest Mean Down" technique is shown in Table 5.

Table 5. Matthews et al. (1978) "Highest Mean Down" sample Ten-point acceptability scale

Descriptor	Mean	SD
Wholly acceptable	4.73	0.56
Highly acceptable	4.04	0.63
Reasonably acceptable	2.29	0.72
Barely acceptable	1.08	0.52
Neutral	0	0
Barely unacceptable	-1	0.3
Somewhat unacceptable	-1.77	0.67
Substantially unacceptable	-3.24	0.9
Highly unacceptable	-4.22	0.58
Completely unacceptable	-4.9	0.36

Matthews et al. (1978) used a similar method to generate another set of scales except the midpoint was chosen as the starting point and the selection proceeded in both directions--positive and negative (Midpoint Mean Out). Table 6 is a sample 10-point acceptability scale using the "Midpoint Mean Out" technique. Matthews et al. states the lists are provided more as illustrations of possible methods for constructing good questionnaire items and not as universally ideal lists of descriptors.

Table 6. Matthews et al. (1978) "Midpoint Mean Out" sample 10-point acceptability scale

Descriptor	Mean	SD
Very very acceptable	4.16	0.83
Largely acceptable	3.14	0.99
Mildly acceptable	1.69	0.7
Sort of acceptable	0.94	0.65
Neutral	0	0
Barely unacceptable	-1.1	0.3
Rather unacceptable	-2.02	0.84
Substantially unacceptable	-3.24	0.9
Highly unacceptable	-4.29	0.54
Completely unacceptable	-4.9	0.36

Matthews et al. (1978) noted that response alternative mean ratings "... with the greatest amount of item variability tended to be characterized by extremeness or generality." They speculated that there were considerable differences in the tendency to assign extreme values. Similarly, Krsacok and Moroney (2002) found differences in participants' willingness to assign extreme values, but this was due to sex differences which were not tested for in Matthews, et al.

Krsacok and Moroney (2002)

Krsacok and Moroney (2002) repeated the Matthews et al. (1978) experimental procedure to create statistically valid scales of response alternatives based on the response of undergraduate psychology student participants. Additionally, Krsacok and Moroney sought to determine if differences found between a pilot study conducted by Moroney, Fisher, and Halligan (1993) and Matthews et al. would exist when comparing the values derived from male undergraduate psychology students with the values reported in the male U.S. Army data. Finally, Krsacok and Moroney sought to determine if there

were sex-based differences in the descriptor ratings assigned by undergraduate psychology males and females.

Participants in the Krsacok and Moroney (2002) study were volunteers from the Introduction to Psychology classes at the University of Dayton. The participants assigned numeric values to adverb intensifiers on three lists (acceptability, adequacy, and relative goodness). Krsacok and Moroney replicated the procedure used by Matthews et al. (1978). Fifty-four males and fifty-four females were equally distributed among six counter-balanced sequences (approximately the same number of males as used in Matthews et al., 1978).

Krsacok and Moroney (2002) found that college males and college females showed minimal differences in descriptor ratings on the acceptability, adequacy, and goodness lists. This equality existed for the mean numerical ratings for the scales, the order of the descriptors, and the differences in variability.

The number of significant differences in numerical ratings for adverb intensifiers generated by college males and U.S. Army personnel were greater than the number of significant differences generated by college males and college females (Table 7). In his master's thesis, Krsacok (2001) stated:

The results showed that there were 2.75 times as many significantly different acceptability intensifier ratings between college males and the U.S. Army personnel (22%) than between the college males and college females (8%), 2.83 times as many significantly different adequacy intensifier ratings (12% vs. 34%), and 3.00 times as many significantly different goodness intensifier ratings (15% vs. 44%). (p. 64)

Table 7. Summary of the number of significantly different responses between college males and college females, and between college males and U.S. Army personnel (Krsacok, 2001)

	Acceptability	Adequacy	Goodness
College Males and College Females	4/50 (8%)	6/50 (12%)	6/41 (15%)
College Males and U.S. Army Personnel	11/50 (22%)	17/50 (34%)	18/41 (44%)

Krsacok (2001) performed *t* tests to determine if there were significant differences in the ratings provided by college males and ratings from U.S. Army personnel (Table 8). Krsacok's results revealed significant differences for the values of response alternatives between 22% of the college male and U.S. Army personnel responses on the acceptability list, 34% of the responses on the adequacy list, and 44% of the responses on the relative goodness list. While there were significant differences between the numerical ratings, the order of the descriptors remained very consistent for both U.S. Army personnel and college males as indicated by the high correlations between the means for acceptability, adequacy, and relative goodness, which were 0.997, 0.997, and 0.989, respectively. The stability of descriptor order for college females and college males was also indicated by high correlations between the means for acceptability, adequacy, and relative goodness, which were 0.999, 0.999, and 0.997, respectively.

Table 8. Differences in acceptability ratings between college males and U.S. Army personnel (Krsacok, 2001)

Descriptor	College Males		U.S. Army Personnel		Diff	SIG p < .05
	Mean	SD	Mean	SD		
Completely acceptable	4.59	0.74	4.69	0.61	0.10	
Extremely acceptable	4.51	0.54	4.39	0.70	0.12	
Fully acceptable	4.50	0.72	4.41	0.87	0.09	
Very very acceptable	4.41	0.84	4.16	0.83	0.25	
Wholly acceptable	4.35	0.78	4.73	0.56	0.37	X
Most acceptable	4.17	0.82	4.16	0.92	0.01	
Highly acceptable	4.09	0.49	4.04	0.63	0.05	
Largely acceptable	3.61	0.72	3.14	0.99	0.47	X
Quite acceptable	3.11	0.95	3.22	0.96	0.11	
Pretty acceptable	2.48	0.73	2.00	1.13	0.48	X
Reasonably acceptable	2.44	0.72	2.29	0.72	0.15	
Moderately acceptable	2.26	0.68	2.28	0.72	0.20	
Acceptable	2.20	1.07	2.39	1.46	0.19	
Rather acceptable	2.19	0.74	1.94	0.82	0.25	
Fairly acceptable	2.07	0.75	1.84	0.92	0.23	
Mildly acceptable	1.87	0.75	1.69	0.70	0.18	
Mildly acceptable	1.82	0.69	1.80	0.95	0.02	
Somewhat acceptable	1.70	0.57	1.46	1.24	0.24	
Slightly acceptable	1.23	0.51	1.04	0.52	0.19	
Sort of acceptable	1.06	0.63	0.94	0.65	0.12	
Barely acceptable	0.58	1.09	1.08	0.52	0.50	X
Marginal	0.06	0.45	-0.12	0.52	0.18	
Neutral	0.00	0.00	0.00	0.00	0.00	
Borderline	-0.06	0.41	0.00	0.20	0.06	
Barely unacceptable	-1.06	0.24	-1.10	0.30	0.04	
Slightly unacceptable	-1.22	0.63	-1.26	0.59	0.04	
Somewhat unacceptable	-1.94	0.71	-1.77	0.67	0.17	
Fairly unacceptable	-2.13	0.73	-2.16	0.88	0.03	
Moderately unacceptable	-2.17	0.64	-2.36	0.68	0.17	
Reasonably unacceptable	-2.25	0.76	-2.44	0.75	0.19	
Unacceptable	-2.30	1.16	-2.67	1.38	0.37	
Rather unacceptable	-2.43	0.79	-2.02	0.84	0.41	X
Pretty unacceptable	-2.75	0.78	-2.41	0.66	0.34	X
Notably unacceptable	-2.88	0.94	-3.50	1.04	0.62	X
Decidedly unacceptable	-2.96	1.16	-3.84	1.02	0.88	X
Considerably unacceptable	-3.02	0.92	-3.44	0.78	0.42	X
Quite unacceptable	-3.21	0.74	-3.36	1.07	0.18	
Substantially unacceptable	-3.27	0.95	-3.01	0.90	0.03	
Largely unacceptable	-3.61	0.60	-3.36	0.82	0.22	
Highly unacceptable	-4.15	0.56	-4.22	0.58	0.07	
Highly unacceptable	-4.17	0.50	-4.29	0.54	0.12	
Most unacceptable	-4.42	0.75	-4.42	0.72	0.00	
Wholly unacceptable	-4.44	0.82	-4.92	0.27	0.48	X
Exceptionally unacceptable	-4.58	0.57	-4.54	0.61	0.04	
Very very unacceptable	-4.67	0.55	-4.49	0.50	0.18	
Completely unacceptable	-4.74	0.48	-4.90	0.36	0.16	
Extremely unacceptable	-4.74	0.56	-4.69	0.46	0.05	
Totally unacceptable	-4.77	0.42	-4.94	0.24	0.17	X
Entirely unacceptable	-4.81	0.52	-4.90	0.36	0.09	
Absolutely unacceptable	-4.93	0.26	-4.92	0.33	0.01	

Moroney and Krsacok (2002) used the numerical ratings and order of descriptors to generate different sets of adverb intensifiers for use on rating scales. They generated scales based on three different methods intended to minimize the quantitative overlap between descriptors. The three different methods (Two Standard Deviation Separation, Balanced Numeric Values, and Balanced Terms) used to create different point scales (5, 6, 7, 8, 9, and 11), resulted in a total of 54 adverb intensifier scales for acceptability, adequacy, and relative goodness. The three methods are described in detail below.

Two Standard Deviation Separation Method. The first method used was the Two Standard Deviation Separation method. In this method, the most extreme positive term was selected based upon the highest mean value and small standard deviation, thus indicating a higher level of respondent agreement. After the extreme positive term was selected, the next terms were selected based upon the following criteria:

$$\text{Larger mean} - \text{standard deviation} > \text{smaller mean} + \text{standard deviation}$$

In other words, the next term was selected so the two terms are separated by two standard deviations. The Two Standard Deviation Separation method ensures the distributions of any two adjacent descriptors minimally overlap. Table 9 contains a nine-point scale based upon the Two Standard Deviation Separation method.

Table 9. Nine-point acceptability scale--Two SD (Moroney and Krsacok, 2002)

Descriptor	Mean	SD
Extremely acceptable	4.55	0.59
Quite acceptable	3.17	0.89
Somewhat acceptable	1.69	0.62
Sort of acceptable	1.09	0.58
Neither acceptable nor unacceptable (substituted for neutral)	-0.01	0.1
Barely unacceptable	-1.15	0.51
Moderately unacceptable	-2.21	0.7
Largely unacceptable	-3.71	0.66
Entirely unacceptable	-4.88	0.43

The Two Standard Deviation Separation method attempts to reduce confusion of the region of the rating scale covered by one descriptor with the region covered by another descriptor.

Balanced Terms Method. Another technique Moroney and Krsacok (2002) used to develop scale response alternatives is called the Balanced Terms method. This method uses matched descriptors or “parallel wording” (Babbitt & Nystrom, 1989), such as “extremely acceptable” and “extremely unacceptable.” They grouped all balanced terms and ensured the positive and negative values were nearly equivalent by analyzing the absolute value of the means. From this sub-set, the most extreme balanced terms were selected as the anchor terms. The next pair of terms was selected, which consists of approximately one standard deviation from the first pair. This process was continued until the appropriate number of terms was selected.

Table 10. Nine-point acceptability scale-Balanced Terms (Moroney and Krsacok, 2002)

Descriptor	Mean	SD
Extremely acceptable	4.55	0.59
Largely acceptable	3.68	0.71
Reasonably acceptable	2.45	0.74
Slightly acceptable	1.28	0.55
Neither acceptable nor unacceptable (substituted for neutral)	-0.01	0.1
Slightly unacceptable	-1.23	0.65
Reasonably unacceptable	-2.34	0.79
Largely unacceptable	-3.71	0.66
Extremely unacceptable	-4.75	0.5

Table 10 shows a nine-point acceptability scale based upon the Balanced Terms method.

Balanced Numeric Values Method. The final method Krsacok and Moroney (2002) used to generate response alternatives was the Balanced Numeric Values method. This method balances the numeric values of the descriptor means instead of the terms, as in the Balanced Terms method. The most extreme positive descriptor value with a low standard deviation was selected and matched with a numerically equivalent negative term. The next positive descriptor was selected that had a value approximately one standard deviation from the first positive descriptor; a negative term with approximately the same absolute value was matched. This process was repeated until the appropriate number of response alternatives was selected. Table 11 shows a nine-point scale with the descriptors ordered using the Balanced Numeric Values method.

*Table 11. Nine-point acceptability scale--Balanced
Numeric Values (Moroney and Krsacok, 2002)*

Descriptor	Mean	SD
Completely acceptable	4.58	0.73
Largely acceptable	3.68	0.71
Reasonably acceptable	2.45	0.74
Slightly acceptable	1.28	0.55
Neither acceptable nor unacceptable (substituted for neutral)	-0.01	0.1
Slightly unacceptable	-1.23	0.65
Pretty unacceptable	-2.7	0.83
Largely unacceptable	-3.71	0.66
Exceptionally unacceptable	-4.62	0.58

Because these scales were based upon the ratings generated by college males and college females, they may not be applicable to older questionnaire respondents, which is the focus of the current study. Additionally, Krsacok (2001) postulates that the 22 years that have elapsed between the Matthews et al. (1978) study and his investigation, combined with possible demographic differences (age, educational level) between the samples, contributed to the differences in mean values reported by college males and U.S. Army personnel. Krsacok did not find significant sex differences within the college sample. Additional possible reasons for response alternative rating differences, such as age differences and the changing nature of language over time, are discussed in the following section.

Possible Reasons for Response Alternative Differences

Demographic Differences

The generalizability of research findings reported in the psychology literature to non-college age individuals is an area of contention. Peterson (2001) performed a

comprehensive study on the effects that demographic differences have on experimental results. He conducted a second-order meta-analysis to assess the implications of using college student subjects compared with non-student subjects in social science research.

Peterson (2001) found that college participants' responses were slightly more homogeneous than non-student participants. Additionally, effect sizes derived from college students differed in size and direction when compared with non-students. The direction of the effects differed 19% between relationships derived from college participants compared with non-student populations. "Thus, in nearly one-of-five relationships studied, a conclusion based on a college student subjects may have differed directionally from one based on non-student subjects."

Peterson (2001) did not find any consistent, systematic patterns to the differences in effect size, directionality, or variability. Therefore, he suggests, "At a minimum, research results based on college students need to be replicated with non-student subjects prior to the generation of universal principles." Finally, Peterson notes that researchers should be encouraged to fully report on the characteristics of their samples so informed judgments can be made regarding the generalizability of their findings.

An earlier study by Moroney and Reising (1992) provided a similar caution against the generalizability of studies when demographic data are not reported in adequate detail. Their study investigated the types of participants commonly used in human factors experiments, but found many studies did not report participant information. Furthermore, Moroney and Reising described performance differences and motivations among different types of study participants: students, company volunteers, non-volunteers, and system operators. The differences among study participants require

researchers and practitioners to consider demographic differences when evaluating the generalizability of the findings.

Bass (1968) found significant differences in responses to a questionnaire between student and non-students. Bass developed the Organizational Success Questionnaire (OSQ) and distributed it to different participant groups (89 graduate business students, 24 night students with 5 years of experience, and 89 upper-middle managers with 20 years of experience). He discovered significant differences between the responses of participant groups for several questionnaire items. Following the initial questionnaire completion, participants attended training sessions in organizational psychology. After the training, the students' attitudes changed more than the managers. Bass' findings not only demonstrated the effect participants' characteristics have on their beliefs, but also the impressionability of students.

While the Bass (1968) study focused on the differences between participant groups relative to beliefs in organization success, Bass et al. (1974) studied different participant pools for the purpose of developing statistically valid response alternatives. As previously described in the Response Alternative Quantitative Analysis Section of this thesis, Bass et al. (1974) studied the sensitivity of response alternatives for important versus unimportant issues. The participants were 175 male and female participants from three populations: night school MBA students, most of who were employed; adult undergraduate students; and high school juniors.

Bass et al. (1974) reported that participants with different demographics consistently assigned similar scale values to expressions of frequency and amount. They state that "... at least, for three samples of judges at different age, education, and

occupational levels, and for important and unimportant issues, that it is possible to fix quantitative meanings that are associated with verbal judgments." The consistency in the participants' scale value ratings provides conflicting findings with Peterson (2001), Moroney and Reising (1992), and Bass (1968) relative to effects of demographic differences.

Time Differences

Simpson (1963) investigated whether the quantitative values of terms changed over time. He replicated his 1944 study which investigated the quantitative values of 20 frequency terms such as generally, occasionally, and seldom. A primary purpose of his investigation was to compare meanings from 1963 with their meanings 20 years ago and elasticity of terms from 1963 (defined as interquartile range) compared to 20 years ago.

The participants were 395 university students drawn from across the United States, but predominately from the Midwest. Considering the sample of students from the 1944 study was completely different from the 1963 study, the similarities between the results were striking. Simpson (1963) found many similarities between the median values reported by participants in 1944 and 1963. In over one-third of the 20 terms, the reported values were identical, and for only one term, sometimes, was the difference greater than five percentage points. "Such strong correspondence would seem to imply a high degree of stability for most of the meaning norms investigated." Simpson also found similarities comparing the elasticity (interquartile ranges) of the terms reported by participants in 1944 and 1963.

Budescu and Wallsten (1985) wanted to determine if the differences in mapping numbers to phrases is primarily due to between subject or within subject factors, such as

variability in the interpretation of phrases over time. They hypothesized that there are large, consistent individual differences between people in ranking non-numerical probability phrases. They had subjects make paired comparisons and rank order probabilities phrases on three separate occasions at three-week intervals.

Budescu and Wallsten (1985) found that while different individuals generated different rank orderings, individuals generated a relatively stable rank ordering over the time period examined. In other words, the differences can be attributed, in part, to between-subject factors, rather than within-subject factors. Additionally, Budescu and Wallsten's list of phrases had 8 words in common with Simpson's 1963 study. The results show consistency of terms over time: "The root mean squared difference between mean values is always under 0.05, the linear correlation is above .99. . ." This finding further supported their hypothesis that there are individual differences between subjects' ratings for probability phrases.

Budescu and Wallsten (1985) also wanted to determine if the individual differences in between subject variations could be grouped, so they performed a cluster analysis to identify small groups with distinct rank orderings. The cluster analysis did not reveal any interpretable pattern of individual difference related to the variations in mapping numbers to phrases. Thus, while their findings support between-subject variations and consistency over time, they could not characterize specific individual differences correlated with the variations.

Other researchers have found likableness and familiarity of response alternatives relatively stable over time. Dumas, Johnson, and Lynch (2002) researched person-descriptive words similar to the list of 555 personality-trait words assembled by

Anderson (1968). Dumas et al. generated a list of 844 person-descriptive words and compared the likableness ratings of the common words in the list established by Anderson. One of the key goals of the Dumas et al. study was to determine if “likeableness ratings might change over time as a function of cultural changes in the meaning attached to some words.”

Participants were 1770 introductory psychology students, who rated these words in terms of likableness and familiarity. Dumas et al. (2002) found the ratings of likableness and favorability significantly correlated ($r=0.939$, $p < 0.0001$ and $r=0.488$, $p < 0.0001$) with the ratings from the Anderson (1968) study. The similar ratings probably reflect “. . . a high degree of agreement in cultural norms and expectations across different samples studied at different times.”

While several studies have demonstrated consistency of quantitative meanings, likeability, and familiarity ratings for terms over decades, the concept of language changing over time remains of interest. Rohrmann (2003) investigated the effects of both demographic and time differences on the subjective interpretation of verbal scale point labels (response alternatives). Preliminary results show no substantial and systematic differences for ratings of the response alternatives between students and non-students. Unfortunately, results comparing response alternative ratings with his earlier study are not available. While several studies point towards the stability in language over time, the limited data are not conclusive.

Current Study

Krsacok and Moroney (2002) postulated that either the time between their study and Matthews et al.'s (1978) study, the demographic differences between samples, or both contributed to the differences in response alternative ratings between college males and U.S. Army personnel. In addition, Peterson (2001), Moroney and Reising (1992), and Bass (1968) have demonstrated differences when comparing student with non-student populations, although they were not testing response alternative quantitative ratings. Conversely, Bass et al. (1974) found that samples from three different populations (working night school MBA students, adult undergraduate students, and high school juniors) generated stable descriptor ratings. Simpson (1963), Dumas et al. (2002), and Krsacok and Moroney found some stability in response alternative ratings among different demographic groups although these studies focused primarily on sex differences. Aside from sex differences, Simpson, Budescu and Wallsten (1985), and Dumas et al. found conflicting results for the stability of response alternative ratings across different participant groups, but stable results on response alternative ratings over time.

Faced with the disparate findings in the literature, this thesis examined numerical ratings assigned to response alternatives by working age (20-65 years of age) males and females from a variety of age, educational, and occupational groups and contrasts them with data from U.S. Army and college age samples.

The objectives of the current study are to:

1. Determine if the differences in response alternative ratings reported by

Krsacok and Moroney (2002) exist when comparing US Army personnel with

working age males, and if the differences exist when comparing college males and females with working age males and females.

2. Determine if the consistency across sex found by Krsacok and Moroney exists when comparing males and females of a working age population.
3. Determine if differences in mean response alternative ratings exist for different groups of the working age population segmented by occupation level, age, and education level.
4. Determine if the order of descriptors generated by a working age population is consistent with the orders of descriptors generated by both college students and US Army personnel.
5. Determine if there is a tendency for college students (Krsacok and Moroney, 2002) or working age personnel to generate more extreme mean ratings, as well as more positive ratings.

If significant differences are found for response alternative ratings generated by a working age population compared with the college age population, sets of equidistant response alternatives will be created for acceptability, adequacy, and relative goodness. These scales will be useful for questionnaire developers analyzing a working age population.

While the current study is not a longitudinal study which would examine the differences in ratings of response alternatives over time within the same sample, the results should clarify the contribution of subject factors (sex, age, education level) to response alternative rating differences as well as provide additional evidence on the stability of response alternative ratings.

CHAPTER II

METHOD

Participants completed a web-based questionnaire. The questionnaire, invitations letters, and thank you letters were compiled according to Dillman's recommendations (2000). Specifically, the design of the questionnaire materials and procedure paid attention to the principles of social exchange rewards by establishing trust, ensuring sound visual layout/design, and knowledge of the targeted population. Carefully timed introduction letters were distributed by trusted authority figures, as well as the questionnaire administrator. Reminder letters were sent one week after the initial questionnaire invitation, and a thank you letter was distributed after questionnaire completion.

Apparatus

The response alternative lists developed by Krsacok (2001) were replicated. The informed consent form, subject questions, questionnaire instructions, practice questions, response alternative lists, and debriefing (see Appendices A-I) were hosted on Questionpro.com. In addition, Questionpro.com was used to construct the on-line version of the questionnaire materials, host the materials, collect and store the raw data, and manage the distribution of the questionnaire. The questionnaire consisted of three lists of descriptors for acceptability, adequacy, and relative goodness. The presentation order of the three lists of response alternatives was randomized using the randomization

feature of Questionpro.com; the response alternatives within each list were also randomized.

Krsacok (2001) created his paper and pencil descriptor lists with the constraint that descriptors such as “highly acceptable” and “highly unacceptable” were not listed adjacent to each other. Because a simple randomization of the response alternative lists would not reduce the chances of these similar descriptors appearing adjacent to each other, four separate groups within each list were created. The response alternatives were distributed between the four groups to prevent similar response alternatives from appearing adjacent to each other when these groups were randomized.

The data were stored on a secure website protected by a username and password. Data were also downloaded to the investigator’s computer, which was protected by username and password.

Participants

The total participant pool for this study consisted of 1182 employees from MITRE’s Center for Air Force Command and Control Systems. Participants volunteered their own time and did not receive any chargeable project time for their participation. Completed responses were gathered from 449 participants. An elimination procedure described in the following Results section further reduced the number of participants to 206. This final participant set was composed of 137 males and 69 females with a median age range of 43-47. The distribution of participants by age and sex can be seen in Figure 2.

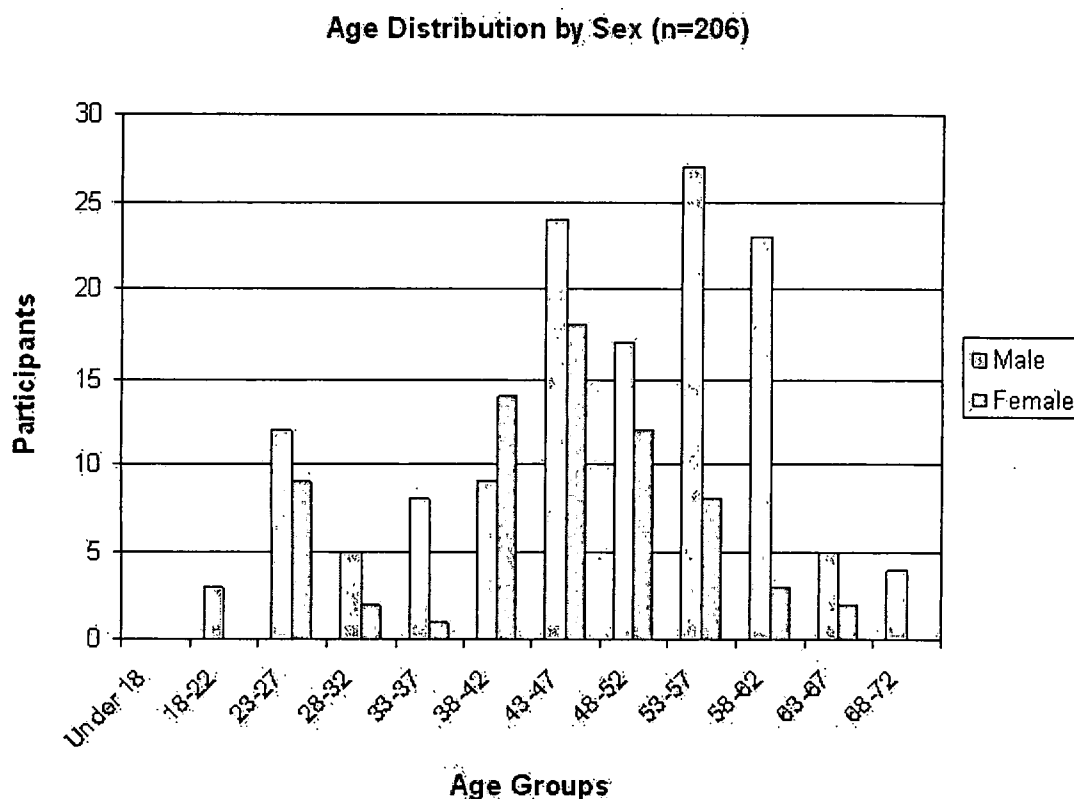


Figure 2. Participant age distribution by sex

Procedure

The Chief Engineer of the Information Technologies Directorate invited employees to partake in the study via an email invitation (Appendix A). Participants were informed that upon completion of the questionnaire, they were entered in the random drawing for a \$25, \$50, and \$100 Gift Card which was acceptable at any store in a local mall. Participants received a follow-up invitation (Appendix A) from the questionnaire administrator with a link to the web-based questionnaire, see Table 12 for order of participant communications.

Table 12. Questionnaire Events

Questionnaire Event	Date
Pre-invitation Letter	Feb 27, 2006
Invitation Letter (data collection begins)	March 1, 2006
Reminder Letter	March 13, 2006
Data Collection Ends	March 15, 2006
Debrief and raffle winners announcement	March 17, 2006

After participants directed their web browser to the questionnaire URL, they completed the Informed Consent Page (Appendix B), which required the participants to “sign” the form with their email address. Participants then entered responses (Appendix C) to basic subject questions regarding sex, age, MITRE job level, and education level. The Instruction Page (Appendix D) was presented next, followed by the Practice Questionnaire (Appendix E). The Practice Questionnaire required the participants to rate several example response alternatives in terms of favorableness/unfavorableness. Participants rated their subjective feelings of favorableness/unfavorableness towards the response alternatives on an eleven-point scale ranging from -5 to +5, with -5 being the most unfavorable rating and +5 being the most favorable.

The participants then completed the randomized lists of descriptors (acceptability (Appendix F), adequacy (Appendix G), and relative goodness (Appendix H)). As previously stated, the order of the lists were also randomized to prevent learning effects.

When the participants completed all three lists, they were thanked for their participation and presented with the questionnaire debriefing (Appendix I). The debriefing informed the participants that if they had any questions they could contact the questionnaire administrators, UD Ethics Committee Chair, or others.

CHAPTER III

RESULTS

The results of this study are described in the following three sections: Descriptive Statistics, Intrasubject Response Consistency, and Group Comparisons. The Descriptive Statistics section reports the means and standard deviations for ratings of acceptability, adequacy, and relative goodness as reported by working age males and females. The intrasubject consistency of ratings was performed to evaluate the consistence of values assigned to the repeated response alternatives. Group comparisons were performed to detect significant differences in response alternative ratings between the US Army (Matthews et al., 1974) and working age males, college males (Krsacok, 2001) and working age males, working age males and working age females, different age groups, and groups with different education levels.

Before the analyses were conducted, the data were evaluated to determine if any individual ratings were reversed from the group mean, indicating a possible "sign error", e.g. rating extremely unacceptable a +5. If a participant provided 4 or more responses with possible sign errors, their data were not included. For the remaining questionnaire responses, sign errors were left in the data because it was difficult to determine if ratings close to zero were sign errors or a normal variation in responses; for example rating "barely acceptable" as -1 or labeling "slightly unacceptable" as +1. Finally, data from the eight participants who responded with more than 10 ratings of zero when the mean rating

for that particular response alternative was positive or negative, were excluded: since they demonstrated a lack of attention to detail.

These elimination procedures were necessary because some respondents either did not understand the instructions or mislabeled many of the descriptors. Forty-seven participants responded with more than 15 sign errors and were sent a revised invitation, (Appendix A). Data from 165 males and 78 females were classified as invalid and excluded from the data. After all incomplete and invalid data were removed, 206 participants' data sets remained (137 males and 69 females).

For each group comparison, data were randomly selected from the pool of 206 complete and valid responses. For data divided by sex, 54 male and 54 female responses were randomly selected because this is the same number of data sets evaluated by Krsacok (2001). By using the same number of response sets, comparisons between working age participants' responses and college participants' responses were more resistant to problems encountered with unequal sample sizes. The data for other group comparisons were randomly selected to ensure an equal number of participant responses in each group, for similar reasons of robustness. The specific number of responses in each group is provided in each of the following sections.

Descriptive Statistics

This section provides a summary of the questionnaire descriptive statistics. Male working age data were treated separately from female working age data because later analysis compare these two groups to determine if the ratings provided by males and females are different.

Working Age Male Participants

The means and standard deviations for acceptability ratings generated by 54 randomly selected male participants are shown on the left side of Table 13. The means and standard deviations for adequacy and relative goodness can be seen in Appendix J. An examination of Table 13 reveals standard deviations ranging from 0.19 (Neutral) to 2.73 (Extremely acceptable). As shown in Table J-1, standard deviations for adequacy responses range from 0.00 (neutral) to 2.02 (absolutely adequate), while standard deviations for relative goodness (Table J-2) responses range from 0.00 (the same) to 1.57 (undoubtedly best). The low standard deviation for Neutral indicates a high level of agreement among respondents on the meaning or intensity of the response alternative.

Working Age Female Participants

The means and standard deviations for the ratings of 54 randomly selected female participants are provided in Table 13 for the acceptability list and Appendix J for the adequacy and goodness lists. As can be seen from an examination of Table 13, for the acceptability response alternatives, standard deviations range from 0.00 (neutral) to 1.94 (largely acceptable). As shown in Table J-1, standard deviations for adequacy responses range from 0.00 (neutral) to 2.07 (completely adequate). Table J-2 illustrates similar differences in standard deviations for relative goodness responses ranging from 0.00 (the same) to 2.06 (absolutely alike). A standard deviation of 0.00 indicates all participants rated Neutral the same value on the -5 to +5 scale. Response alternatives with large standard deviations imply the meaning is ambiguous and may not be appropriate to use on a rating scale.

Table 13. Working age female and male means and standard deviations arranged in descending order of acceptability

Descriptors	WA Males			WA Females		
	Mean	SD	N	Mean	SD	N
Completely acceptable	4.26	1.48	54	4.33	1.50	54
Fully acceptable	4.15	0.90	54	4.11	0.96	54
Very very acceptable	4.06	1.45	54	4.41	0.74	54
Wholly acceptable	4.00	0.99	54	4.06	1.47	54
Highly acceptable	3.85	1.14	54	4.04	1.29	54
Most acceptable	3.76	1.34	54	3.72	1.47	54
Extremely acceptable	3.61	2.73	54	4.48	1.28	54
Quite acceptable	2.87	1.29	54	3.19	1.12	54
Acceptable	2.63	1.25	54	2.33	1.21	54
Largely acceptable	2.46	1.90	54	2.87	1.94	54
Pretty acceptable	2.39	0.66	54	2.52	0.69	54
Reasonably acceptable	2.24	0.73	54	2.24	1.11	54
Rather acceptable	2.22	1.19	54	2.37	0.90	54
Moderately acceptable	2.04	1.16	54	2.43	0.60	54
Fairly acceptable	1.94	0.68	54	1.91	0.98	54
Mildly acceptable	1.46	0.61	54	1.41	0.69	54
Somewhat acceptable	1.33	0.73	54	1.35	1.05	54
Mildly acceptable	1.31	0.99	54	1.35	0.59	54
Sort of acceptable	1.09	0.59	54	1.06	0.63	54
Slightly acceptable	1.02	0.57	54	1.20	0.41	54
Barely acceptable	0.80	0.59	54	0.89	0.84	54
Neutral	-0.04	0.19	54	0.00	0.00	54
Borderline	-0.13	0.70	54	-0.07	0.38	54
Marginal	-0.31	0.97	54	-0.17	0.64	54
Barely unacceptable	-0.98	0.49	54	-1.06	0.68	54
Slightly unacceptable	-1.19	0.39	54	-1.20	0.63	54
Somewhat unacceptable	-1.69	0.91	54	-1.80	0.74	54
Fairly unacceptable	-2.22	0.66	54	-2.39	0.86	54
Rather unacceptable	-2.39	0.86	54	-2.54	1.00	54
Moderately unacceptable	-2.44	0.69	54	-2.35	1.07	54
Reasonably unacceptable	-2.48	0.93	54	-2.59	0.81	54
Pretty unacceptable	-2.78	1.11	54	-2.83	0.72	54
Notably unacceptable	-3.24	0.93	54	-3.19	0.87	54
Quite unacceptable	-3.30	1.09	54	-3.50	1.08	54
Unacceptable	-3.43	1.13	54	-3.17	1.37	54
Largely unacceptable	-3.57	0.63	54	-3.89	0.63	54
Substantially unacceptable	-3.57	0.72	54	-3.93	0.77	54
Considerably unacceptable	-3.59	0.77	54	-3.56	1.25	54
Decidedly unacceptable	-3.70	1.37	54	-3.52	1.27	54
Highly unacceptable	-4.09	0.52	54	-4.43	1.27	54
Highly unacceptable	-4.17	0.54	54	-4.52	0.54	54
Most unacceptable	-4.24	0.82	54	-4.33	0.82	54
Wholly unacceptable	-4.43	1.44	54	-4.63	1.32	54
Very very unacceptable	-4.48	0.57	54	-4.61	0.56	54
Exceptionally unacceptable	-4.59	0.60	54	-4.78	0.50	54
Completely unacceptable	-4.72	0.60	54	-4.98	0.14	54
Extremely unacceptable	-4.74	0.48	54	-4.87	0.34	54
Absolutely unacceptable	-4.91	0.29	54	-5.00	0.00	54
Entirely unacceptable	-4.91	0.29	54	-5.00	0.00	54
Totally unacceptable	-4.91	0.35	54	-4.96	0.19	54

Intrasubject Response Consistency

Similar to the Matthews et al. (1978) and Krsacok (2001) study, several response alternatives were repeated within and between acceptability, adequacy, and relative goodness lists to evaluate respondent consistency. Parallel to the descriptive statistics, the male and female data were separated. Table 14 shows intrasubject response consistency for means and standard deviations generated by working age males.

Table 14. Intrasubject response consistency for working age males

	Within List Means (SDs)		Across Lists Means (SDs)		
	1st rating	2nd rating	Acceptability	Adequacy	Goodness
Mildly acceptable	1.31 (.99)	1.46 (.61)	--	--	--
Highly unacceptable	-4.09 (.52)	-4.17 (.54)	--	--	--
Exceptionally inadequate	-4.54 (.64)	-4.52 (.57)	--	--	--
Neutral	--	--	-0.04 (.19)	0.00 (.00)	-0.04 (.19)
Borderline	--	--	-0.13 (.70)	-0.11 (.57)	-0.19 (.70)
Marginal	---	--	-0.31 (.97)	--	-0.17 (.69)

Table 15 shows the intrasubject response consistency for means and standard deviations generated by working age females. Both Table 14 and Table 15 show a high degree of consistency for the response alternatives repeated within and across lists.

Table 15. Intrasubject response consistency for working age females

	Within List Means (SDs)		Across Lists Means (SDs)		
	1st rating	2nd rating	Acceptability	Adequacy	Goodness
Mildly acceptable	1.41 (.69)	1.35 (.59)	--	--	--
Highly unacceptable	-4.52 (.54)	-4.43 (1.27)	--	--	--
Exceptionally inadequate	-4.80 (.45)	-4.89 (.32)	--	--	--
Neutral	--	--	0.00 (.00)	0.00 (.00)	0.02 (.14)
Borderline	--	--	-0.07 (.38)	-0.09 (.52)	-0.07 (.38)
Marginal	---	--	-0.17 (.64)		-0.20 (.68)

Generally, most means for repeated response alternatives differed by less than 0.10, and differences in standard deviations were also minimal. The large difference in standard deviations for working age females' first and second ratings for "highly unacceptable" can be attributed to a sign reversal, where one participant produced a rating of +4 whereas most other participants produced ratings of -4 and -5. The ratings generated by working age males and females illustrate a satisfactory degree of consistency for repeated response alternatives within and across lists of acceptability, adequacy, and relative goodness.

T-tests were performed to locate any statistically significant differences between the first and second ratings for repeated response alternatives. Table 16 shows the means, standard deviations, and *t* test results for ratings generated by working age males and working age females.

*Table 16. Differences in intrasubject response consistency descriptors—
working age males and females*

Descriptor	WA Males 1st Rating			WA Males 2nd Rating			Diff		Diff	t	t _{PROB}
	Mean	SD	N	Mean	SD	N	Mean	SD			
Mildly acceptable	1.31	0.99	54	1.46	0.61	54	0.15	0.38	-1.18	0.24	
Highly unacceptable	-4.09	0.52	54	-4.17	0.54	54	0.08	0.02	0.94	0.35	
Exceptionally inadequate											
	-4.54	0.64	54	-4.52	0.57	54	0.02	0.07	-0.23	0.82	
	WA Females 1st Rating			WA Females 2nd Rating							
	Mean	SD	N	Mean	SD	N					
Mildly acceptable	1.41	0.69	54	1.35	0.59	54	0.06	0.10	0.54	0.59	
Highly unacceptable	-4.52	0.54	54	-4.43	1.27	54	0.09	0.73	-0.54	0.59	
Exceptionally inadequate	-4.80	0.45	54	-4.89	0.32	54	0.09	0.13	1.40	0.17	

As shown in Table 16 there were no significant differences between repeated response alternative ratings for neither working age males nor working age females.

The consistency of the first and second ratings for “high unacceptable” is graphically represented in Figure 3 and Figure 4. Figure 3 shows that the distributions of the ratings generated by working age males are remarkably similar across the first and second ratings.

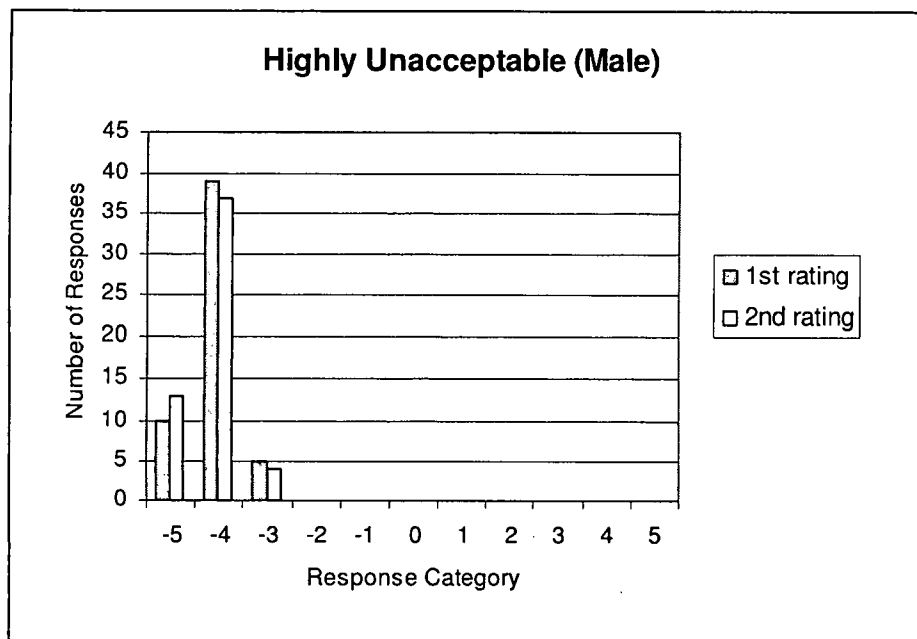


Figure 3. Response distributions of working age males for "highly unacceptable"

The distributions of the ratings generated by working age females are also similar across the first and second ratings (see Figure 4). Figure 4 also shows one rating of +4 for "highly unacceptable", whereas the majority of the responses are either -5 or -4. The large standard deviation for the second rating of "highly unacceptable" shown in Table 15 is for the most part due to a single rating of +4 (probably a sign error).

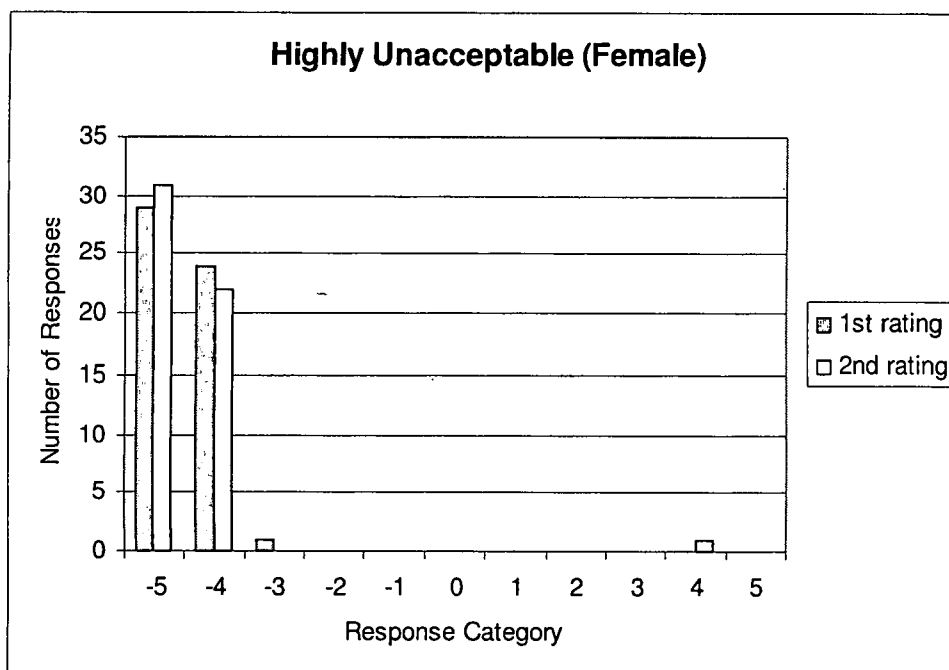


Figure 4. Response distributions of working age females for "highly unacceptable"

Because the data elimination procedures did not eliminate all sign errors (the participants' questionnaire was eliminated only if they generated more than three sign errors) some standard deviations appear large. The distribution graphs for working age male and female ratings of "mildly acceptable" and "exceptionally inadequate" are provided in Appendix K.

Group Comparisons

The data from the working age sample in the current study were compared with the data from Matthews et al. (1978) and Krsacok (2001). Ratings from working age males were compared with data from the Army personnel test group using *t* tests to determine if there were significant differences between the response sets. Ratings from working age males were also compared with data from college males (Krsacok, 2001)

using t tests. The data from the working age females were compared with the data from the college female test group (Krsacok, 2001). Furthermore, ratings from working age personnel as a whole were compared with data from college students (Krsacok, 2001).

The data from subgroups within the working age sample were compared. The data analyzed for significant differences included subgroups divided by sex, age, education level, and occupation level. Specifically, t -tests were used to determine if significant differences existed between data from male and female working age participants. The data from working age technical staff and managers were also compared. Data from working age participants segmented by age groups and education level were compared using ANOVAs because there were more than two subgroups.

Comparison of Ratings by Working Age Males and US Army Personnel

Mean rating differences. Before conducting t -tests, an F_{MAX} value was calculated for each response alternative to determine the homogeneity of variance. If the variance was homogeneous (indicated by non-significant F_{CRIT} values), the variances were pooled to calculate the t value. If the variance was heterogeneous (as indicated by significant F_{CRIT} values), the variances were kept separate when $t_{UNPOOLED}$ was calculated. This procedure was repeated for all the other group and subgroup t -test analyses.

Calculation of the t -values revealed significant differences between 24% of the working age males and US Army personnel responses (12 out of 50 response alternatives) on the acceptability list, 16% of the responses (8 out of the 50 response alternatives) on the adequacy list, and 15% of the responses (6 out of 41 response alternatives) on the goodness list. Table 17 shows the results of the t tests for working age males and US Army personnel on the acceptability list. The results are sorted in

descending order based upon working age males. The results of t tests for working age males and US Army personnel on the adequacy and goodness lists can be found in Appendix L.

After the t -tests revealed significant differences in response alternatives generated by working age males and US Army personnel, the next step was to determine if the number of significant differences in mean values was beyond chance. A Chi-square analysis was performed and the probabilities were calculated based on the number of significant t_{PROB} values.

Table 17. Comparison of the acceptability response alternative values for working age males and US Army Personnel

Descriptors	WA Males			US Army Males			Diff*	t	t _{PROB}	Sig
	Mean	SD	N	Mean	SD	N				
Completely acceptable	4.26	1.48	54	4.69	0.61	51	0.43	1.97	0.053	
Fully acceptable	4.15	0.90	54	4.41	0.87	51	0.26	1.50	0.136	
Very very acceptable	4.06	1.45	54	4.16	0.83	51	0.10	0.44	0.663	
Wholly acceptable	4.00	0.99	54	4.73	0.56	51	0.73	4.68	0.000	X
Highly acceptable	3.85	1.14	54	4.04	0.63	50	0.19	1.06	0.291	
Most acceptable	3.76	1.34	54	4.16	0.92	51	0.40	1.79	0.076	
Extremely acceptable	3.61	2.73	54	4.39	0.72	51	0.78	2.03	0.047	X
Quite acceptable	2.87	1.29	54	3.22	0.96	51	0.35	1.57	0.120	
Acceptable	2.63	1.25	54	2.39	1.46	51	0.24	0.91	0.367	
Largely acceptable	2.46	1.90	54	3.14	0.99	51	0.68	2.32	0.023	X
Pretty acceptable	2.39	0.66	54	2.00	1.13	49	0.39	2.11	0.038	X
Reasonably acceptable	2.24	0.73	54	2.29	0.72	51	0.05	0.35	0.725	
Rather acceptable	2.22	1.19	54	1.94	0.82	49	0.28	1.40	0.165	
Moderately acceptable	2.04	1.16	54	2.28	0.72	50	0.24	1.28	0.205	
Fairly acceptable	1.94	0.68	54	1.84	0.92	50	0.10	0.63	0.528	
Mildly acceptable	1.46	0.61	54	1.80	0.95	51	0.34	2.17	0.033	X
Somewhat acceptable	1.33	0.73	54	1.46	1.24	48	0.13	0.64	0.527	
Mildly acceptable	1.31	0.99	54	1.69	0.70	51	0.38	2.26	0.026	X
Sort of acceptable	1.09	0.59	54	0.94	0.65	50	0.15	1.23	0.220	
Slightly acceptable	1.02	0.57	54	1.04	0.52	51	0.02	0.19	0.852	
Barely acceptable	0.80	0.59	54	1.08	0.52	51	0.28	2.57	0.011	X
Neutral	-0.04	0.19	54	0.00	0.00	51	0.04	1.50	0.136	
Borderline	-0.13	0.70	54	0.00	0.20	50	0.13	1.31	0.196	
Marginal	-0.31	0.97	54	-0.12	0.52	50	0.19	1.26	0.212	
Barely unacceptable	-0.98	0.49	54	-1.10	0.30	50	0.12	1.52	0.132	
Slightly unacceptable	-1.19	0.39	54	-1.26	0.59	51	0.07	0.71	0.478	
Somewhat unacceptable	-1.69	0.91	54	-1.77	0.67	51	0.08	0.51	0.611	
Fairly unacceptable	-2.22	0.66	54	-2.16	0.88	50	0.06	0.40	0.694	
Rather unacceptable	-2.39	0.86	54	-2.02	0.84	50	0.37	2.22	0.029	X
Moderately unacceptable	-2.44	0.69	54	-2.34	0.68	50	0.10	0.74	0.459	
Reasonably unacceptable	-2.48	0.93	54	-2.44	0.75	50	0.04	0.24	0.811	
Pretty unacceptable	-2.78	1.11	54	-2.41	0.66	51	0.37	2.09	0.040	X
Notably unacceptable	-3.24	0.93	54	-3.50	1.04	50	0.26	1.35	0.181	
Quite unacceptable	-3.30	1.09	54	-3.39	1.07	49	0.09	0.42	0.674	
Unacceptable	-3.43	1.13	54	-2.67	1.38	51	0.76	3.10	0.003	X
Substantially unacceptable	-3.57	0.72	54	-3.24	0.90	51	0.33	2.08	0.040	X
Largely unacceptable	-3.57	0.63	54	-3.39	0.82	51	0.18	1.27	0.209	
Considerably unacceptable	-3.59	0.77	54	-3.44	0.78	50	0.15	0.99	0.326	
Decidedly unacceptable	-3.70	1.37	54	-3.84	1.02	49	0.14	0.58	0.561	
Highly unacceptable	-4.09	0.52	54	-4.22	0.58	50	0.13	1.21	0.231	
Highly unacceptable	-4.17	0.54	54	-4.29	0.54	51	0.12	1.14	0.258	
Most unacceptable	-4.24	0.82	54	-4.42	0.72	50	0.18	1.19	0.239	
Wholly unacceptable	-4.43	1.44	54	-4.92	0.27	51	0.49	2.46	0.017	X
Very very unacceptable	-4.48	0.57	54	-4.49	0.50	51	0.01	0.10	0.924	
Exceptionally unacceptable	-4.59	0.60	54	-4.54	0.61	50	0.05	0.42	0.674	
Completely unacceptable	-4.72	0.60	54	-4.90	0.36	50	0.18	1.87	0.065	
Extremely unacceptable	-4.74	0.48	54	-4.69	0.46	51	0.05	0.54	0.587	
Totally unacceptable	-4.91	0.35	54	-4.94	0.24	51	0.03	0.51	0.608	
Absolutely unacceptable	-4.91	0.29	54	-4.92	0.33	51	0.01	0.17	0.869	
Entirely unacceptable	-4.91	0.29	54	-4.90	0.36	50	0.01	0.16	0.876	

*Absolute value of the difference. X: significant <.05

As shown in Table 18, the Chi-square probabilities revealed significant differences between acceptability response alternatives generated by working age males and US Army personnel. The number of differences in ratings can not be attributed simply to chance. However, the number of significant differences for ratings of adequacy and relative goodness cannot be attributed to factors beyond chance.

Table 18. Summary of significant t_{PROB} values and Chi-square probabilities for working age males and US Army personnel*

	Acceptability	Adequacy	Goodness
Working age males and US Army personnel	12/50 (.007)	8/50 (.073)	6/41 (.143)

* Probabilities from Chi square calculations in parentheses

Variability differences. To determine if variability differences existed for ratings provided by working age males and US Army personnel, the F_{MAX} values from the previous section were evaluated. The evaluation revealed 20 significant F_{MAX} values for the acceptability list, 12 significant values for the adequacy list, and 16 significant values for the relative goodness list ($F_{CRIT}(2,53) = 2.07, p=.05$), see Appendix M.

A Chi-square analysis was performed (Table 19) to determine if the number of significant F_{MAX} values was above chance. The analysis revealed a significant number of differences in the variability of responses provided by working age males and US Army personnel on all three lists of response alternatives.

Table 19: Distribution of significant F_{MAX} values and associated Chi-square probabilities for working age males and US Army personnel*

	Acceptability	Adequacy	Goodness
Working age males and US Army personnel	20/50 (.001)	12/50 (.007)	16/41 (.001)

*Probabilities from Chi square calculations in parentheses

Descriptor order. To determine if the order of the means generated by the working age males and US Army personnel were consistent, the mean values were plotted and correlations calculated. Figure 5 depicts the mean values assigned by working age males and US Army personnel for response alternatives of acceptability. The means calculated from working age males are plotted on the abscissa. The means calculated from US Army personnel data are plotted in ascending order on the ordinate. Appendix N contains plots of the bivariate distributions and correlations for the adequacy and relative goodness data.

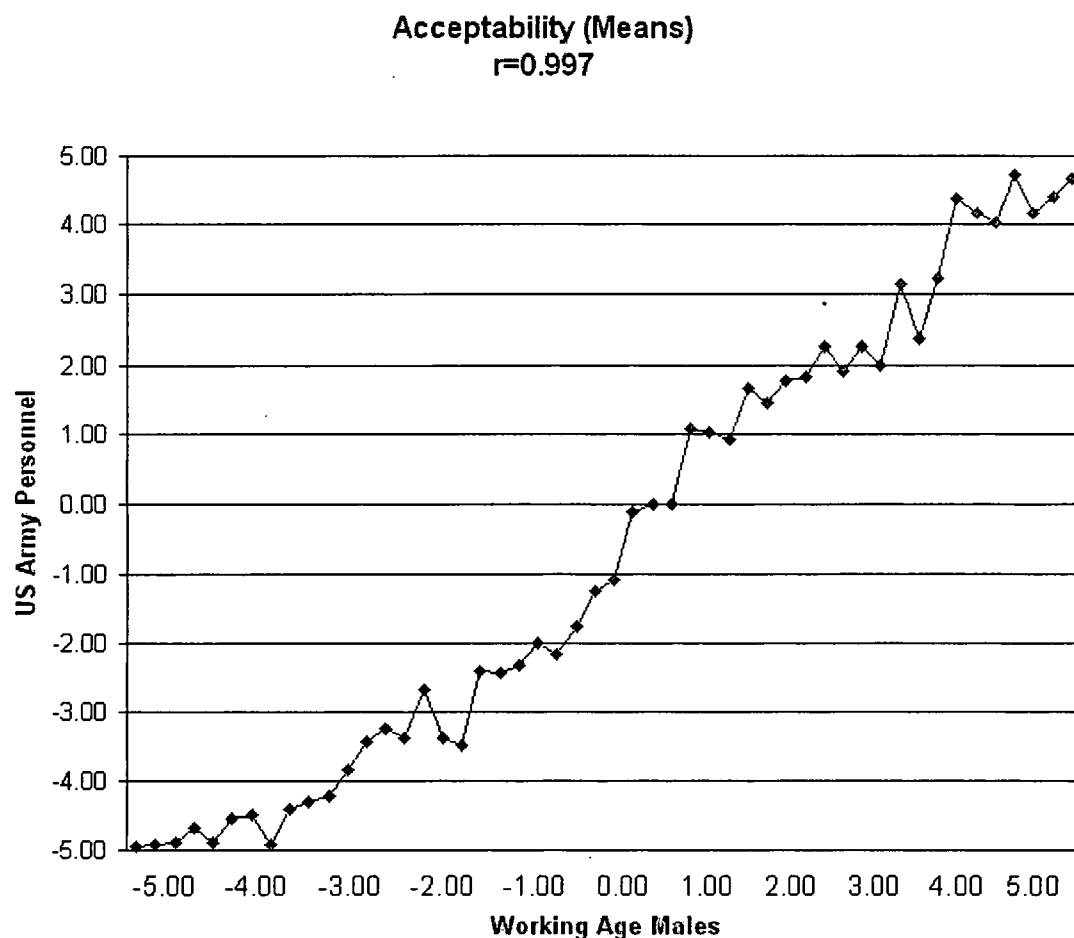


Figure 5: Bivariate distribution of mean values for acceptability response alternatives -- Working age males and US Army personnel

The order of mean values generated by working age males and US Army personnel for response alternatives of acceptability, adequacy, and relative goodness were very similar as indicated by the high correlations between the means, which were 0.997, 0.997, and 0.998, respectively.

Comparison of Ratings by Working Age Males and College Males

Mean rating differences. Calculation of the *t*-values revealed significant differences between 28% of the working age males and college males responses (14 out

of 50 response alternatives) on the acceptability list, 26% of the responses (13 out of the 50 response alternatives) on the adequacy list, and 37% of the responses (15 out of 41 response alternatives) on the goodness list. Table 20 shows the results of the t tests for working age males and college males on the acceptability list. The results are sorted in descending order based upon the values assigned by the working age males. The results of t tests for working age males and college males on the adequacy and goodness lists can be found in Appendix O.

After the t -tests revealed significant differences in response alternatives generated by working age males and college males, the next step was to determine if the number of significant differences in mean values was beyond chance. A Chi-square analysis was performed and the probabilities calculated based on the number of significant t_{PROB} values.

Table 20: Comparison of the acceptability response alternative values for working age males and college males

Descriptors	WA Males			College Males			Diff*	t	t _{PROB}	Sig
	Mean	SD	N	Mean	SD	N				
Completely acceptable	4.26	1.48	54	4.59	0.74	54	0.33	1.47	0.147	
Fully acceptable	4.15	0.90	54	4.5	0.72	54	0.35	2.23	0.028	X
Very very acceptable	4.06	1.45	54	4.41	0.84	54	0.35	1.53	0.129	
Wholly acceptable	4.00	0.99	54	4.35	0.78	53	0.35	2.03	0.045	X
Highly acceptable	3.85	1.14	54	4.09	0.49	54	0.24	1.42	0.160	
Most acceptable	3.76	1.34	54	4.17	0.82	54	0.41	1.92	0.058	
Extremely acceptable	3.61	2.73	54	4.51	0.54	54	0.90	2.38	0.021	X
Quite acceptable	2.87	1.29	54	3.11	0.95	54	0.24	1.10	0.273	
Acceptable	2.63	1.25	54	2.2	1.07	54	0.43	1.92	0.058	
Largely acceptable	2.46	1.90	54	3.61	0.72	53	1.15	4.15	0.000	X
Pretty acceptable	2.39	0.66	54	2.48	0.73	54	0.09	0.67	0.503	
Reasonably acceptable	2.24	0.73	54	2.44	0.72	54	0.20	1.43	0.155	
Rather acceptable	2.22	1.19	54	2.19	0.74	54	0.03	0.16	0.875	
Moderately acceptable	2.04	1.16	54	2.26	0.68	54	0.22	1.20	0.233	
Fairly acceptable	1.94	0.68	54	2.07	0.75	53	0.13	0.94	0.350	
Mildly acceptable	1.46	0.61	54	1.87	0.75	54	0.41	3.12	0.002	X
Somewhat acceptable	1.33	0.73	54	1.7	0.57	54	0.37	2.94	0.004	X
Mildly acceptable	1.31	0.99	54	1.82	0.69	53	0.51	3.09	0.003	X
Sort of acceptable	1.09	0.59	54	1.06	0.63	53	0.03	0.25	0.800	
Slightly acceptable	1.02	0.57	54	1.23	0.51	53	0.21	2.01	0.047	X
Barely acceptable	0.80	0.59	54	0.58	1.09	54	0.22	1.30	0.196	
Neutral	-0.04	0.19	54	0	0	54	0.04	1.54	0.125	
Borderline	-0.13	0.70	54	-0.06	0.41	54	0.07	0.63	0.528	
Marginal	-0.31	0.97	54	0.06	0.45	54	0.37	2.54	0.013	X
Barely unacceptable	-0.98	0.49	54	-1.06	0.24	53	0.08	1.08	0.286	
Slightly unacceptable	-1.19	0.39	54	-1.22	0.63	54	0.03	0.30	0.767	
Somewhat unacceptable	-1.69	0.91	54	-1.94	0.71	54	0.25	1.59	0.114	
Fairly unacceptable	-2.22	0.66	54	-2.13	0.73	53	0.09	0.67	0.505	
Rather unacceptable	-2.39	0.86	54	-2.43	0.79	54	0.04	0.25	0.802	
Moderately unacceptable	-2.44	0.69	54	-2.17	0.64	54	0.27	2.11	0.037	X
Reasonably unacceptable	-2.48	0.93	54	-2.25	0.76	54	0.23	1.41	0.162	
Pretty unacceptable	-2.78	1.11	54	-2.75	0.78	54	0.03	0.16	0.871	
Notably unacceptable	-3.24	0.93	54	-2.88	0.94	53	0.36	1.99	0.049	X
Quite unacceptable	-3.30	1.09	54	-3.21	0.74	54	0.09	0.50	0.617	
Unacceptable	-3.43	1.13	54	-2.3	1.16	53	1.13	5.10	0.000	X
Substantially unacceptable	-3.57	0.72	54	-3.27	0.95	54	0.30	1.85	0.067	
Largely unacceptable	-3.57	0.63	54	-3.61	0.6	54	0.04	0.34	0.736	
Considerably unacceptable	-3.59	0.77	54	-3.02	0.92	54	0.57	3.49	0.001	X
Decidedly unacceptable	-3.70	1.37	54	-2.96	1.16	54	0.74	3.03	0.003	X
Highly unacceptable	-4.09	0.52	54	-4.15	0.56	54	0.06	0.58	0.565	
Highly unacceptable	-4.17	0.54	54	-4.17	0.5	54	0.00	0.00	1.000	
Most unacceptable	-4.24	0.82	54	-4.42	0.75	54	0.18	1.19	0.237	
Wholly unacceptable	-4.43	1.44	54	-4.44	0.82	53	0.01	0.04	0.965	
Very very unacceptable	-4.48	0.57	54	-4.67	0.55	54	0.19	1.76	0.081	
Exceptionally unacceptable	-4.59	0.60	54	-4.58	0.57	54	0.01	0.09	0.929	
Completely unacceptable	-4.72	0.60	54	-4.74	0.48	54	0.02	0.19	0.849	
Extremely unacceptable	-4.74	0.48	54	-4.74	0.56	54	0.00	0.00	1.000	
Totally unacceptable	-4.91	0.35	54	-4.77	0.42	54	0.14	1.88	0.063	
Absolutely unacceptable	-4.91	0.29	54	-4.93	0.26	54	0.02	0.38	0.707	
Entirely unacceptable	-4.91	0.29	54	-4.81	0.52	54	0.10	1.23	0.221	

*Absolute value of the difference. X: significant <0.05

The significant t_{PROB} values and Chi-square probabilities for working age males and college males are summarized in Table 21.

Table 21. Summary of significant t_{PROB} values and Chi-square probabilities for working age males and college males*

	Acceptability	Adequacy	Goodness
Working age males and college males	14/50 (.002)	13/50 (.004)	15/41 (.001)

* Probabilities from Chi square calculations in parentheses

As shown in Table 21, the Chi-square probabilities revealed the significant differences between ratings generated by working age males and college males. The number of differences in ratings of acceptability, adequacy, and relative goodness response alternatives cannot be attributed simply to chance.

To ensure the significant differences in mean ratings generated by working age males and college males was not due to sampling error, several samples of 54 working age male response sets were randomly selected from the total 137 valid working age male responses. As described in the section entitled Working Age Male Participants, the first draw was a random selection of 54 response sets. The second draw was randomly chosen from the 83 remaining responses, after response sets used in the first draw were eliminated. The third draw included the 29 working age male response sets not included in a previous draw and a random selection from the other 108 response sets. The fourth draw was a random selection from the total 137 valid response sets. This draw procedure ensured that every valid working age male response set was used at least once in the analysis.

As shown in Table 22 the number of significant differences in mean ratings for acceptability generated by working age males and college males remains at a significant level across the four different draws. The number of significant mean differences ranged from 11 to 19. The distribution of differences reveals consistency between the different sample draws with 11 of the acceptability response alternatives receiving a significant number of different mean ratings on at least three of the four sample draws. Table 23 and Table 24 illustrate similar patterns with the number of significant differences ranging from 13 to 20 for the multiple draws of adequacy and relative goodness. While this technique was used to ensure the differences were not due to sampling error, the subsequent analyses were based on the first draw.

Table 22. Significant acceptability mean differences generated by working age males and college males across several sample draws

Descriptors	Draw 1	Draw 2	Draw 3	Draw 4	Total # of sig draws
Absolutely unacceptable					0
Acceptable		X	X		2
Barely acceptable					0
Barely unacceptable					0
Borderline				X	1
Completely acceptable					0
Completely unacceptable					0
Considerably unacceptable	X	X	X	X	4
Decidedly unacceptable	X	X	X	X	4
Entirely unacceptable					0
Exceptionally unacceptable					0
Extremely acceptable	X			X	2
Extremely unacceptable					0
Fairly acceptable					0
Fairly unacceptable					0
Fully acceptable	X		X	X	3
Highly acceptable					0
Highly unacceptable					0
Highly unacceptable					0
Largely acceptable	X	X	X	X	4
Largely unacceptable					0
Marginal	X			X	2
Mildly acceptable	X	X	X	X	4
Mildly acceptable	X	X	X	X	4
Moderately acceptable					0
Moderately unacceptable	X				1
Most acceptable			X	X	2
Most unacceptable				X	1
Neutral				X	1
Notably unacceptable	X	X	X	X	4
Pretty acceptable					0
Pretty unacceptable					0
Quite acceptable					0
Quite unacceptable					0
Rather acceptable					0
Rather unacceptable					0
Reasonably acceptable			X	X	2
Reasonably unacceptable					0
Slightly acceptable	X	X		X	3
Slightly unacceptable					0
Somewhat acceptable	X	X	X	X	4
Somewhat unacceptable					0
Sort of acceptable					0
Substantially unacceptable		X			1
Totally unacceptable			X		1
Unacceptable	X	X	X	X	4
Very very acceptable				X	1
Very very unacceptable					0
Wholly acceptable	X		X	X	3
Wholly unacceptable					0
Total # of sig differences per draw	14*	11*	14*	19*	

*Indicates a significant Chi-square statistic

Table 23. Significant adequacy mean differences generated by working age males and college males across several sample draws

Descriptors	Draw 1	Draw 2	Draw 3	Draw 4	Total # of sig draws
Absolutely adequate	X	X	X	X	4
Absolutely inadequate					0
Barely adequate	X	X	X	X	4
Barely inadequate					0
Borderline					0
Completely adequate		X	X	X	3
Completely inadequate					0
Considerably adequate					0
Considerably inadequate					0
Decidedly adequate	X				1
Decidedly inadequate	X	X	X	X	4
Entirely adequate	X	X	X	X	4
Entirely inadequate					0
Exceptionally adequate				X	1
Exceptionally inadequate					0
Exceptionally inadequate					0
Extremely adequate	X	X	X	X	4
Extremely inadequate					0
Fairly inadequate					0
Fully adequate	X	X	X	X	4
Fully inadequate					0
Highly adequate	X	X	X	X	4
Highly inadequate					0
Largely adequate	X	X	X	X	4
Mildly adequate					0
Mildly inadequate				X	1
Moderately inadequate					0
Most adequate					0
Most inadequate			X		1
Neutral					0
Perfectly adequate	X	X	X	X	4
Pretty adequate			X		1
Pretty inadequate					0
Quite adequate					0
Rather adequate	X	X	X	X	4
Rather inadequate					0
Reasonably adequate					0
Slightly adequate		X	X	X	3
Slightly inadequate					0
Somewhat adequate		X			1
Somewhat inadequate				X	1
Substantially adequate			X	X	2
Totally adequate		X	X		2
Totally inadequate					0
Very adequate	X		X	X	3
Very inadequate					0
Very very adequate	X	X	X	X	4
Very very inadequate			X	X	2
Wholly adequate		X		X	2
Wholly inadequate		X			1
Total # of sig differences per draw	13*	17*	19*	20*	

*Indicates a significant Chi-square statistic

Table 24. Significant goodness mean differences generated by working age males and college males across several sample draws

Descriptors	Draw 1	Draw 2	Draw 3	Draw 4	Total # of sig draws
Absolutely alike	X	X	X	X	4
Absolutely best	X				1
Absolutely better					0
Absolutely worse					0
Absolutely worst			X		1
Alike	X	X	X	X	4
Barely better	X	X	X	X	4
Barely worse					0
Best	X	X	X	X	4
Best of all	X	X	X	X	4
Borderline					0
Considerably worse					0
Conspicuously better					0
Conspicuously worse	X	X	X	X	4
Decidedly best	X	X	X	X	4
Decidedly better	X	X	X	X	4
Decidedly worse					0
Decidedly worst	X	X	X	X	4
Extremely better					0
Largely worse		X	X	X	3
Marginal					0
Moderately better					0
Moderately worse					0
Much worse					0
Neutral					0
Notably worse	X	X	X	X	4
Noticeably worse					0
Rather better			X	X	2
Slightly better	X	X		X	3
Slightly worse					0
Somewhat better					0
Somewhat worse					0
Substantially better					0
Substantially worse					0
The same					0
Truly best	X	X	X	X	4
Undoubtedly best					0
Undoubtedly worst	X	X	X		3
Very much worse				X	1
Worse					0
Worst of all	X	X	X	X	4
Total # of sig differences per draw	15*	15*	16*	16*	

*Indicates a significant Chi-square statistic

When a group comparison revealed a significant number of mean differences across all three lists, two separate analyses were conducted. The first binomial analysis determined if either group generated more extreme (larger absolute values) ratings. The second binomial analysis determined if either working age males or college males generated more positive ratings. Among the responses attaining significant t_{PROB} values, college males provided a greater number of more extreme responses than working age males for 8 of the acceptability responses and 11 of the adequacy responses. Working age males provided more extreme values on 10 of the relative goodness response alternatives than the college males. Binomial tests were performed to determine if the directional differences were attributable to factors other than chance. The distributions of greater significant mean values and associated binomial probabilities are summarized in Table 25.

Table 25. Distributions of extreme significant mean values and associated binomial probabilities for working age males and college males

	Extreme Significant Means		p
	Working age males	College males	
Acceptability	6	8	.791
Adequacy	2	11	.022
Goodness	10	4	.118

As shown in Table 25, two-tailed probabilities for adequacy responses show a significant difference, but no significant differences exist for the acceptability and relative goodness responses. These results do not show a consistent trend for either working age males or college males to assign more extreme values.

Binomial tests were also performed to determine any differences in the directionality of the mean ratings generated by college males or working age males. For

the responses with significant t_{PROB} values, college males provided more positive ratings than working age males on the acceptability, adequacy, and relative goodness lists. The associated binomial probabilities were significant for the acceptability and adequacy lists. The distributions of more positive significant mean values and associated binomial probabilities are summarized in Table 26.

Table 26. Distributions of higher significant mean values and associated binomial probabilities for working age males and college males

	Larger Significant Means		p
	Working age males	College males	
Acceptability	0	14	.000
Adequacy	1	12	.004
Goodness	6	9	.607

Variability differences. To determine if variability differences existed for ratings provided by working age males and college males, the F_{MAX} values from the previous section were evaluated. The evaluation revealed 16 significant F_{MAX} values for the acceptability list, 16 significant values for the adequacy list, and 12 significant values for the relative goodness list ($F_{\text{CRIT}}(2,53) = 2.07, p=.05$), see Appendix P.

A Chi-square analysis was performed (Table 27) to determine if the number of significant F_{MAX} values was above chance. The analysis revealed a significant number of differences in the variability of responses provided by working age males and college males on all three lists of response alternatives.

Table 27. Distribution of significant F_{MAX} values and associated Chi-square probabilities for working age males and college males*

	Acceptability	Adequacy	Goodness
Working age males and college males	16/50 (.001)	16/50 (.001)	12/41 (.004)

*Probabilities from Chi square calculations in parentheses

Descriptor order. To determine if the order of the means generated by the working age males and college males were consistent, the mean values were plotted and correlations calculated. The order of mean values generated by working age males and college males for response alternatives of acceptability, adequacy, and relative goodness were very similar as indicated by the high correlations between the means, which were 0.996, 0.997, and 0.991, respectively. See Appendix Q for the bivariate plots and correlations.

Comparison of Ratings by Working Age Females and College Females

Mean rating differences. Calculation of the t -values revealed significant differences between 28% of the working age females and college females responses (13 out of 50 response alternatives) on the acceptability list, 34% of the responses (17 out of the 50 response alternatives) on the adequacy list, and 32% of the responses (13 out of 41 response alternatives) on the goodness list. Table 28 shows the results of the t tests for working age females and college females on the acceptability list. The results are sorted in descending order based upon working age females. The results of t tests for working age females and college females on the adequacy and goodness lists can be found in Appendix R.

Table 28. Comparison of the acceptability response alternative values for working age females and college females

Descriptors	WA Females			College Females			Diff*	t	t _{PROB}	Sig
	Mean	SD	N	Mean	SD	N				
Extremely acceptable	4.48	1.28	54	4.59	0.63	54	0.11	0.57	0.573	
Very very acceptable	4.41	0.74	54	4.46	0.66	54	0.05	0.37	0.712	
Completely acceptable	4.33	1.50	54	4.57	0.72	54	0.24	1.06	0.293	
Fully acceptable	4.11	0.96	54	4.48	0.75	54	0.37	2.23	0.028	X
Wholly acceptable	4.06	1.47	54	4.09	1.09	54	0.03	0.12	0.904	
Highly acceptable	4.04	1.29	54	4.34	0.52	53	0.30	1.58	0.118	
Most acceptable	3.72	1.47	54	4.30	0.72	54	0.58	2.60	0.011	X
Quite acceptable	3.19	1.12	54	3.22	0.84	54	0.03	0.16	0.875	
Largely acceptable	2.87	1.94	54	3.75	0.70	53	0.88	3.13	0.003	X
Pretty acceptable	2.52	0.69	54	2.35	0.76	54	0.17	1.22	0.226	
Moderately acceptable	2.43	0.60	54	2.57	0.57	54	0.14	1.24	0.217	
Rather acceptable	2.37	0.90	54	2.02	0.82	53	0.35	2.10	0.038	X
Acceptable	2.33	1.21	54	2.09	1.43	54	0.24	0.94	0.349	
Reasonably acceptable	2.24	1.11	54	2.46	0.77	54	0.22	1.20	0.234	
Fairly acceptable	1.91	0.98	54	2.13	0.70	54	0.22	1.34	0.182	
Mildly acceptable	1.41	0.69	54	1.74	0.73	54	0.33	2.41	0.017	X
Somewhat acceptable	1.35	1.05	54	1.67	0.67	54	0.32	1.89	0.062	
Mildly acceptable	1.35	0.59	54	1.74	0.73	54	0.39	3.05	0.003	X
Slightly acceptable	1.20	0.41	54	1.34	0.59	53	0.14	1.42	0.158	
Sort of acceptable	1.06	0.63	54	1.13	0.52	53	0.07	0.63	0.533	
Barely acceptable	0.89	0.84	54	0.09	1.55	54	0.80	3.33	0.001	X
Neutral	0.00	0.00	54	-0.02	0.14	54	0.02	1.05	0.296	
Borderline	-0.07	0.38	54	-0.04	0.27	54	0.03	0.55	0.586	
Marginal	-0.17	0.64	54	0.00	0.27	54	0.17	1.80	0.076	
Barely unacceptable	-1.06	0.68	54	-1.23	0.67	53	0.17	1.30	0.196	
Slightly unacceptable	-1.20	0.63	54	-1.24	0.67	54	0.04	0.32	0.750	
Somewhat unacceptable	-1.80	0.74	54	-2.13	0.76	53	0.33	2.28	0.025	X
Moderately unacceptable	-2.35	1.07	54	-2.24	0.75	54	0.11	0.62	0.538	
Fairly unacceptable	-2.39	0.86	54	-1.96	0.85	54	0.43	2.61	0.010	X
Rather unacceptable	-2.54	1.00	54	-2.20	1.14	54	0.34	1.65	0.102	
Reasonably unacceptable	-2.59	0.81	54	-2.43	0.81	54	0.16	1.03	0.307	
Pretty unacceptable	-2.83	0.72	54	-2.65	0.89	54	0.18	1.16	0.251	
Unacceptable	-3.17	1.37	54	-2.38	1.43	53	0.79	2.92	0.004	X
Notably unacceptable	-3.19	0.87	54	-2.89	0.97	53	0.30	1.68	0.095	
Quite unacceptable	-3.50	1.08	54	-3.43	0.94	54	0.07	0.36	0.720	
Decidedly unacceptable	-3.52	1.27	54	-3.19	1.15	54	0.33	1.42	0.160	
Considerably unacceptable	-3.56	1.25	54	-3.57	0.86	54	0.01	0.05	0.961	
Largely unacceptable	-3.89	0.63	54	-3.81	0.70	54	0.08	0.62	0.534	
Substantially unacceptable	-3.93	0.77	54	-3.28	0.98	54	0.65	3.83	0.000	X
Most unacceptable	-4.33	0.82	54	-4.35	0.78	54	0.02	0.13	0.897	
Highly unacceptable	-4.43	1.27	54	-4.33	0.58	54	0.10	0.53	0.600	
Highly unacceptable	-4.52	0.54	54	-4.43	0.64	53	0.09	0.79	0.433	
Very very unacceptable	-4.61	0.56	54	-4.61	0.53	54	0.00	0.00	1.000	
Wholly unacceptable	-4.63	1.32	54	-4.41	0.77	54	0.22	1.06	0.293	
Exceptionally unacceptable	-4.78	0.50	54	-4.65	0.59	54	0.13	1.24	0.219	
Extremely unacceptable	-4.87	0.34	54	-4.76	0.43	54	0.11	1.47	0.143	
Totally unacceptable	-4.96	0.19	54	-4.83	0.54	54	0.13	1.67	0.100	
Completely unacceptable	-4.98	0.14	54	-4.70	0.63	54	0.28	3.19	0.002	X
Absolutely unacceptable	-5.00	0.00	54	-4.81	0.59	54	0.19	2.37	0.020	X
Entirely unacceptable	-5.00	0.00	54	-4.94	0.30	54	0.06	1.47	0.145	

*Absolute value of the difference. X: significant <.05

After the *t*-tests revealed significant differences in response alternatives generated by working age females and college females, the next step was to determine if the number of significant differences in mean values was beyond chance level. A Chi-square analysis was performed and the probabilities were calculated based on the number of significant t_{PROB} values. The significant t_{PROB} values and Chi-square probabilities for working age females and college females are summarized in Table 29.

Table 29. Summary of significant t_{PROB} values and Chi-square probabilities for working age females and college females*

	Acceptability	Adequacy	Goodness
Working age females and college females	13/50 (.004)	17/50 (.001)	13/41 (.002)

* Probabilities from Chi square calculations in parentheses

As shown in Table 29, the Chi-square probabilities reveal the significant differences between ratings generated by working age females and college females. The number of differences in ratings of acceptability, adequacy, and relative goodness response alternatives cannot be attributed simply to chance.

To ensure the significant differences in mean ratings generated by working age females and college females was not due to sampling error, several samples of 54 working age female response sets were randomly selected from the total 69 valid working age female responses. As described in the section entitled Working Age Female Participants, the first draw was a random selection of 54 response sets. The second draw included the 15 working age female response sets not included in the first draw and a random selection from the other 54 response sets. The third and fourth drawing was a

random selection from the total 69 valid response sets. This draw procedure ensured that every valid working age female response set was used at least once in the analysis.

As shown in Table 30 the number of significant differences in mean ratings for acceptability generated by working age females and college females remains at a significant level across the four different draws. The number of significant mean differences ranged from 12 to 17. The distribution of differences reveals consistency between the different sample draws with 13 of the acceptability response alternatives receiving a significant number of different mean ratings on at least three of the four sample draws. Table 31 and Table 32 illustrate similar patterns with the number of significant differences ranging from 10 to 17 for the multiple draws of adequacy and relative goodness. While this technique was used to ensure the differences were not due to sampling error, the subsequent analyses were based on the first draw.

Table 30. Significant acceptability mean differences generated by working age females and college females across several sample draws

Descriptors	Draw 1	Draw 2	Draw 3	Draw 4	Total # of sig draws
Absolutely unacceptable	X		X	X	3
Acceptable		X	X		2
Barely acceptable	X		X	X	3
Barely unacceptable			X		1
Borderline					0
Completely acceptable					0
Completely unacceptable	X	X	X		3
Considerably unacceptable					0
Decidedly unacceptable		X	X		2
Entirely unacceptable					0
Exceptionally unacceptable					0
Extremely acceptable					0
Extremely unacceptable			X		1
Fairly acceptable					0
Fairly unacceptable	X	X	X	X	4
Fully acceptable	X		X	X	3
Highly acceptable					0
Highly unacceptable					0
Highly unacceptable					0
Largely acceptable	X	X	X	X	4
Largely unacceptable					0
Marginal					0
Mildly acceptable	X	X		X	3
Mildly acceptable	X	X	X	X	4
Moderately acceptable					0
Moderately unacceptable					0
Most acceptable	X		X	X	3
Most unacceptable					0
Neutral					0
Notably unacceptable		X	X		2
Pretty acceptable					0
Pretty unacceptable					0
Quite acceptable					0
Quite unacceptable					0
Rather acceptable	X	X	X	X	4
Rather unacceptable					0
Reasonably acceptable					0
Reasonably unacceptable					0
Slightly acceptable					0
Slightly unacceptable					0
Somewhat acceptable					0
Somewhat unacceptable	X	X	X	X	4
Sort of acceptable					0
Substantially unacceptable	X	X	X	X	4
Totally unacceptable					0
Unacceptable	X	X	X	X	4
Very very acceptable					0
Very very unacceptable					0
Wholly acceptable					0
Wholly unacceptable		X			1
Total # of sig differences per draw	13*	13*	17*	12*	

*Indicates a significant Chi-square statistic

Table 31. Significant adequacy mean differences generated by working age females and college females across several sample draws

Descriptors	Draw 1	Draw 2	Draw 3	Draw 4	Total # of sig draws
Absolutely adequate			X		1
Absolutely inadequate					0
Barely adequate	X	X	X	X	4
Barely inadequate					0
Borderline					0
Completely adequate	X	X	X	X	4
Completely inadequate					0
Considerably adequate					0
Considerably inadequate					0
Decidedly adequate	X	X	X	X	4
Decidedly inadequate		X	X		2
Entirely adequate	X	X	X	X	4
Entirely inadequate					0
Exceptionally adequate					0
Exceptionally inadequate	X	X	X	X	4
Exceptionally inadequate	X	X	X	X	4
Extremely adequate	X	X		X	3
Extremely inadequate					0
Fairly inadequate	X	X	X	X	4
Fully adequate	X	X		X	3
Fully inadequate					0
Highly adequate	X	X	X	X	4
Highly inadequate					0
Largely adequate	X	X	X	X	4
Mildly adequate	X			X	2
Mildly inadequate					0
Moderately inadequate	X	X		X	3
Most adequate			X		1
Most inadequate					0
Neutral					0
Perfectly adequate					0
Pretty adequate					0
Pretty inadequate					0
Quite adequate					0
Rather adequate	X	X	X	X	4
Rather inadequate					0
Reasonably adequate					0
Slightly adequate					0
Slightly inadequate					0
Somewhat adequate					0
Somewhat inadequate	X	X		X	3
Substantially adequate					0
Totally adequate	X	X	X	X	4
Totally inadequate					0
Very adequate					0
Very inadequate					0
Very very adequate	X		X	X	3
Very very inadequate					0
Wholly adequate			X		1
Wholly inadequate					0
Total # of sig differences per draw	17*	16*	16*	17*	

*Indicates a significant Chi-square statistic

Table 32. Significant goodness mean differences generated by working age females and college females across several sample draws

Descriptors	Draw 1	Draw 2	Draw 3	Draw 4	Total # of sig draws
Absolutely alike					0
Absolutely best					0
Absolutely better					0
Absolutely worse					0
Absolutely worst					0
Alike	X		X	X	3
Barely better	X	X		X	3
Barely worse					0
Best		X	X		2
Best of all					0
Borderline					0
Considerably worse					0
Conspicuously better					0
Conspicuously worse					0
Decidedly best	X	X	X	X	4
Decidedly better	X	X	X	X	4
Decidedly worse	X	X	X	X	4
Decidedly worst					0
Extremely better	X			X	2
Largely worse					0
Marginal	X			X	2
Moderately better	X	X	X	X	4
Moderately worse					0
Much worse					0
Neutral					0
Notably worse					0
Noticeably worse					0
Rather better	X	X	X	X	4
Slightly better					0
Slightly worse					0
Somewhat better					0
Somewhat worse					0
Substantially better	X	X	X	X	4
Substantially worse	X	X	X	X	4
The same					0
Truly best	X	X	X	X	4
Undoubtedly best					0
Undoubtedly worst					0
Very much worse					0
Worse					0
Worst of all	X			X	2
Total # of sig differences per draw	13*	10*	10*	13*	

*Indicates a significant Chi-square statistic

Among the responses attaining significant t_{PROB} values, working age females provided a greater number of more extreme responses (larger absolute values) than college females for 7 of the acceptability responses and 9 of the relative goodness responses. College females provided more extreme values on 12 of the adequacy response alternatives than working age females. Binomial tests were performed to determine if the directional differences were attributable to factors other than chance. The distributions of extreme significant mean values and associated binomial probabilities are summarized in Table 33

Table 33. Distributions of extreme significant mean values and associated binomial probabilities for working age females and college females

	Extreme Significant Means		p
	Working age females	College females	
Acceptability	7	6	1.000
Adequacy	5	12	.143
Goodness	9	6	.607

As shown in Table 33, two-tailed probabilities for acceptability, adequacy, and relative goodness responses show no significant differences. These results do not show a consistent trend for neither working age females nor college females to assign more extreme values.

Binomial tests were also performed to determine any differences in the directionality of the mean ratings generated by college females or working age females. For the responses with significant t_{PROB} values, college females provided more positive ratings than working age males on the acceptability, adequacy, and relative goodness lists. The associated binomial probabilities were significant for the acceptability list, and marginally significant for the adequacy list. The distributions of more positive

significant mean values and associated binomial probabilities are summarized in Table 34.

Table 34. Distributions of higher significant mean values and associated binomial probabilities for working age females and college females

	Higher Significant Means		p
	Working age females	College females	
Acceptability	3	10	.092
Adequacy	2	15	.002
Goodness	7	8	1.000

Variability differences. To determine if variability differences existed for ratings provided by working age females and college females, the F_{MAX} values from the previous section were evaluated. The evaluation revealed 15 significant F_{MAX} values for the acceptability list, 22 significant values for the adequacy list, and 4 significant values for the relative goodness list ($F_{CRIT}(2,53) = 2.07, p=.05$), see Appendix S.

A Chi-square analysis was performed (Table 35) to determine if the number of significant F_{MAX} values was above chance. The analysis revealed a significant number of differences in the variability of responses provided by working age females and college females on the relative goodness list, but not a significant amount of differences in variability for the acceptability and adequacy lists.

Table 35. Distribution of significant F_{MAX} values and associated Chi-square probabilities for working age females and college females*

	Acceptability	Adequacy	Goodness
Working age females and college females	15/50 (.001)	22/50 (.001)	4/41 (.410)

*Probabilities from Chi square calculations in parentheses

Descriptor order. The order of mean values generated by working age females and college females for response alternatives of acceptability, adequacy, and relative goodness were very similar as indicated by the high correlations between the means, which were 0.996, 0.998, and 0.997, respectively. See Appendix T for the bivariate plots and correlations.

Comparison of Ratings by Working Age Personnel and College Students

Mean rating differences. Calculation of the t -values revealed significant differences between 44% of the working age personnel and college students responses (22 out of 50 response alternatives) on the acceptability list, 38% of the responses (19 out of the 50 response alternatives) on the adequacy list, and 32% of the responses (13 out of 41 response alternatives) on the goodness list. Table 36 shows the results of the t tests for working age personnel and college students on the acceptability list. The response alternatives are sorted in descending order based upon working age personnel. The results of t tests for working age personnel and college students on the adequacy and goodness lists can be found in Appendix U.

After the t -tests revealed significant differences in response alternatives generated by working age personnel and college students, the next step was to determine if the number of significant differences in mean values was beyond chance. A Chi-square analysis was performed and the probabilities were calculated based on the number of significant t_{PROB} values.

Table 36. Comparison of the acceptability response alternative values for working age personnel and college students

Descriptors	WA Personnel			College Students			Diff*	t	t _{PROB}	Sig
	Mean	SD	N	Mean	SD	N				
Completely acceptable	4.44	1.18	107	4.58	0.73	108	0.14	1.05	0.293	
Very very acceptable	4.27	1.19	107	4.44	0.75	108	0.17	1.25	0.214	
Extremely acceptable	4.17	2.03	107	4.55	0.59	107	0.38	1.87	0.064	
Fully acceptable	4.17	0.91	107	4.49	0.73	108	0.32	2.87	0.005	X
Highly acceptable	3.93	1.22	107	4.21	0.51	107	0.28	2.23	0.027	X
Wholly acceptable	3.84	1.69	107	4.22	0.95	108	0.38	2.02	0.045	X
Most acceptable	3.64	1.46	107	4.23	0.77	108	0.59	3.68	0.000	X
Quite acceptable	3.14	1.28	107	3.17	0.89	108	0.03	0.20	0.844	
Largely acceptable	2.72	1.66	107	3.68	0.71	104	0.96	5.48	0.000	X
Acceptable	2.61	1.26	107	2.15	1.26	108	0.46	2.66	0.008	X
Pretty acceptable	2.50	0.74	107	2.42	0.74	108	0.08	0.74	0.458	
Rather acceptable	2.26	0.98	107	2.1	0.78	105	0.16	1.32	0.187	
Reasonably acceptable	2.26	0.94	107	2.45	0.74	106	0.19	1.63	0.105	
Moderately acceptable	2.22	0.86	107	2.47	0.64	108	0.25	2.38	0.018	X
Fairly acceptable	2.01	0.81	107	2.1	0.72	108	0.09	0.87	0.386	
Mildly acceptable	1.45	0.88	107	1.81	0.74	108	0.36	3.26	0.001	X
Mildly acceptable	1.41	0.64	107	1.78	0.73	103	0.37	3.89	0.000	X
Somewhat acceptable	1.40	0.70	107	1.69	0.62	108	0.29	3.20	0.002	X
Slightly acceptable	1.07	0.49	107	1.28	0.55	106	0.21	2.88	0.004	X
Sort of acceptable	0.97	0.68	107	1.09	0.58	107	0.12	1.37	0.173	
Barely acceptable	0.77	0.75	107	0.33	1.36	106	0.44	2.90	0.004	X
Neutral	-0.03	0.17	107	-0.01	0.1	108	0.02	0.97	0.335	
Marginal	-0.09	1.01	107	0.03	0.37	108	0.12	1.19	0.235	
Borderline	-0.11	0.62	107	-0.05	0.35	108	0.06	0.90	0.367	
Barely unacceptable	-1.05	0.69	107	-1.15	0.51	103	0.10	1.23	0.221	
Slightly unacceptable	-1.15	0.43	107	-1.23	0.65	108	0.08	1.07	0.285	
Somewhat unacceptable	-1.74	0.78	107	-2.04	0.74	107	0.30	2.90	0.004	X
Rather unacceptable	-2.26	0.87	107	-2.31	0.98	107	0.05	0.38	0.704	
Fairly unacceptable	-2.29	0.87	107	-2.05	0.79	108	0.24	2.12	0.035	X
Moderately unacceptable	-2.50	0.74	107	-2.21	0.7	107	0.29	2.98	0.003	X
Reasonably unacceptable	-2.50	0.85	107	-2.34	0.79	107	0.16	1.47	0.144	
Pretty unacceptable	-2.83	0.86	107	-2.7	0.84	107	0.13	1.13	0.259	
Notably unacceptable	-3.26	0.96	107	-2.89	0.95	105	0.37	2.83	0.005	X
Unacceptable	-3.30	1.33	107	-2.34	1.3	108	0.96	5.34	0.000	X
Quite unacceptable	-3.41	1.27	107	-3.32	0.85	106	0.09	0.62	0.539	
Considerably unacceptable	-3.57	1.06	107	-3.3	0.93	107	0.27	1.98	0.049	X
Largely unacceptable	-3.58	0.66	107	-3.71	0.66	108	0.13	1.45	0.148	
Substantially unacceptable	-3.69	0.77	107	-3.27	0.96	108	0.42	3.55	0.000	X
Decidedly unacceptable	-3.82	0.96	107	-3.07	1.15	107	0.75	5.20	0.000	X
Most unacceptable	-4.14	0.91	107	-4.38	0.76	107	0.24	2.10	0.037	X
Highly unacceptable	-4.29	0.67	107	-4.24	0.58	108	0.05	0.58	0.562	
Highly unacceptable	-4.31	0.61	107	-4.3	0.59	107	0.01	0.10	0.918	
Very very unacceptable	-4.59	0.60	107	-4.64	0.54	108	0.05	0.66	0.510	
Exceptionally unacceptable	-4.64	0.60	107	-4.62	0.58	107	0.02	0.19	0.848	
Wholly unacceptable	-4.66	0.63	107	-4.43	0.79	108	0.23	2.40	0.017	X
Completely unacceptable	-4.81	0.48	107	-4.72	0.56	108	0.09	1.31	0.192	
Extremely unacceptable	-4.82	0.41	107	-4.75	0.5	108	0.07	1.16	0.246	
Entirely unacceptable	-4.86	0.44	107	-4.88	0.43	108	0.02	0.34	0.735	
Totally unacceptable	-4.87	0.39	107	-4.8	0.48	107	0.07	1.16	0.249	
Absolutely unacceptable	-4.93	0.25	107	-4.87	0.46	108	0.06	1.28	0.202	

*Absolute value of the difference. X: significant <0.05

The significant t_{PROB} values and Chi-square probabilities for working age personnel and college students are summarized in Table 37.

Table 37. Summary of significant t_{PROB} values and Chi-square probabilities for working age personnel and college students*

	Acceptability	Adequacy	Goodness
Working age personnel and college students	22/50 (.000)	19/50 (.000)	13/41 (.002)

* Probabilities from Chi square calculations in parentheses

As shown in Table 37, the Chi-square probabilities reveal the significant differences between ratings generated by working age personnel and college students. The number of differences in ratings of acceptability, adequacy, and relative goodness response alternatives cannot be attributed simply to chance.

Among the responses attaining significant t_{PROB} values, college students provided more extreme responses (larger absolute values) than working age personnel for 12 of the acceptability responses and 17 of the adequacy responses. Working age personnel provided more extreme values on 8 of the relative goodness response alternatives than college students. Binomial tests were performed to determine if the directional differences were attributable to factors other than chance. The distributions of extreme significant mean values and associated binomial probabilities are summarized in Table 38.

Table 38. Distributions of extreme significant mean values and associated binomial probabilities for working age personnel and college students

	Extreme Significant Means		
	Working age personnel	College students	p
Acceptability	10	12	.832
Adequacy	2	17	.001
Goodness	8	5	.581

As shown in Table 38, while two-tailed probabilities for acceptability and relative goodness responses show no significant differences, the number of adequacy extreme ratings generated by college students was significant. Although there are a large number of extreme ratings generated by college students for the adequacy list, the other differences do not show a consistent trend.

Binomial tests were also performed to determine any differences in the directionality of the mean ratings generated by college students or working age personnel. For the responses with significant t_{PROB} values, college students provided more positive ratings than working age personnel on the acceptability, adequacy, and relative goodness lists. The associated binomial probabilities were significant for the acceptability and adequacy lists. The distributions of more positive significant mean values and associated binomial probabilities are summarized in Table 39.

Table 39. Distributions of higher significant mean values and associated binomial probabilities for working age personnel and college students

	Higher Significant Means		
	Working age personnel	College students	p
Acceptability	4	18	.004
Adequacy	2	17	.001
Goodness	6	7	1.000

Variability differences. To determine if variability differences existed for ratings provided by working age personnel and college students, the F_{MAX} values from the previous section were evaluated. The evaluation revealed 14 significant F_{MAX} values for the acceptability list, 18 significant values for the adequacy list, and 9 significant values for the relative goodness list ($F_{CRIT}(2,53) = 2.07, p=.05$), see Appendix V.

A Chi-square analysis was performed (Table 40) to determine if the number of significant F_{MAX} values was above chance. The analysis revealed a significant number of differences in the variability of responses provided by working age personnel and college students on the acceptability, adequacy, and relative goodness list.

Table 40. Distribution of significant F_{MAX} values and associated Chi-square probabilities for working age personnel and college students*

	Acceptability	Adequacy	Goodness
Working age personnel and college students	14/50 (.002)	18/50 (.000)	9/41 (.025)

*Probabilities from Chi square calculations in parentheses

Descriptor order. The order of mean values generated by working age personnel and college students for response alternatives of acceptability, adequacy, and relative goodness were very similar as indicated by the high correlations between the means, which were 0.996, 0.997, and 0.997, respectively. See Appendix W for the bivariate plots and correlations.

Comparison of Ratings by Working Age Males and Working Age Females

Mean rating differences. Calculation of the t -values revealed significant differences between 16% of the working age males and working age females responses (8 out of 50 response alternatives) on the acceptability list, 16% of the responses (8 out of the 50 response alternatives) on the adequacy list, and 12% of the responses (5 out of 41 response alternatives) on the goodness list. Table 41 shows the results of the t tests for working age males and working age females on the acceptability list. The results are sorted in descending order based upon working age males. The results of the t tests for working age males and working age females on the adequacy and relative goodness lists can be found in Appendix X.

After the t -tests revealed significant differences in response alternatives generated by working age males and working age females, the next step was to determine if the number of significant differences in mean values was beyond chance. A Chi-square analysis was performed and the probabilities calculated based on the number of significant t_{PROB} values.

Table 41. Comparison of the acceptability response alternative values for working age males and working age females

Descriptors	WA Males			WA Females			Diff*	t	t _{PROB}	Sig
	Mean	SD	N	Mean	SD	N				
Completely acceptable	4.26	1.48	54	4.33	1.50	54	0.07	-0.26	0.797	
Fully acceptable	4.15	0.90	54	4.11	0.96	54	0.04	0.21	0.837	
Very very acceptable	4.06	1.45	54	4.41	0.74	54	0.35	-1.59	0.115	
Wholly acceptable	4.00	0.99	54	4.06	1.47	54	0.06	-0.23	0.819	
Highly acceptable	3.85	1.14	54	4.04	1.29	54	0.19	-0.79	0.431	
Most acceptable	3.76	1.34	54	3.72	1.47	54	0.04	0.14	0.892	
Extremely acceptable	3.61	2.73	54	4.48	1.28	54	0.87	-2.12	0.037	X
Quite acceptable	2.87	1.29	54	3.19	1.12	54	0.31	-1.36	0.178	
Acceptable	2.63	1.25	54	2.33	1.21	54	0.30	1.25	0.214	
Largely acceptable	2.46	1.90	54	2.87	1.94	54	0.41	-1.10	0.273	
Pretty acceptable	2.39	0.66	54	2.52	0.69	54	0.13	-1.00	0.321	
Reasonably acceptable	2.24	0.73	54	2.24	1.11	54	0.00	0.00	1.000	
Rather acceptable	2.22	1.19	54	2.37	0.90	54	0.15	-0.73	0.467	
Moderately acceptable	2.04	1.16	54	2.43	0.60	54	0.39	-2.18	0.032	X
Fairly acceptable	1.94	0.68	54	1.91	0.98	54	0.04	0.23	0.820	
Mildly acceptable	1.46	0.61	54	1.41	0.69	54	0.06	-0.57	0.573	
Somewhat acceptable	1.33	0.73	54	1.35	1.05	54	0.02	-0.11	0.915	
Mildly acceptable	1.31	0.99	54	1.35	0.59	54	0.04	0.97	0.335	
Sort of acceptable	1.09	0.59	54	1.06	0.63	54	0.04	0.32	0.753	
Slightly acceptable	1.02	0.57	54	1.20	0.41	54	0.19	-1.95	0.053	
Barely acceptable	0.80	0.59	54	0.89	0.84	54	0.09	-0.66	0.510	
Neutral	-0.04	0.19	54	0.00	0.00	54	0.04	-1.43	0.156	
Borderline	-0.13	0.70	54	-0.07	0.38	54	0.06	-0.51	0.611	
Marginal	-0.31	0.97	54	-0.17	0.64	54	0.15	-0.94	0.350	
Barely unacceptable	-0.98	0.49	54	-1.06	0.68	54	0.07	0.64	0.521	
Slightly unacceptable	-1.19	0.39	54	-1.20	0.63	54	0.02	0.18	0.854	
Somewhat unacceptable	-1.69	0.91	54	-1.80	0.74	54	0.11	0.70	0.486	
Fairly unacceptable	-2.22	0.66	54	-2.39	0.86	54	0.17	1.13	0.261	
Rather unacceptable	-2.39	0.86	54	-2.54	1.00	54	0.15	0.83	0.411	
Moderately unacceptable	-2.44	0.69	54	-2.35	1.07	54	0.09	-0.54	0.594	
Reasonably unacceptable	-2.48	0.93	54	-2.59	0.81	54	0.11	0.66	0.509	
Pretty unacceptable	-2.78	1.11	54	-2.83	0.72	54	0.06	0.31	0.758	
Notably unacceptable	-3.24	0.93	54	-3.19	0.87	54	0.06	-0.32	0.749	
Quite unacceptable	-3.30	1.09	54	-3.50	1.08	54	0.20	0.98	0.331	
Unacceptable	-3.43	1.13	54	-3.17	1.37	54	0.26	-1.07	0.285	
Substantially unacceptable	-3.57	0.72	54	-3.93	0.77	54	0.35	2.45	0.016	X
Largely unacceptable	-3.57	0.63	54	-3.89	0.63	54	0.31	2.58	0.011	X
Considerably unacceptable	-3.59	0.77	54	-3.56	1.25	54	0.04	-0.19	0.853	
Decidedly unacceptable	-3.70	1.37	54	-3.52	1.27	54	0.19	-0.73	0.468	
Highly unacceptable	-4.09	0.52	54	-4.43	1.27	54	0.33	4.16	0.000	X
Highly unacceptable	-4.17	0.54	54	-4.52	0.54	54	0.35	1.38	0.170	
Most unacceptable	-4.24	0.82	54	-4.33	0.82	54	0.09	0.58	0.560	
Wholly unacceptable	-4.43	1.44	54	-4.63	1.32	54	0.20	0.77	0.445	
Very very unacceptable	-4.48	0.57	54	-4.61	0.56	54	0.13	1.18	0.239	
Exceptionally unacceptable	-4.59	0.60	54	-4.78	0.50	54	0.19	1.74	0.085	
Completely unacceptable	-4.72	0.60	54	-4.98	0.14	54	0.26	3.12	0.003	X
Extremely unacceptable	-4.74	0.48	54	-4.87	0.34	54	0.13	1.61	0.110	
Totally unacceptable	-4.91	0.35	54	-4.96	0.19	54	0.06	1.02	0.310	
Absolutely unacceptable	-4.91	0.29	54	-5.00	0.00	54	0.09	2.33	0.022	X
Entirely unacceptable	-4.91	0.29	54	-5.00	0.00	54	0.09	2.33	0.022	X

*Absolute value of the difference. X: significant <0.05

The significant t_{PROB} values and Chi-square probabilities for working age males and working age females are summarized in Table 42.

Table 42. Summary of significant t_{PROB} values and Chi-square probabilities for working age males and working age females*

	Acceptability	Adequacy	Goodness
Working age males and working age females	8/50 (.073)	8/50 (.073)	5/41 (.245)

* Probabilities from Chi square calculations in parentheses

As shown in Table 42, the Chi-square probabilities did not reveal any significant differences between ratings generated by working age males and working age females. Therefore, the differences in ratings of acceptability, adequacy, and relative goodness response alternatives cannot be attributed to factors beyond chance.

Variability differences. To determine if variability differences existed for ratings provided by working age males and working age females, the F_{MAX} values from the previous section were evaluated. The evaluation revealed 16 significant F_{MAX} values for the acceptability list, 19 significant values for the adequacy list, and 8 significant values for the relative goodness list ($F_{\text{CRIT}}(2,53) = 2.07, p=.05$), see Appendix Y.

A Chi-square analysis was performed (Table 43) to determine if the number of significant F_{MAX} values was above chance. The analysis revealed a significant number of differences in the variability of responses provided by working age males and working age females on the acceptability, adequacy, and relative goodness lists.

Table 43. Distribution of significant F_{MAX} values and associated Chi-square probabilities for working age males and working age females*

	Acceptability	Adequacy	Goodness
Working age males and working age females	16/50 (.001)	19/50 (.001)	8/41 (.045)

*Probabilities from Chi square calculations in parentheses

Descriptor order. The order of mean values generated by working age males and working age females for response alternatives of acceptability, adequacy, and relative goodness were very similar as indicated by the high correlations between the means, which were 0.998, 0.999, and 0.998, respectively. See Appendix Z for the bivariate plots and correlations.

Comparison of Ratings by Working Age Technical Staff and Managers

As described in the beginning of the Results section, after all incomplete and invalid data were removed, 206 participants' data sets remained. For each working age sub-group comparison, (job level, age, and education level) data were randomly selected from the pool of 206 complete and valid responses to produce an equal number of participant responses in each group. By using the same number of response sets, comparisons within sub groups will be more resistant to problems encountered with unequal sample sizes. After the elimination procedures, 59 manager responses sets remained. To maintain a balanced sample, 59 response sets were randomly selected from the 113 valid response sets generated by the technical staff.

Mean rating differences. Calculation of the t -values revealed significant differences between 4% of the working age technical staff and working age managers (2

out of 50 response alternatives) on the acceptability list, 6% of the responses (3 out of the 50 response alternatives) on the adequacy list, and 5% of the responses (2 out of 41 response alternatives) on the goodness list. Table 44 shows the results of the t tests for working age technical staff and managers on the acceptability list. The results are sorted in descending order based upon working age technical staff. The results of the t tests for working age technical staff and managers on the adequacy and relative goodness lists can be found in Appendix AA.

After the t -tests revealed significant differences in response alternatives generated by working age technical staff and managers, the next step was to determine if the number of significant differences in mean values was beyond chance level. A Chi-square analysis was performed and the probabilities calculated based on the number of significant t_{PROB} values.

Table 44. Comparison of the acceptability response alternative values for technical staff and managers

Descriptors	Technical Staff			Managers			Diff*	t	t _{PROB}	Sig
	Mean	SD	N	Mean	SD	N				
Completely acceptable	4.41	0.77	59	4.34	1.48	59	0.07	0.32	0.748	
Very very acceptable	4.36	0.71	59	4.24	0.75	59	0.12	0.89	0.374	
Fully acceptable	4.10	0.92	59	4.15	0.93	59	0.05	0.29	0.770	
Wholly acceptable	4.03	1.05	59	3.86	1.83	59	0.17	0.62	0.538	
Highly acceptable	4.00	0.62	59	3.98	0.51	59	0.02	0.19	0.849	
Extremely acceptable	3.90	2.43	59	4.12	1.80	59	0.22	0.56	0.577	
Most acceptable	3.85	1.39	59	3.98	0.84	59	0.14	0.61	0.540	
Quite acceptable	3.22	0.74	59	2.95	1.25	59	0.27	1.43	0.157	
Largely acceptable	2.92	1.00	59	2.10	2.36	59	0.81	2.46	0.016	X
Acceptable	2.71	1.16	59	2.97	1.17	59	0.25	1.21	0.228	
Pretty acceptable	2.47	0.77	59	2.37	0.67	59	0.10	0.75	0.453	
Moderately acceptable	2.36	0.71	59	2.02	0.90	59	0.34	2.28	0.025	X
Reasonably acceptable	2.29	1.19	59	2.20	0.85	59	0.08	0.47	0.637	
Rather acceptable	2.22	1.04	59	2.08	0.93	59	0.14	0.77	0.442	
Fairly acceptable	1.95	1.02	59	2.00	0.77	59	0.05	0.30	0.764	
Mildly acceptable	1.42	0.56	59	1.24	0.60	59	0.19	1.68	0.095	
Somewhat acceptable	1.34	1.11	59	1.32	0.75	59	0.02	0.11	0.909	
Mildly acceptable	1.34	0.88	59	1.34	0.78	59	0.00	0.00	1.000	
Sort of acceptable	1.07	0.67	59	1.08	0.62	59	0.02	0.08	0.933	
Slightly acceptable	1.05	0.43	59	1.07	0.37	59	0.02	0.27	0.787	
Barely acceptable	0.64	0.94	59	0.75	0.73	59	0.10	0.71	0.479	
Neutral	-0.05	0.22	59	-0.02	0.13	59	0.03	0.90	0.369	
Borderline	-0.08	0.65	59	-0.14	0.60	59	0.05	0.52	0.603	
Marginal	-0.24	0.84	59	-0.12	1.22	59	0.12	0.62	0.535	
Barely unacceptable	-0.98	0.44	59	-1.05	0.39	59	0.07	0.91	0.362	
Slightly unacceptable	-1.14	0.35	59	-1.10	0.44	59	0.03	0.55	0.586	
Somewhat unacceptable	-1.66	0.66	59	-1.78	0.74	59	0.12	0.93	0.355	
Fairly unacceptable	-2.17	0.83	59	-2.29	0.91	59	0.12	0.75	0.456	
Rather unacceptable	-2.41	0.79	59	-2.22	0.74	59	0.19	1.35	0.180	
Moderately unacceptable	-2.47	0.94	59	-2.34	0.73	59	0.14	0.84	0.403	
Reasonably unacceptable	-2.47	0.75	59	-2.41	0.91	59	0.07	0.39	0.697	
Pretty unacceptable	-2.78	0.79	59	-2.71	1.10	59	0.07	0.40	0.692	
Unacceptable	-3.29	0.87	59	-3.64	1.09	59	0.36	1.93	0.056	
Quite unacceptable	-3.39	1.00	59	-3.56	0.82	59	0.17	1.01	0.315	
Notably unacceptable	-3.41	0.83	59	-3.37	0.87	59	0.03	0.26	0.799	
Substantially unacceptable	-3.59	0.56	59	-3.59	0.77	59	0.00	0.00	1.000	
Largely unacceptable	-3.61	0.67	59	-3.47	0.68	59	0.14	1.13	0.262	
Considerably unacceptable	-3.63	0.58	59	-3.53	0.70	59	0.10	0.84	0.400	
Decidedly unacceptable	-3.86	0.80	59	-3.98	0.71	59	0.12	0.86	0.391	
Highly unacceptable	-4.25	0.63	59	-4.00	1.23	59	0.25	1.39	0.168	
Highly unacceptable	-4.29	0.59	59	-4.24	0.68	59	0.05	0.43	0.670	
Most unacceptable	-4.29	0.79	59	-4.22	0.79	59	0.07	0.48	0.631	
Wholly unacceptable	-4.51	1.25	59	-4.61	1.25	59	0.10	0.43	0.665	
Very very unacceptable	-4.56	0.60	59	-4.46	0.65	59	0.10	0.87	0.387	
Exceptionally unacceptable	-4.75	0.48	59	-4.68	0.51	59	0.07	0.77	0.444	
Extremely unacceptable	-4.80	0.41	59	-4.73	0.49	59	0.07	0.84	0.402	
Completely unacceptable	-4.81	0.47	59	-4.80	0.52	59	0.02	0.11	0.913	
Totally unacceptable	-4.85	0.41	59	-4.95	0.22	59	0.10	1.65	0.102	
Entirely unacceptable	-4.90	0.30	59	-4.85	0.48	59	0.05	0.68	0.499	
Absolutely unacceptable	-4.95	0.22	59	-4.93	0.25	59	0.02	0.46	0.645	

*Absolute value of the difference. X: significant <0.05

The significant t_{PROB} values and Chi-square probabilities for working age technical staff and managers are summarized in Table 45.

Table 45. Summary of significant t_{PROB} values and Chi-square probabilities for working age technical staff and managers*

	Acceptability	Adequacy	Goodness
Working age technical staff and managers	2/50 (.809)	3/50 (.826)	2/41 (.980)

* Probabilities from Chi square calculations in parentheses

As shown in Table 45, the Chi-square probabilities did not reveal significant differences between ratings generated by working age technical staff and managers. The few differences in ratings of acceptability, adequacy, and relative goodness response alternatives cannot be attributed to factors beyond chance.

Variability differences. To determine if variability differences existed for ratings provided by working age technical staff and managers, the F_{MAX} values from the previous section were evaluated. The evaluation revealed 11 significant F_{MAX} values for the acceptability list, 12 significant values for the adequacy list, and 9 significant values for the relative goodness list ($F_{CRIT}(2,53) = 2.07, p=.05$), see Appendix AB.

A Chi-square analysis was performed (Table 46) to determine if the number of significant F_{MAX} values was above chance. The analysis revealed a significant number of differences in the variability of responses provided by working age technical staff and managers on the acceptability, adequacy, and relative goodness lists.

Table 46. Distribution of significant F_{MAX} values and associated Chi-square probabilities for working age technical staff and managers*

	Acceptability	Adequacy	Goodness
Working age technical staff and managers	11/50 (.012)	12/50 (.007)	9/41 (.024)

*Probabilities from Chi square calculations in parentheses

Descriptor order. The order of mean values generated by working age technical staff and managers for response alternatives of acceptability, adequacy, and relative goodness were very similar as indicated by the high correlations between the means, which were 0.998, 0.999, and 0.998, respectively. See Appendix AC for the bivariate plots and correlations.

Comparison of Ratings by Working Age Participants Segmented by Age

A similar procedure as described in the Working Age Technical Staff and Managers was used to distribute participants' results into the appropriate groups. Age groups were segmented by 10 year intervals: 23-32, 33-42, 43-52, 53-62, 63-72 (note: there were only five respondents in the 18-22 age group, therefore these datasets were not included in the age sub-group analysis.) Aside from the 63-72 age group, the smallest number of valid respondent sets was 28. Therefore, age groups that had valid data from more than 28 respondents were reduced to 28 by random selection. Note that while the 63-72 age group had only 11 valid respondents, their data were compared with the other groups. While the sample size of this group was expected to be small, due to the age distribution within the organization sampled, including them in the data set provides data on an older sample.

Mean rating differences. Data were tested for homogeneity of variance using the Levene statistic. If the ANOVA revealed a significant omnibus F , pairwise post hoc analysis were conducted to reveal any significant differences between the subgroups. If the Levene statistic revealed homogeneity of variance, indicated by a non-significant statistic, a Bonferoni correction was used to control for familywise error. If the Levene statistic revealed heterogeneity of variance, as indicated by a significant statistic, a Tamhane correction was used to control for familywise error. This procedure was also used for the following section entitled Comparison of Ratings by Working Age Participants Segmented by Education Level.

Calculation of the omnibus F revealed significant differences between 16% of the working age personnel responses segmented by age (8 out of 50 response alternatives) on the acceptability list, 10% of the responses (5 out of the 50 response alternatives) on the adequacy list, and 12% of the responses (5 out of 41 response alternatives) on the goodness list. Table 47 shows the results of the ANOVA for working age participants segmented by age on the acceptability list. The results are sorted in descending order based upon mean values generated by the 23-32 age group. The results of the ANOVA for working age participants segmented by age on the adequacy and relative goodness lists can be found in Appendix AD.

Since the ANOVAs had revealed significant differences in response alternatives generated by working participants segmented by age, the next step was to determine if the number of significant differences in mean values was beyond chance. A Chi-square analysis was performed and the probabilities calculated based on the number of significant omnibus F values.

Table 47. Comparison of the acceptability response alternative values for working age participants segmented by age 78

Descriptor	23-32		33-42		43-52		53-62		63-72		F*	F _{PROB}	Sig
	M	N	M	N	M	N	M	N	M	N			
Extremely acceptable	4.68	28	4.00	28	4.54	28	3.54	28	2.64	11	2.65	0.037	X
Completely acceptable	4.64	28	4.46	28	4.61	28	4.04	28	4.55	11	1.28	0.284	
Very very acceptable	4.61	28	4.32	28	4.32	28	4.14	28	4.36	11	1.46	0.220	
Most acceptable	4.29	28	3.89	28	3.71	28	3.71	28	4.64	11	2.26	0.067	
Fully acceptable	4.25	28	4.04	28	4.21	28	4.07	28	4.27	11	0.31	0.872	
Wholly acceptable	4.18	28	3.61	28	4.11	28	3.46	28	4.27	11	1.09	0.366	
Highly acceptable	4.07	28	3.71	28	3.75	28	3.96	28	3.91	11	0.34	0.853	
Quite acceptable	3.32	28	3.18	28	3.00	28	3.14	28	3.64	11	0.92	0.457	
Largely acceptable	3.21	28	2.50	28	2.36	28	2.32	28	3.27	11	1.43	0.228	
Acceptable	2.61	28	2.61	28	3.04	28	2.86	28	3.09	11	0.96	0.430	
Rather acceptable	2.54	28	2.39	28	2.36	28	2.00	28	2.00	11	1.47	0.215	
Pretty acceptable	2.46	28	2.39	28	2.54	28	2.25	28	2.91	11	1.88	0.119	
Reasonably acceptable	2.29	28	2.21	28	2.43	28	2.36	28	2.36	11	0.22	0.924	
Moderately acceptable	2.11	28	2.39	28	2.18	28	2.07	28	2.64	11	1.01	0.406	
Fairly acceptable	2.04	28	1.89	28	2.11	28	1.75	28	2.45	11	1.35	0.254	
Mildly acceptable	1.54	28	1.32	28	1.29	28	1.39	28	1.45	11	0.66	0.622	
Somewhat acceptable	1.46	28	1.50	28	1.36	28	0.96	28	1.45	11	1.55	0.193	
Mildly acceptable	1.39	28	1.07	28	1.36	28	1.36	28	1.82	11	1.77	0.139	
Slightly acceptable	1.14	28	1.11	28	0.96	28	0.96	28	1.18	11	1.07	0.375	
Sort of acceptable	1.14	28	1.04	28	1.14	28	1.04	28	1.18	11	0.28	0.888	
Barely acceptable	0.89	28	0.82	28	0.54	28	0.89	28	0.91	11	1.07	0.376	
Neutral	0.00	28	0.00	28	0.00	28	-0.04	28	0.00	11	0.84	0.500	
Borderline	-0.11	28	0.07	28	-0.11	28	-0.14	28	0.00	11	0.53	0.714	
Marginal	-0.18	28	-0.21	28	-0.18	28	-0.14	28	0.64	11	1.64	0.169	
Barely unacceptable	-1.07	28	-0.86	28	-0.89	28	-0.96	28	-1.09	11	0.79	0.534	
Slightly unacceptable	-1.25	28	-1.18	28	-1.14	28	-1.21	28	-1.36	11	0.42	0.792	
Somewhat unacceptable	-1.61	28	-1.75	28	-1.82	28	-1.79	28	-1.64	11	0.45	0.769	
Reasonably unacceptable	-2.14	28	-2.46	28	-2.79	28	-2.39	28	-2.55	11	1.69	0.157	
Fairly unacceptable	-2.21	28	-2.29	28	-2.32	28	-2.21	28	-2.36	11	0.16	0.957	
Moderately unacceptable	-2.39	28	-2.54	28	-2.57	28	-2.39	28	-2.64	11	0.45	0.771	
Pretty unacceptable	-2.82	28	-2.79	28	-2.86	28	-2.43	28	-3.55	11	3.04	0.020	X
Rather unacceptable	-2.89	28	-2.64	28	-2.29	28	-2.11	28	-2.27	11	3.75	0.007	X
Unacceptable	-2.93	28	-3.00	28	-3.82	28	-3.46	28	-3.91	11	3.58	0.009	X
Notably unacceptable	-3.18	28	-3.18	28	-3.61	28	-3.21	28	-3.64	11	1.74	0.146	
Considerably unacceptable	-3.57	28	-3.46	28	-3.64	28	-3.50	28	-3.73	11	0.21	0.933	
Largely unacceptable	-3.61	28	-3.86	28	-3.71	28	-3.36	28	-3.27	11	3.21	0.015	X
Quite unacceptable	-3.71	28	-2.86	28	-3.68	28	-3.36	28	-3.91	11	3.75	0.007	X
Substantially unacceptable	-3.82	28	-3.75	28	-3.82	28	-3.39	28	-3.45	11	2.00	0.099	
Decidedly unacceptable	-3.89	28	-3.57	28	-4.00	28	-3.68	28	-4.00	11	0.91	0.463	
Highly unacceptable	-4.29	28	-4.46	28	-4.32	28	-3.86	28	-4.00	11	1.82	0.130	
Highly unacceptable	-4.32	28	-4.50	28	-4.32	28	-4.18	28	-3.91	11	2.16	0.078	
Most unacceptable	-4.68	28	-4.21	28	-4.29	28	-4.04	28	-4.27	11	2.70	0.034	X
Exceptionally unacceptable	-4.71	28	-4.75	28	-4.79	28	-4.57	28	-4.73	11	0.82	0.513	
Very very unacceptable	-4.71	28	-4.54	28	-4.43	28	-4.39	28	-4.45	11	1.13	0.348	
Extremely unacceptable	-4.82	28	-4.82	28	-4.79	28	-4.68	28	-4.64	11	0.73	0.575	
Wholly unacceptable	-4.82	28	-4.32	28	-4.86	28	-4.54	28	-4.64	11	1.40	0.237	
Entirely unacceptable	-4.86	28	-4.93	28	-4.96	28	-4.79	28	-4.73	11	0.69	0.602	
Completely unacceptable	-4.93	28	-5.00	28	-4.86	28	-4.71	28	-5.00	11	2.44	0.051	
Totally unacceptable	-4.96	28	-4.96	28	-4.96	28	-4.93	28	-4.91	11	0.25	0.908	
Absolutely unacceptable	-4.96	28	-5.00	28	-5.00	28	-4.86	28	-5.00	11	2.71	0.033	X

* df(4,118)

The significant F_{PROB} values and Chi-square probabilities for working age personnel segmented by age are summarized in Table 48.

Table 48. Summary of significant F_{PROB} values and Chi-square probabilities for working age participants segmented by age*

	Acceptability	Adequacy	Goodness
Working age personnel segmented by age	8/50 (.073)	5/50 (.342)	5/41 (.245)

* Probabilities from Chi square calculations in parentheses

As shown in Table 48, the Chi-square probabilities reveal the lack of significant differences between ratings generated by sub groups of working age participants segmented by age. The differences in ratings of acceptability, adequacy, and relative goodness response alternatives cannot be attributed to factors beyond chance.

Where the ANOVAs revealed significant omnibus F values, pairwise post hoc comparisons were conducted to reveal any significant differences between the subgroups. To control for familywise error, either a Bonferoni or Tamhane correction was used depending upon if the variance was homogeneous, as revealed by the Levene statistic. Table 49 shows the number of significant pairwise comparisons for working age participants. See Appendix AE for the full list of significant pairwise comparisons for working age personnel segmented by age.

Table 49. Number of significant pairwise comparisons for working age participant age subgroups

	23-32 vs. 33-42	23-32 vs. 43-52	23-32 vs. 53-62	23-32 vs. 63-72	33-42 vs. 43-52	33-42 vs. 53-62	33-42 vs. 63-72	43-52 vs. 53-62	43-52 vs. 63-72	53-62 vs. 63-72
Acceptability	1	1	2	0	1	1	0	0	0	1
Adequacy	0	0	0	0	0	0	0	1	0	0
Goodness	0	0	1	0	0	0	0	1	0	0

As illustrated in the above table, a consistent pattern of significant differences between specific subgroups is not apparent.

Variability differences. To determine if variability differences existed for ratings provided by working age personnel segmented by age, the Levene values from the previous section were evaluated. The evaluation revealed 13 significant Levene values for the acceptability list, 16 significant values for the adequacy list, and 17 significant values for the relative goodness list ($F_{\text{CRIT}}(4,118) = 2.46, p=.05$), see Appendix AF. A Chi-square analysis was performed (Table 50) to determine if the number of significant Levene values was above chance.

Table 50. Distribution of significant Levene values and associated Chi-square probabilities for working age participants segmented by age*

	Acceptability	Adequacy	Goodness
Working age personnel segmented by age	13/50 (.004)	16/50 (.001)	17/41 (.001)

*Probabilities from Chi square calculations in parentheses

The analysis revealed a significant number of differences in the variability of responses provided by working age personnel segmented by age on the acceptability, adequacy, and relative goodness lists.

Comparison of Ratings by Working Age Participants Segmented by Education Level

A similar procedure as described in the Working Age Technical Staff and Managers was used to distribute participants' results into the appropriate groups. Education groups were segmented into three groups based upon highest degree completed (high school & associates, bachelors, masters & PhD.) The high school & associates category contained the smallest number of valid response, thus they were combined resulting 26 response sets. Twenty-six response sets were then randomly selected from the bachelors and graduate groups. By using the same number of response sets, comparisons between working age participants' responses segmented by education level will be more resistant to problems encountered with unequal sample sizes.

Mean rating differences. Calculation of the omnibus *F* revealed significant differences between 12% of the working age personnel responses segmented by education level (6 out of 50 response alternatives) on the acceptability list, 6% of the responses (3 out of the 50 response alternatives) on the adequacy list, and 7% of the responses (3 out of 41 response alternatives) on the goodness list. Table 51 shows the results of the ANOVA for working age participants segmented by education level on the acceptability list. The results are sorted in descending order based upon mean values generated by the high school & associates group. The results of the ANOVA for working age participants segmented by education level on the adequacy and relative goodness lists can be found in Appendix AG.

Table 51. Comparison of the acceptability response alternative values for working age participants segmented by education level

Descriptor	HS & Associates		Bachelors		Graduate		F*	F _{PROB}	Sig
	Mean	N	Mean	N	Mean	N			
Extremely acceptable	4.77	26	4.31	26	4.27	26	1.01	0.369	
Highly acceptable	4.19	26	3.96	26	3.77	26	0.92	0.405	
Fully acceptable	4.19	26	4.04	26	4.46	26	1.61	0.206	
Completely acceptable	4.15	26	4.46	26	4.62	26	0.79	0.457	
Very very acceptable	4.12	26	4.23	26	4.35	26	0.19	0.826	
Most acceptable	3.77	26	3.88	26	4.08	26	0.66	0.519	
Wholly acceptable	3.69	26	3.96	26	4.46	26	2.11	0.129	
Quite acceptable	3.12	26	3.19	26	3.12	26	0.03	0.970	
Largely acceptable	2.81	26	3.08	26	2.88	26	0.22	0.803	
Pretty acceptable	2.50	26	2.19	26	2.62	26	2.19	0.120	
Moderately acceptable	2.35	26	2.35	26	2.27	26	0.12	0.890	
Rather acceptable	2.19	26	2.38	26	1.88	26	1.28	0.284	
Reasonably acceptable	2.12	26	2.42	26	2.38	26	0.82	0.446	
Acceptable	1.96	26	2.46	26	3.08	26	5.78	0.005	X
Fairly acceptable	1.69	26	1.88	26	2.08	26	1.06	0.352	
Mildly acceptable	1.54	26	1.46	26	1.42	26	0.13	0.881	
Mildly acceptable	1.46	26	1.42	26	1.35	26	0.21	0.814	
Somewhat acceptable	1.27	26	1.42	26	1.31	26	0.20	0.820	
Slightly acceptable	1.15	26	1.19	26	0.92	26	2.15	0.124	
Sort of acceptable	1.00	26	1.00	26	1.08	26	0.14	0.871	
Barely acceptable	0.77	26	0.85	26	1.00	26	1.68	0.193	
Neutral	0.00	26	0.00	26	0.08	26	1.00	0.373	
Borderline	-0.04	26	-0.27	26	0.00	26	2.06	0.135	
Marginal	-0.08	26	-0.12	26	-0.12	26	0.03	0.968	
Barely unacceptable	-1.00	26	-1.12	26	-1.12	26	0.15	0.855	
Slightly unacceptable	-1.08	26	-1.23	26	-1.27	26	0.60	0.551	
Somewhat unacceptable	-1.46	26	-1.46	26	-1.92	26	2.62	0.079	
Fairly unacceptable	-1.96	26	-2.08	26	-2.62	26	5.28	0.007	X
Rather unacceptable	-2.08	26	-2.62	26	-2.46	26	2.26	0.112	
Moderately unacceptable	-2.19	26	-2.12	26	-2.35	26	0.29	0.748	
Reasonably unacceptable	-2.50	26	-2.42	26	-2.50	26	0.05	0.950	
Notably unacceptable	-2.69	26	-3.23	26	-3.62	26	8.68	0.000	X
Unacceptable	-2.69	26	-3.12	26	-3.88	26	6.31	0.003	X
Pretty unacceptable	-2.77	26	-2.54	26	-3.04	26	2.10	0.129	
Quite unacceptable	-3.23	26	-3.81	26	-3.69	26	3.93	0.024	X
Decidedly unacceptable	-3.23	26	-3.88	26	-4.00	26	3.68	0.030	X
Considerably unacceptable	-3.42	26	-3.58	26	-3.73	26	0.83	0.441	
Largely unacceptable	-3.65	26	-3.69	26	-3.73	26	0.08	0.928	
Substantially unacceptable	-3.96	26	-3.65	26	-3.92	26	1.23	0.299	
Most unacceptable	-3.96	26	-4.38	26	-4.35	26	1.69	0.191	
Highly unacceptable	-4.35	26	-4.38	26	-4.46	26	0.25	0.776	
Highly unacceptable	-4.46	26	-4.42	26	-4.27	26	0.84	0.434	
Exceptionally unacceptable	-4.50	26	-4.69	26	-4.81	26	1.81	0.171	
Very very unacceptable	-4.50	26	-4.50	26	-4.62	26	0.30	0.744	
Wholly unacceptable	-4.54	26	-4.62	26	-4.77	26	0.76	0.469	
Completely unacceptable	-4.85	26	-4.88	26	-4.88	26	0.07	0.937	
Entirely unacceptable	-4.88	26	-4.92	26	-4.96	26	0.39	0.681	
Totally unacceptable	-4.96	26	-4.88	26	-4.96	26	0.84	0.436	
Extremely unacceptable	-4.96	26	-4.77	26	-4.81	26	1.74	0.183	
Absolutely unacceptable	-5.00	26	-4.96	26	-4.92	26	1.03	0.363	

* df (2,75)

After an examination of the ANOVAs had revealed significant differences in response alternatives generated by working participants segmented by education level, the next step was to determine if the number of significant differences in mean values was beyond chance level. A Chi-square analysis was performed and the probabilities calculated based on the number of significant omnibus F values. The significant F_{PROB} values and Chi-square probabilities for working age personnel segmented by education level are summarized in Table 52.

Table 52. Summary of significant F_{PROB} values and Chi-square probabilities for working age participants segmented by education level*

	Acceptability	Adequacy	Goodness
Working age personnel segmented by education level	6/50 (.209)	3/50 (.826)	3/41 (.663)

* Probabilities from Chi square calculations in parentheses

As shown in Table 52, the Chi-square probabilities reveal the lack of significant differences between ratings generated by subgroups of working age participants segmented by education level. The differences in ratings of acceptability, adequacy, and relative goodness response alternatives cannot be attributed to factors beyond chance.

Where the ANOVAs revealed significant omnibus F values, pairwise post hoc comparisons were conducted to reveal any significant differences between the subgroups. To control for familywise error, either a Bonferoni or Tamhane correction was used depending upon if the variance was homogeneous, as revealed by the Levene statistic. Table 53 shows the number of significant pairwise comparisons for working age participants. (See Appendix AH for the full list of significant pairwise comparisons for working age personnel segmented by education level.)

Table 53. Number of significant pairwise comparisons for working age participant education level subgroups

	HS & Assoc vs. Bachelors	HS & Assoc vs. Graduate	Bachelors vs. Graduate
Acceptability	1	4	2
Adequacy	3	0	0
Goodness	2	2	0

The results of the Chi-square did not reveal a significant number of differences for response alternatives rated by participants within different education groups (Table 53).

Variability differences. To determine if variability differences existed for ratings provided by working age personnel segmented by education level, the Levene values from the previous section were evaluated. The evaluation revealed 11 significant Levene values for the acceptability list, 7 significant values for the adequacy list, and 9 significant values for the relative goodness list ($F_{\text{CRIT}}(2,75) = 3.15, p=.05$), see Appendix AI. A Chi-square analysis was performed (Table 54) to determine if the number of significant Levene values was above chance.

Table 54. Distribution of significant Levene values and associated Chi-square probabilities for working age participants segmented by education level*

	Acceptability	Adequacy	Goodness
Working age personnel segmented by education level	11/50 (.013)	7/50 (.125)	9/41 (.024)

*Probabilities from Chi square calculations in parentheses

The analysis revealed a significant number of differences in the variability of responses provided by working age personnel segmented by education level on the acceptability and relative goodness lists. There were not a significant number of differences on the adequacy list.

CHAPTER IV

DISCUSSION

The organization of this section is similar to Chapter Three: beginning with intrasubject response consistency, continuing with a summary of the group comparisons, and followed by detailed discussions of each group and subgroup. These comparisons detail findings and possible reasons for differences in mean ratings, variability, and response alternative order. After the group and subgroup comparisons, the scale development strategies for the working age population are detailed. Finally, conclusions are presented summarizing the overall findings and recommendations of the study.

The five objectives of this study were to:

1. Determine if the differences in response alternative ratings reported by Krsacok and Moroney (2002) exist when comparing US Army personnel with working age males, and if differences exist when comparing college males and females with working age males and females.
2. Determine if the consistency across sex found by Krsacok and Moroney exists when comparing males and females of a working age population.
3. Determine if differences in response alternative ratings exist for different groups of the working age population segmented by occupation level, age, and education level.

4. Determine if the order of descriptors generated by a working age population is consistent with the orders of descriptors generated by both college students and US Army personnel.
5. Determine if there is a tendency for college students (Krsacok and Moroney, 2002) or working age personnel to generate more extreme mean ratings, as well as more positive ratings.

Intrasubject Response Consistency

While the stability of response alternative ratings across different groups and subgroups at different times is of primary interest in the current study, consistent responses from participants are required. The intrasubject response consistency was evaluated by repeating several response alternatives within and between the lists of acceptability, adequacy, and relative goodness. The repeated response alternatives were the same as used by Matthews et al. (1978) and Krsacok (2001). Following the procedure used by Krsacok, the data from the working age population was divided by sex into males and females when evaluating the descriptive statistics and intrasubject response consistency.

The values assigned to the response alternatives repeated within the acceptability list generated by both working age males and females were fairly reliable. The differences between the first and second mean ratings varied from 0.02 to 0.15, while the standard deviations varied from 0.02 to 0.73 (Table 14 & Table 15). The standard deviation for the first and second rating of "highly unacceptable" generated by working age females differed by 0.75 primarily due to one outlier that made a sign error. As previously stated, to remain consistent with previous studies, outliers were left in the data if a participant's response set did not contain more than three sign errors. *T*-tests did not

indicate any significant differences between the first and second ratings of any response alternatives generated by working age males or working age females (Table 16).

For the response alternatives repeated between lists ("neutral," "borderline," "marginal") intrasubject response consistency was very high as indicated by small differences between means and standard deviations for the ratings generated across the acceptability, adequacy, and relative goodness lists. The largest difference between the mean ratings was 0.03, and the largest difference between the standard deviations for the ratings was 0.14 (Table 14 & Table 15). The consistent ratings of the response alternatives both within and between the lists allows for further evaluation of the differences between responses generated by the groups (US Army males & working age males, college males & working age males, and college females & working age females) and subgroups (working age personnel segmented by sex, occupation level, age, and education level).

The following section describes the differences found in the group and subgroup comparisons. While Krsacok (2001) found differences in response alternative ratings generated by college samples and the US Army sample (Matthews et al., 1978), caution must be exercised before extending these findings to a working age population. The current group and subgroup comparisons replicate and extend the Krsacok findings by comparing response alternative ratings assigned by working age personnel to those assigned by college students and US Army personnel as well as analyzing comparisons within the working age population.

Group Comparisons

The results from the current study are grouped into two categories: group and subgroup comparisons. The group comparisons analyzed the responses generated by a working age sample compared with four other groups: US Army sample (Matthews et al., 1978), college student sample, college male sample, and a college female sample (Krsacok, 2001). As shown in Table 55, the percent of significantly different mean responses generated by working age males and US Army personnel is large for the acceptability response alternatives, but not for the adequacy or relative goodness response alternatives. This suggests that for both Army personnel and working age males there is consistency of connotative meanings for the adequacy and relative goodness response alternative lists despite the almost 30 year interval between data collection.

In addition, a very large number of significantly different responses were generated by working age males compared to college males as well as working age females compared to college females (values ranged from 13/50 to 15/41, 26% and 37%, respectively). Comparing the working age personnel and college student samples as a whole also revealed large consistent significant differences. These large differences in ratings suggest that differences in subject factors between these groups substantially affected the connotative meanings of the response alternatives used in all three lists. These findings agree with those of previous studies—Peterson (2001), Moroney and Reising (1992), and Bass (1968)—where results generated by student samples differed from results generated by non-student samples.

Table 55. Summary of the number of significantly different mean responses between different groups and sub-groups

Between Group Comparisons	Acceptability	Adequacy	Goodness
Working age males and US Army personnel	12/50 (24%)**	8/50 (16%)	6/41 (15%)
Working age males and college males	14/50 (28%)**	13/50 (26%)**	15/41 (37%)***
Working age females and college females	13/50 (26%)**	17/50 (34%)***	13/41 (32%)**
Working age personnel and college students	22/50 (44%)***	19/50 (38%)***	13/41 (32%)**
Within Working Age Subgroup Comparisons			
Working age males and working age females	8/50 (16%)	8/50 (16%)	5/41 (12%)
Working age technical staff and managers	2/50 (4%)	3/50 (6%)	2/41 (5%)
Working age personnel segmented by age	8/50 (16%)	5/50 (10%)	5/41 (12%)
Working age personnel segmented by education level	6/50 (12%)	3/50 (6%)	3/41 (7%)

*Indicates a significant Chi-square probability <.05

**Indicates a significant Chi-square probability <.01

***Indicates a significant Chi-square probability <.001

The data from the working age subgroups were analyzed to determine if different subject characteristics within the working age population would be related to different ratings of the response alternatives. Specifically, ratings generated by subgroups segmented by sex, occupation level, age, and education level were analyzed to determine if significant differences existed. As shown in Table 55, the percentages of significant

differences per list varies from 4% to 16%, however these differences did not exceed chance. The similarity of ratings generated by males and females agrees with the consistency across sex groups found by Krsacok (2001).

Comparisons of the variability differences between all the groups and subgroups reveal considerable heterogeneity of variance, see Table 56 where the numerator is the number of significant F_{MAX} and/or Levene values and the denominator is the number of items on the list. Chi-square tests performed to determine if the number of significant differences in variability of ratings between the groups and subgroups could not be attributed simply to chance show that for most lists the comparisons were significant. Because the significant comparisons between the ratings generated by different groups and subgroups include both time between studies and differences in subject factors, the large amount of heterogeneity of variance cannot be attributed to one single factor.

Table 56. Summary of the number of significant differences in response variability between different groups and sub-groups

Between Group Comparisons	Acceptability	Adequacy	Goodness
Working age males and US Army personnel	20/50 (40%)*	12/50 (24%)*	16/41 (39%)*
Working age males and college males	16/50 (32%)*	16/50 (32%)*	12/41 (29%)*
Working age females and college females	15/50 (30%)*	22/50 (44%)*	4/41 (10%)
Working age personnel and college students	14/50 (28%)*	18/50 (36%)*	9/41 (22%)*
Within Working Age Subgroup Comparisons			
Working age males and working age females	16/50 (32%)*	19/50 (38%)*	8/41 (20%)*
Working age technical staff and managers	11/50 (22%)*	12/50 (24%)*	9/41 (22%)*
Working age personnel segmented by age	13/50 (26%)*	16/50 (32%)*	17/41 (41%)*
Working age personnel segmented by education level	11/50 (22%)*	7/50 (14%)	9/41 (22%)*

*Indicates a significant Chi-square probability <.05

**Indicates a significant Chi-square probability <.01

***Indicates a significant Chi-square probability <.001

Despite the significant differences in mean values and variability, the ordering of the response alternatives based upon ratings from the each of the groups and subgroups was very similar. As can be seen from Table 57 the intercorrelations were almost unity. Neither time between the studies nor subject variables (student – non-student status, sex, age, education, or occupation level) resulted in different orders of response alternative

ratings. Therefore, the topic of response alternative order will not be discussed in the following sections and the fourth hypothesis (stability of response alternative order) was confirmed.

Table 57. Correlations between acceptability, adequacy and goodness response alternatives across groups and subgroups

	Acceptability	Adequacy	Goodness
Between Group Comparisons			
Working age males and US Army personnel	0.997	0.997	0.998
Working age males and college males	0.996	0.997	0.991
Working age females and college females	0.996	0.998	0.997
Working age personnel and college students	0.996	0.997	0.997
Within Working Age Subgroup Comparisons			
Working age males and working age females	0.998	0.999	0.998
Working age technical staff and managers	0.998	0.999	0.998
Working age personnel segmented by age	NC	NC	NC
Working age personnel segmented by education level	NC	NC	NC

NC=No correlation generated because there were more than two levels of the factor

Overall, the ratings on scales of acceptability, adequacy, and relative goodness generated by working age participants differed significantly from the ratings generated by the college samples five years prior. Conversely, the response alternative ratings generated by US Army personnel almost 30 years prior differed significantly on one of

the scales, acceptability, but not the other two. Given the lack of significant differences in response alternative ratings generated by different working age sample subgroups, and the relatively few significant differences between the working age male and US Army samples, the current results suggest the differences between student and non-student samples contribute more to differences in connotative meaning than either time or other subject factors. With the exception of the ordering of response alternatives, comparisons specific to each group and subgroup are discussed in detail in the following sections.

Comparison of Ratings by Working Age Males and US Army Personnel

Mean rating differences. A key objective of the working age males and US Army personnel (Matthews et al., 1978) analysis was to determine if there were significant differences in numerical ratings generated by these two groups. As shown in Table 55, significant differences were found between 24% of the acceptability ratings, 16% of the adequacy ratings, and 15% of the relative goodness ratings generated by working age males compared with ratings generated by US Army personnel. The Chi-square analysis conducted to test whether the number of significant differences could be expected due to chance alone revealed that only the ratings for the acceptability list were significant. Finding a significant number of differences on one list and not the other two suggests the connotative values generated by these two samples are somewhat similar even though they were generated almost 30 years apart. These similarities may have been enhanced by the fact that the working age population consists of a small number of retired military personnel.

Mean ratings generated by working age participants and US Army personnel (Matthews et al. 1978) did not reveal consistent differences in mean rating or response

alternative order. Krsacok and Moroney (2002) found significant differences across all three lists in mean ratings generated by college males and US Army personnel and attributed these differences to either the time elapsed between studies or subject factors. Several researchers investigating differences in connotative scale meanings over time have found fairly consistent ratings. Simpson (1963) found stability in scale ratings over 20 years, Budescu and Wallsten (1985) found stability over 22 years and Dumas et al. (2002) found stability over 34 years. Similar to these studies, the current results suggest the connotative meanings for response alternatives of adequacy and relative goodness have not significantly changed over the past 28 years. However, the significant differences between ratings generated by working age males and US Army personnel for acceptability response provide conflicting results.

Comparison of Ratings by Working Age Males and College Males

Mean Rating Differences. A key objective of the working age males and college males (Krsacok, 2001) analysis was to determine if there were significant differences in numerical ratings generated by these two groups. As shown in Table 55, 28% of the acceptability ratings, 26% of the adequacy ratings, and 37% of the relative goodness ratings generated by working age males were significantly different from ratings generated by college males. The Chi-square analysis revealed significant differences in ratings for all three lists. The consistent significant findings across the multiple sample draws (Table 22, Table 23, and Table 24) illustrate consistency of ratings generated by different samples of working age males. These findings illustrate that the connotative values assigned by college males (Krsacok) five years ago are different than the connotative values assigned by working age males in the current study. Given the lack of

consistent significant findings between ratings generated by working age males and US Army personnel (Matthews et al., 1978) as shown in Table 55, the rating differences between college age males and working age males are likely due to subject factors.

Regarding the direction of the mean differences, the binomial analysis (Table 25) revealed a significantly greater number of extreme ratings (larger absolute values) generated by college males than working age males on the adequacy list. The differences in the acceptability and relative goodness lists were neither consistent nor significant. Therefore, there is not enough evidence to draw inferences on the tendency for either group to assign extreme values. However, the binomial analysis examining the tendency for one group to assign more positive mean ratings to response alternatives reveals a consistent trend of college males rating acceptability and adequacy response alternatives significantly higher than working age males (Table 26). College males also rated relative goodness response alternatives higher, although this was not a significant difference.

Mean ratings generated by working age males and college males (Krsacok & Moroney, 2002) were consistently different. Krsacok and Moroney found significant differences across all three lists in mean ratings generated by college males and US Army personnel and attributed these differences to either the time elapsed between studies or subject factors. Several researchers have found differences in experimental results and questionnaire responses between student and non-student samples. A comprehensive meta-analysis by Peterson (2001) found that the results derived from college participants' differed in size and direction compared with non-students. Peterson found that "... in nearly one-of-five relationships studied, a conclusion based on a college student subjects may have differed directionally from one based on non-student subjects." Moroney and

Reising (1992) described performance differences and motivations among different types of study participants: students, company volunteers, non-volunteers, and system operators. Given that only five years separate the current study and the Krsacok and Moroney study, as well as the amount of research illustrating differences for student and non-student samples, the observed differences in ratings generated by working age males and college males were likely due to underlying factors associated with student/non-student status.

Comparison of Ratings by Working Age Females and College Females

Mean rating differences. A key objective of the working age females and college females (Krsacok, 2001) analysis was to determine if there were significant differences in numerical ratings generated by these two groups. As shown in Table 55, significant differences were found between 26% of the acceptability ratings, 34% of the adequacy ratings, and 32% of the relative goodness ratings generated by working age females compared with ratings generated by college females. The Chi-square analysis revealed significant differences in ratings for all three lists. The consistent significant findings across the multiple sample draws (Table 30, Table 31, and Table 32) illustrate the consistency of ratings generated by different samples of working age females.

These findings lead the author to conclude that the connotative values assigned by college females (Krsacok) five years ago are different than the connotative values assigned by working age females in the current study. Similar to the working age males and college males comparison as shown in Table 55, the rating differences between college age females and working age females are likely due to differences in subject factors associated with students and non-students.

Regarding the number of mean differences, the binomial analysis of these data (Table 33) did not reveal any significant differences in the direction of more extreme ratings between the two groups. However, the binomial analysis examining the tendency for one group to assign more positive mean ratings to response alternatives reveals a trend for college females to rate adequacy response alternatives significantly higher and acceptability response alternatives marginally higher (Table 34).

Mean ratings generated by working age females and college females (Krsacok & Moroney, 2002) were consistently different in mean rating. As discussed in the working age males and college males analysis, several researchers have found differences in experimental results and questionnaire response between student and non-student samples. Given that only five years separate the current study and the Krsacok and Moroney study, as well as the amount of research illustrating differences for student and non-student samples, the observed differences in ratings generated by working age females and college females were likely due to differences in subject factors associated with student/non-student status.

Comparison of Ratings by Working Age Personnel and College Students

As will be shown in the following section entitled Comparison of Ratings by Working Age Males and Working Age Females, mean ratings produced by working age males and females did not differ significantly. Because differences did not exist between working age male and female mean ratings, their data were collapsed. In addition, since Krsacok (2001) did not find significant differences between ratings generated by college males and females, the college student data were also collapsed. Thus, to ensure that the differences found between working age males and college males, as well as working age

females and college females could be generalized to the larger sample, the entire college student sample was compared with a proportionate number from the working age sample.

Mean rating differences. A key objective of the working age personnel and college students (Krsacok, 2001) analysis was to determine if there were significant differences in numerical ratings generated by these two groups. As shown in Table 55, significant differences were found between 44% of the acceptability ratings, 38% of the adequacy ratings, and 32% of the relative goodness ratings generated by working age personnel compared with ratings generated by college students. The Chi-square analysis revealed significant differences in ratings for all three lists. These findings illustrate that the connotative values assigned by college students (Krsacok) five years ago are different than the connotative values assigned by working age personnel in the current study. Similar to the comparisons of working age personnel and college students segmented by sex as shown in Table 55, the mean rating differences generated are likely due to differences in subject factors associated with student and non-student samples.

Regarding the direction of the mean differences, the binomial analysis of these data (Table 38) revealed a significantly greater number of extreme ratings generated by college students on the adequacy list. The differences in the acceptability and relative goodness lists were neither consistent nor significant. Therefore, there is not enough evidence to draw inferences regarding a tendency for either group to assign extreme values. However, the binomial analysis examining the tendency for one group to assign more positive mean ratings to response alternatives reveals a consistent trend of college personnel rating acceptability and adequacy response alternatives significantly higher (Table 39). The tendency for working age personnel to generate more negative mean

ratings for response alternatives on the acceptability and adequacy lists further illustrates the impact of different subject factors on ratings of response alternatives by working age personnel and college students.

Mean ratings responses generated by working age personnel and college students (Krsacok & Moroney, 2002) were consistently different in mean rating. As discussed in the working age males and college males analysis, several researchers have found differences in experimental results and questionnaire response values between student and non-student samples. Similar to the working age personnel and college students' comparisons segmented by sex differences, the observed differences in mean ratings generated by working age personnel and college students were likely due to differences in subject factors associated with student and non-student status.

Comparison of Ratings by Working Age Males and Working Age Females

Mean rating differences. A key objective of the working age males and working age females (Krsacok, 2001) analysis was to determine if there were significant differences in numerical ratings generated by these two groups. As shown in Table 55, significant differences were found between 16% of the acceptability ratings, 16% of the adequacy ratings, and 12% of the relative goodness ratings generated by working age males compared with ratings generated by working age females. The Chi-square analysis revealed no significant differences in ratings for all three lists. These findings illustrate that the connotative values assigned by working age males and working age females are similar and not influenced by the sex of the participants. These results agree with Krsacok who found similar response alternative ratings, illustrated by a lack of significant differences generated by college males and college females.

Mean ratings generated by working age males and working age females did not reveal significant differences in mean ratings or response alternative ordering. Similar to Krsacok's (2001) findings, populations divided into groups based upon sex produced similar mean ratings for response alternatives of acceptability, adequacy, and relative goodness. These findings are consistent with the findings of Simpson (1963) and Dumas et al. (2002) that suggest males and females from similar populations produce similar ratings for questionnaire response alternatives.

Comparison of Ratings by Working Age Technical Staff and Managers

In an effort to specify subject factors which could influence a participant's ratings of response alternatives, the working age population was divided into several other subgroups, one of which was working age technical staff and managers.

Mean rating differences. A key objective of the working age technical staff and managers analysis was to determine if there were significant differences in numerical ratings generated by these two groups. As shown in Table 55, significant differences were found between only 4% of the acceptability ratings, 6% of the adequacy ratings, and 5% of the relative goodness ratings generated by working age technical staff compared with ratings generated by managers. The Chi-square analysis revealed no significant differences in ratings for all three lists. These findings illustrate that the connotative values assigned by working age technical staff and managers are similar and not influenced by the occupation level of the participants.

Mean ratings generated by working age technical staff and managers did not reveal significant differences in mean ratings or response alternative ordering. Earlier

research by Bass et al. (1968) found significant differences in responses to an organizational questionnaire between students and upper-middle managers. While this comparison was between students and managers, and the differences were partially due to the varying domain experiences of the samples, Bass et al.'s findings illustrate differences between managers and other groups. Surprisingly, the very low percentage of significant differences (Table 55) in mean ratings of response alternatives between working age technical staff and managers in the current study suggests that occupation level does not contribute to differences in response alternative ratings.

Comparison of Ratings by Working Age Participants Segmented by Age

Mean rating differences. The first objective of the working age participants segmented by age analysis was to determine if there were significant differences in numerical ratings generated by the different subgroups. As indicated previously, participants' responses were segmented by 10 year intervals: 23-32, 33-42, 43-52, 53-62, 63-72. As shown in Table 55, significant differences were found between 16% of the acceptability ratings, 10% of the adequacy ratings, and 12% of the relative goodness ratings generated by different age subgroups. For the response alternatives with a significant omnibus F, post hoc analyses were conducted to determine if any subgroups accounted for a disproportionate amount of the significant differences (Table 49). The post hoc analyses revealed such a broad distribution of significant differences between the subgroups, thus no conclusions could be drawn about the response alternatives ratings assigned by the age subgroups.

The Chi-square analysis revealed no significant differences among ratings for all three lists. These findings further illustrate that the connotative values assigned by

working age participants segmented by age are similar and not influenced by the age of the participants. While the previous group and subgroup comparisons analyzed binomial probabilities and tested for order differences, this was not possible for the working age participants segmented by age analysis because there are more than two groups.

While there is little research specifically addressing differences in response alternative ratings by age groups, age is an underlying factor in many of the other comparisons. Age is likely an underlying factor in previous research investigating differences in responses between students and non-students (Peterson, 2001) as well as MBA students compared to undergraduate and High School students (Bass et al., 1974). Given conflicting results from studies on the effect of different subject factors related to age on experimental and questionnaire results, the lack of a significant number of differences was surprising and indicates the need for further studies in this area.

Comparison of Ratings by Working Age Participants Segmented by Education Level

Mean rating differences. A key objective of the working age participants segmented by education level analysis was to determine if there were significant differences in numerical ratings generated by the different subgroups. As previously indicated, participants' responses were segmented into three subgroups: High School & Associates, Bachelors, and Graduate degrees. As shown in Table 55, significant differences were found between only 12% of the acceptability ratings, 6% of the adequacy ratings, and 7% of the relative goodness ratings generated by different age subgroups. For the response alternatives with a significant omnibus F, post hoc analyses were conducted to determine if any subgroups accounted for a disproportionate amount of significant differences (Table 53). The post hoc analyses did not reveal a pattern in the

distribution of significant differences between the subgroups, thus no conclusions could be drawn between education level and ratings generated for response alternatives.

The Chi-square analysis did not reveal any significant differences in ratings for all three lists. These findings further illustrate that the connotative values assigned by working age participants segmented by education level are similar and not influenced by the education level of the participants. Similar to the working age personnel segmented by age analysis, examination of binomial probabilities and tests for order differences were not possible for the working age participants segmented by education level analysis because there are more than two groups.

Previous research (Bass et al., 1974) investigating differences in response alternative ratings between students with different levels of education (MBA students compared to undergraduate and High School students) found similar response ratings between the student groups. The lack of significant differences in mean ratings generated by different subgroups segmented by education level in the current study is consistent with the findings of Bass et al.

The Use of Extreme and Positive Ratings by College Students and Working Age Personnel

Student and working age groups with a significant number of mean differences across all three lists were evaluated to see if either group generated more extreme ratings. An examination of Table 58 does not reveal any trend for students or non-students to generate more extreme response alternative ratings.

Table 58. Summary of extreme significant mean values and associated binomial probabilities

Extreme Significant Means			
	Working age males	College males	p
Acceptability	6	8	.791
Adequacy	2	11	.022
Goodness	10	4	.118
	Working age females	College females	
Acceptability	7	6	1.000
Adequacy	5	12	.143
Goodness	9	6	.607
	Working age personnel	College students	
Acceptability	10	12	.832
Adequacy	2	17	.001
Goodness	8	5	.581

A second binomial analysis was conducted to determine if either student or non-students consistently produced more positive ratings. As illustrated in Table 59, college males, college females, and college students as a whole consistently produced significantly higher ratings for acceptability and adequacy response alternatives.

Table 59. Summary of higher significant mean values and associated binomial probabilities

Higher Significant Means			
	Working age males	College males	p
Acceptability	0	14	.000
Adequacy	1	12	.004
Goodness	6	9	.607
	Working age females	College females	
Acceptability	3	10	.092
Adequacy	2	15	.002
Goodness	7	8	1.000
	Working age personnel	College students	
Acceptability	4	18	.004
Adequacy	2	17	.001
Goodness	6	7	1.000

The tendency for working age personnel to generate more negative response alternatives ratings—likewise, the tendency for college students to rate response alternatives more positively than working age personnel—may be attributed to subject factors associated with student/non-student status. The persistent differences in response alternative ratings between college students and working age personnel limit the use of scales developed by Krsacok (2001) for working age personnel.

Development of Rating Scale Response Alternative Sets for a Working Age Population

In 2001 Peterson suggested that, “At a minimum, research results based on college students need to be replicated with non-student subjects prior to the generation of universal principles.” Based on the findings of this study, that was good advice for the mean ratings generated by college males and females for response alternatives on all three lists of acceptability, adequacy, and relative goodness differed significantly from mean ratings generated by working age males and females. Therefore, a new series of

response alternative scales designed to reflect the connotative values of the working age population was developed.

Both Matthews et al. (1978) and Krsacok (2001) used the results of their analysis to generate sets of response alternatives useful to survey creators. Generally speaking, researchers analyze data from surveys assuming equidistant scale increments. To ensure the use of equidistant increments, survey scales must be generated from an understanding of the quantitative meanings the target sample attributes to each response alternative. While there were minimal significant differences between the mean ratings generated by the US Army males (Matthews et al.) and the working age males, there were no females represented in their sample. In addition, the response alternative sets generated by Krsacok should not be applied to a working age population because the mean ratings produced by working age personnel and college students significantly differed on all three lists. Therefore, survey scales based specifically on a working age sample were generated using the data from the present study.

This section describes the techniques and rational behind the generation of the working age personnel response alternative scales. Because working age males and working age females did not produce mean ratings that were significantly different, and because many surveys are distributed to both males and females, data produced by a larger portion of the whole working age sample was used to develop these scales. The sample size was increased to $n=299$ by including previously excluded response sets with up to six sign errors. Because the scale generation was not comparing data to previous studies, sign error corrections were made to improve the quality of the data.

Before the scales were generated, several elimination criteria were applied to ensure the response alternative were suitable. First, highly variable response alternatives (i.e. those with a $SD \geq 1.00$) were eliminated from the data set (Table 60). For a working age population, survey developers are discouraged from using these response alternatives because of the apparent disagreement in quantitative meanings indicated by high SDs. Second, the six response alternative pairs repeated within the lists to test intra-subject response consistency were identified and one member of the pair was eliminated. This was possible because there was no significant difference between the mean numeric ratings for the first and second presentation of these alternatives.

Table 60. Highly variable response alternatives excluded from the working age personnel survey scales

Response Alternative	Mean Rating	SD
Wholly acceptable	4.06	1.02
Most acceptable	3.87	1.03
Acceptable	2.53	1.27
Unacceptable	-3.35	1.23
Exceptionally adequate	4.27	1.00
Totally adequate	4.22	1.03
Absolutely adequate	4.17	1.09
Entirely adequate	4.01	1.10
Completely adequate	3.93	1.29
Fully adequate	3.89	1.08
Wholly adequate	3.79	1.20
Perfectly adequate	3.66	1.23
Most adequate	3.60	1.19
Conspicuously better	2.64	1.03
Absolutely alike	1.20	1.91
Worse	-2.51	1.07

The remaining response alternatives were used to generate the scales in the current study. Survey developers should find these quantitative lists useful for generating

additional scales. The list of acceptability response alternatives encouraged for use with a working age population can be seen in Table 61. Comparable adequacy and relative goodness lists can be found in Appendix AB.

Two separate scale generation techniques were used, namely the Balanced Numeric Values and Balanced Terms methods. These methods are similar to ones described by Krsacok (2001) with techniques focusing less on standard deviation separation and more on equidistant increments. Each technique is described separately below.

Balanced Numeric Values

The scales generated using the Balanced Numeric Values method attempt to use response alternatives with approximately equal absolute values on the positive and negative side of the scale. Before response alternatives were selected, each scale was incremented based upon the number of scale points and the mean value of the positive and negative end points. The end points were selected by choosing the most positive response alternative and matching the negative term with the closest absolute mean value. Dividing the difference between the end points by 1-the number of scale points provided the desired scale increment values. Finally, the response alternatives were selected with a mean rating as close as possible to the desired values. Neutral was chosen as the midpoint because the mean rating was closest to zero and the SD was very small.

Table 61. Acceptability response alternatives for working age personnel scale generation

Response Alternative	Mean	SD
Extremely acceptable	4.48	0.71
Completely acceptable	4.41	0.84
Very very acceptable	4.22	0.82
Fully acceptable	4.13	0.95
Highly acceptable	4.03	0.64
Quite acceptable	3.12	0.84
Largely acceptable	3.09	0.83
Pretty acceptable	2.36	0.78
Reasonably acceptable	2.26	0.82
Rather acceptable	2.26	0.87
Moderately acceptable	2.25	0.71
Fairly acceptable	1.99	0.80
Somewhat acceptable	1.48	0.69
Mildly acceptable	1.43	0.67
Sort of acceptable	1.10	0.57
Slightly acceptable	1.09	0.42
Barely acceptable	1.04	0.52
Neutral	-0.02	0.21
Borderline	-0.13	0.58
Marginal	-0.21	0.93
Slightly unacceptable	-1.20	0.51
Barely unacceptable	-1.21	0.66
Somewhat unacceptable	-1.78	0.76
Fairly unacceptable	-2.31	0.80
Moderately unacceptable	-2.41	0.77
Rather unacceptable	-2.44	0.87
Reasonably unacceptable	-2.51	0.79
Pretty unacceptable	-2.75	0.83
Notably unacceptable	-3.27	0.92
Quite unacceptable	-3.50	0.82
Considerably unacceptable	-3.58	0.77
Largely unacceptable	-3.63	0.69
Substantially unacceptable	-3.66	0.76
Decidedly unacceptable	-3.86	0.89
Most unacceptable	-4.19	0.89
Highly unacceptable	-4.29	0.63
Very very unacceptable	-4.51	0.64
Wholly unacceptable	-4.66	0.64
Exceptionally unacceptable	-4.71	0.54
Extremely unacceptable	-4.80	0.42
Completely unacceptable	-4.84	0.48
Entirely unacceptable	-4.85	0.45
Totally unacceptable	-4.90	0.36
Absolutely unacceptable	-4.92	0.32

The five-point acceptability scale (Table 62) includes the desired values resulting from incrementing the scale into equidistant portions. The mean values associated with the response alternatives in Table 61 were selected to match the desired values.

Table 62. Five-point acceptability scale generated using the Balanced Numeric Values method

Desired value	Response Alternative	Mean	SD
4.48	Extremely acceptable	4.48	0.71
2.23	Reasonably acceptable	2.26	0.82
-0.01	Neutral	-0.02	0.21
-2.26	Fairly unacceptable	-2.31	0.80
-4.51	Very very unacceptable	-4.51	0.64

While Table 61 provides explicit mean values for the response alternatives, the author has taken flexibility when generating the scales. Although the five-point acceptability scale (Table 62) uses “very very unacceptable” for the negative end point, the author feels this term may not be common enough to warrant its use in a survey scale. Therefore, the seven-point acceptability scale (Table 63) uses wholly unacceptable for the negative endpoint although very very unacceptable has an absolute mean rating closer to extremely acceptable.

Table 63. Seven-point acceptability scale generated using the Balanced Numeric Values method

Response Alternative	Mean	SD
Extremely acceptable	4.48	0.71
Largely acceptable	3.09	0.83
Mildly acceptable	1.43	0.67
Neutral	-0.02	0.21
Somewhat unacceptable	-1.78	0.76
Notably unacceptable	-3.27	0.92
Wholly unacceptable	-4.66	0.64

Using the Balanced Numeric Values method described in this section, scales of 5, 6, 7, 8, 9, and 11-points were generated for acceptability, adequacy, and relative goodness. These scales are provided in Appendix AK.

Balanced Terms

The scales generated using the Balanced Terms method use response alternatives with the same intensifier for opposite adverbs, e.g. extremely acceptable and extremely unacceptable. Similar to the Balanced Numeric Values technique, response alternatives with a $SD \geq 1.0$ and repeated terms were eliminated. In addition to these procedures, the Balanced Terms method required further eliminations. Response alternatives without a balanced term or with a balanced term with a $SD \geq 1.0$ were not considered. To ensure balanced terms had similar numeric values, terms were also eliminated when their absolute values differed by more than .50. These elimination procedures resulted in the response alternatives listed in Table 64 and Appendix AL.

Table 64. Acceptability response alternatives for working age personnel scale generation using the Balanced Terms method

Response Alternative	Mean	SD
Extremely acceptable	4.48	0.71
Extremely unacceptable	-4.80	0.42
Completely acceptable	4.41	0.84
Completely unacceptable	-4.84	0.48
Very very acceptable	4.22	0.82
Very very unacceptable	-4.51	0.64
Highly acceptable	4.03	0.64
Highly unacceptable	-4.29	0.63
Quite acceptable	3.12	0.84
Quite unacceptable	-3.50	0.82
Pretty acceptable	2.36	0.78
Pretty unacceptable	-2.75	0.83
Reasonably acceptable	2.26	0.82
Reasonably unacceptable	-2.51	0.79
Rather acceptable	2.26	0.87
Rather unacceptable	-2.44	0.87
Moderately acceptable	2.25	0.71
Moderately unacceptable	-2.41	0.77
Fairly acceptable	1.99	0.80
Fairly unacceptable	-2.31	0.80
Somewhat acceptable	1.48	0.69
Somewhat unacceptable	-1.78	0.76
Slightly acceptable	1.09	0.42
Slightly unacceptable	-1.20	0.51
Barely acceptable	1.04	0.52
Barely unacceptable	-1.21	0.66
Neutral	-0.02	0.21
Borderline	-0.13	0.58
Marginal	-0.21	0.93

The scale end points were selected by choosing the most positive response alternative and matching the negative term. The scale was incremented similar to the Balanced Numeric Values method based upon the number of scale points and the values of the end points. The positive response alternatives were selected with a mean rating as close as possible to the desired values. The negative balanced term was then matched to the positive term. Neutral was chosen as the midpoint because the mean rating was

closest to zero and the SD was very small. The seven-point acceptability scale including the desired values can be seen in Table 65 .

Table 65. Seven-point acceptability scale generated using the Balanced Terms method

Desired Value	Response Alternative	Mean	SD
4.48	Extremely acceptable	4.48	0.71
2.93	Quite acceptable	3.12	0.84
1.39	Somewhat acceptable	1.48	0.69
-0.16	Neutral	-0.02	0.21
-1.71	Somewhat unacceptable	-1.78	0.76
-3.25	Quite unacceptable	-3.50	0.82
-4.80	Extremely unacceptable	-4.80	0.42

Using the Balanced Terms method described in this section, scales of 5, 6, 7, 8, 9, and 11-points were generated for acceptability, adequacy, and relative goodness. These scales may be seen in Appendix AM.

Conclusions

With respect to the original objectives of this study, it can be concluded that:

1. The differences in response alternative mean ratings reported by Krsacok and Moroney (2002) *do not* exist when comparing US Army personnel (Matthews et al., 1978) with working age males. However, significant differences in response alternative mean ratings *do* exist when comparing mean ratings generated by college males with working age males *and* college females with working age females. Additionally, when sex was collapsed, significant differences in response alternative mean ratings still existed between the working age and college student samples. Therefore, subject factors associated with student and non-student status appear to be related to differences in quantitative ratings of adverb intensifiers.

2. The consistent lack of significant differences across sex found by Krsacok and Moroney (2002) *does* exist when comparing ratings generated by males and females of a working age population. Thus, sex does not appear to be a determining factor in assigning numeric values to response alternatives.
3. Differences in mean response alternative ratings *do not* exist for *any* different subgroups of the working age population segmented by occupation level, age, and education level. Since these subject factors, including sex (see #2 above), did not significantly influence the assignment of quantitative ratings to response alternatives by members of the working age sample, it is reasonable to assume that a common set of quantitative data could be used to develop scales for all members of a working age population.
4. The order of descriptors generated by a working age population *is* very consistent (correlations ~ 1.0) with the orders of descriptors generated by both college students (Krsacok and Moroney, 2002) and US Army personnel (Matthews et al., 1978). Thus, while the college students and working age groups differ on the quantitative value associated with particular response alternatives, the ordinal relation between response alternatives remains consistent. This suggests the existence of an underlying long term stability of adverb intensifier order across participant groups.
5. The tendency for college students (Krsacok and Moroney, 2002) or working age personnel to generate more extreme ratings (larger absolute values) *does not* exist, but the tendency for college students to generate more positive ratings (higher relative values) than working age personnel *does* exist. In other words,

working age personnel tend to quantitatively rate response alternatives more negatively than college students. Thus, subject factors or experiences associated with student/non-student status are related to the tendency to rate response alternatives higher or lower.

Additional Findings

Given these current findings, the results suggest ratings are relatively stable over time but the dissimilarities between college students and working age personnel produce different quantitative values for the response alternatives examined. These dissimilarities include age, work experience, generational differences, education level completed, and lifestyle differences.

Because working age personnel and college students (Krsacok, 2001) produced significantly different mean values on the acceptability, adequacy, and relative goodness lists, and working age subgroups produced similar mean values, new sets of response alternative scales were produced. These scales, as well as the quantitative data for each response alternative, should prove valuable to survey designers and researchers studying a working age population.

Additional Research

If we are to explain the differences between the ratings assigned by the student and non-student samples, further investigation into the specific factors that differentiate these populations are needed. Specifically, evaluating students and non-students of the same age group or studying older college students (e.g. over 25) may shed light on the contribution of age to the differences between ratings produced by college students and working age personnel in the current study.

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APPENDICES

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APPENDIX AD – ANOVA results for working age personnel segmented by age

APPENDIX AE – Significant pairwise comparisons for working age personnel segmented by age

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APPENDIX AG – ANOVA results for working age personnel segmented by education level

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APPENDIX AJ – Response alternatives for working age personnel scale generation

APPENDIX AK – Acceptability, adequacy, and relative goodness scales generated with the Balanced Numeric Values method

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using the Balanced Terms method

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the Balanced Terms method

APPENDIX A

Participant Letters

Pre-Invitation Letter:

This letter is written to be sent out by Tom Gannon (D500 Chief Engineer for Info Technology)

Hello,

Shortly you will be receiving an invitation to participate in a web-based survey being conducted by Don Means for completion of his Masters Thesis on "The Magnitude of Words". His study analyzes subjective opinions on the intensity of word combinations frequently used as questionnaire responses.

You will be asked to rate the degree of magnitude or intensity of the combination of words. The survey should take between 15-30 minutes. Results will help develop statistically valid survey scales which can be used by survey developers including MITRE personnel.

In addition to helping a colleague and increasing our knowledge about survey responses, upon completion of the survey, you will be entered in a random drawing for a **\$25, \$50, and \$100** Simon Mall Gift Card. Participation is completely voluntary and no project time will be available.

Please watch your email for the official invitation which you will receive shortly.

Thank You

Tom Gannon
Chief Engineer
D500 Information Technology Directorate

Invitation Letter:

Hello <dynamic name>,

You should have seen the email graciously sent by Tom Gannon regarding my Masters Thesis entitled "The Magnitude of Words". I am interested in your subjective opinion about the intensity of word combinations frequently used as questionnaire responses.

The survey should take between 15-30 minutes. You will be asked to rate the degree of magnitude or intensity of the combination of words. Results will help develop statistically valid survey scales which can be used by survey developers including MITRE personnel.

In addition to helping a colleague and increasing our knowledge about survey responses, upon completion of the survey, you will be entered in a random drawing for a \$25, \$50, and \$100 Simon Mall Gift Card. Participation is completely voluntary and no project time will be available. Please complete the survey by March 14, 2006 to be eligible for the drawing.

Please click <automatic link> to read the instructions and begin the survey.

Thank you for in advance for helping.

don

--

C. Don Means
Sr. Information Systems Engineer
The MITRE Corporation
781-271-8509
donmeans@mitre.org

Reminder Letter

Reminder letter sent 10 days after the invitation letter to persons who have not taken the survey.

Hello <dynamic name>,

Many MITRE colleagues have helped me out by completing the survey "The Magnitude of Words." If you have not yet completed the survey, you only have two days remaining. Completed surveys must be submitted by Wednesday March 15, 2006 to be eligible for the drawing of a **\$25, \$50, and \$100 Simon Mall Gift Card.**

MITRE colleagues have averaged only 19 minutes to complete the survey.

Please click <automatic link> to read the instructions and begin the survey.

Thank you for your time and assistance.

don

Error Letter

Letter sent to respondents with >15 sign errors (Sent to 47 participants, 8 responded again)

Hello

Thank you for taking the time to complete my survey, your help and time is greatly appreciated.

Unfortunately, the way I wrote the survey instructions proved to be confusing to many participants. The intention was for the phrases to be judged according to their connotative numeric value or intensity. For example: Extremely unsatisfactory is a strongly negative term, therefore it would be rated -4 or -5; Somewhat satisfactory represents a moderately positive term that may be rated from +1 to +3; Very satisfactory represents a highly positive term, thus it could be rated +4 or +5. The words were to be rated on their perceived meaning or numeric value.

In addition, because positive and negative phrases are listed together, several survey participants unintentionally labeled phrases with the opposite label e.g. very satisfactory labeled as -4. Therefore, attention must be paid to whether the phrases are positive or negative.

If you have the time, I would greatly appreciate if you could take the survey again, in light of this new information. If you chose to retake the survey, please complete it by Wednesday March 15, 2006. Please click <http://www.questionpro.com/akira/TakeSurvey?id=372042> to retake the survey (note: you may receive a message stating that a response was already received from your PC. If you receive this message, press the "Take the Survey Again" button to begin).

Regardless of whether or not you choose to retake the survey, you are entered in the drawing for the \$25, \$50, and \$100 Simon Mall Gift Cards.

Once again, thank you for your time.

don

--

C. Don Means
Sr. Information Systems Engineer
The MITRE Corporation
781-271-8509
donmeans@mitre.org

Reminder Letter:

Reminder letter will be sent 10 days after the invitation letter to persons who have not taken the survey.

Hello <dynamic name>,

Many MITRE colleagues have helped me out by completing the survey "The Magnitude of Words". If you have not yet completed the survey, remember you only have four days remaining until the drawing for a **\$25, \$50, and \$100 Simon Mall Gift Card**.

The survey should only take between 15-30 minutes.

Please click <automatic link> to read the instructions and begin the survey.

Thank you for your assistance.

don

--

C. Don Means
Sr. Information Systems Engineer
The MITRE Corporation
781-271-8509
donmeans@mitre.org

Thank You Letter

Thank you for your help with the Magnitude of Words study. I am impressed by the number of responses I received from AFC personnel. In two weeks, I received 465 complete responses!

You can check <SURVEY_LINK> to see the winners of the 3 gift cards. Winners will also be notified by email.

If you want to know more information about the study, see my transfer folder for a draft of my thesis and the proposal brief:

\\EmployeeShare\\d\\donmeans\\transfer_Thesis_For_More_Information. The final version will be available by Late Spring 06.

Feel free to contact me if you have additional questions.

Thanks again for your time and effort.

don

C. Don Means
Sr. Information Systems Engineer
The MITRE Corporation
781-271-8509
donmeans@mitre.org

Magnitude of Words Background

Survey designers often structure questionnaires so that respondents are asked to make judgments about "how much", "how often", etc. Respondents are usually asked to indicate these judgments on a continuum defined by a scale with an extreme negative anchor and an extreme positive anchor. The scale is incremented by "mirrored" terms that are intended to represent equal and opposite meanings. For example, you may be asked to give your response to the following question by circling a term on the scale below:

How adequate was the informed consent form in describing the conditions of this survey?

Extremely inadequate
Very inadequate
Slightly inadequate

Neither inadequate nor adequate
 Slightly adequate
 Very adequate
 Extremely adequate

Previous research has shown that the mirrored terms commonly used for these types of rating scales do not always form equal intervals and, therefore, have the potential to cause confounds in the analysis of the data derived from the questionnaire. More recently, Krsacok & Moroney (2002) studied a college age population, and using the same methodology as this experiment, created scales with equal numeric intervals.

The purpose of the current study is to:

- 1) Determine if the variability in descriptor ratings found by Krsacok (2002) persist when comparing Army personnel with working age males, as well as college males with working age males
- 2) Determine if the consistency across gender found by Krsacok (2002) persists when comparing males and females of a working age population
- 3) Determine if the order of descriptors generated by a working age population remain consistent with both college students and Army personnel
- 4) Create sets of equidistant adverb intensifiers for acceptability, adequacy, and relative goodness for use by survey developers analyzing a working age population

If you have any questions about the survey, you may contact any of the following people:

-Don Means (survey administrator) donmeans@mitre.org, 781-271-8509
 -Janet Perron (local MITRE independent POC) jperron@mitre.org, 781-271-5243
 -Dr. William Moroney (University of Dayton Faculty Sponsor)
 William.Moroney@notes.udayton.edu, 937-229-2767
 -Dr. Charles Kimble (Chair of the Research Review and Ethics Committee in the
 Psychology Department at the University of Dayton)
 Charles.Kimble@notes.udayton.edu, 937-229-2167

If you are interested in reading more about this topic, please consider consulting the following readings.

Bass, B. M., Cascio, W. F., & O'Connor, E. J. (1974). Magnitude estimations of expressions of frequency and amount. *Journal of Applied Psychology*, 59(3), 313-320.

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Schriesheim, C. A., & Castro, S. L. (1996). Referent effects in the magnitude estimation scaling of frequency expressions for response anchor sets: an empirical investigation. *Journal of Education and Psychological Measurement* 56(4), p. 557-569.

APPENDIX B

Informed Consent Form

Magnitude of Words - Current

Questions marked with a * are required

Informed Consent

This survey will require you to complete several word lists. You will be asked to rate the degree of magnitude or intensity of the word or combination of words. We are interested in your subjective opinion about the intensity of the word(s) so there are no right or wrong answers. You will use an eleven-point scale ranging from -5 to +5 to indicate your intensity estimations. The negative side of the scale will be used to rate word(s) with a negative connotation and the positive side for word(s) with positive connotations.

We expect the survey to take between 15-30 minutes. Your data will be kept confidential and assigned a subject number. All personally identifiable information e.g. email, IP address, etc., will only be used to track responses, and only researchers will be able to associate this information with the data. The data will be secured behind a password protected site and stored on a password protected computer, ensuring security. After the survey, your data will be combined with data from other subjects, thus your individual data will NOT be identifiable. This survey should not cause any stress or discomfort. You can discontinue this survey at any time without any negative consequences. As stated in the invitation email, upon completion of the survey, you will be entered in a random drawing for a \$25, \$50, and \$100 Simon Mall Gift Card.

If you have any questions about the survey, you may contact any of the following people:

-Don Means (survey administrator) donmeans@mitre.org, 781-271-8509

-Jahel Perron (local MITRE independent POC) jperron@mitre.org, 781-271-5243

-Dr. William Moroney (University of Dayton Faculty Sponsor) William.Moroney@notes.udayton.edu, 937-229-2767

-Dr. Charles Kimble (Chair of the Research Review and Ethics Committee in the Psychology Department at the University of Dayton) Charles.Kimble@notes.udayton.edu, 937-229-2167

If you have read and understand all of the above instructions, sign the form by entering your email address in the box below. As stated before, your identity will be kept confidential and separated from the results. *

Continue

Please contact donmeans@mitre.org if you have any questions.

APPENDIX C

Demographic Questions

Magnitude of Words - Current

Please complete the following

Indicate your gender

- ☐ Male
☐ Female

Please indicate your age as of today by entering your age in the text box OR selecting from the choices below

Enter your age:

Or select a range below:

- ☐ Under 18
☐ 18-22
☐ 23-27
☐ 28-32
☐ 33-37
☐ 38-42
☐ 43-47
☐ 48-52
☐ 53-57
☐ 58-62
☐ 63-67
☐ 68-72
☐ Over 72

Indicate your highest level of education completed

- ☐ High School
☐ Associate's
☐ Bachelor's
☐ Master's
☐ Ph.D.

If currently enrolled in a higher education program, please indicate the type of program

- ☐ Not currently enrolled
- ☐ Associate's
- ☐ Bachelor's
- ☐ Master's
- ☐ Ph.D.

Select your job category

- ☐ AC 1-AC 4
- ☐ AC 5-AC 7
- ☐ Pro 1-Pro 5
- ☐ SEC N
- ☐ EXE N
- ☐ COP N
- ☐ PSS

Continue

Please contact donmeans@mitre.org if you have any questions.

APPENDIX D

Instructions

Magnitude of Words - Current

READ THE INSTRUCTIONS BEFORE STARTING

The attached survey sets contain lists of word pairs used to describe items in terms of better or worse. You will be completing three lists of word pairs. The lists are labeled Acceptability, Adequacy, and Relative Goodness. Next to each word pair, there's a scale from -5 to +5. Using the radio buttons, use this scale to tell us how negative/unfavorable or positive/favorable each phrase would be for you if you used it to rate some equipment, procedure, or concept. A rating of -5 stands for the most negative or unfavorable rating possible, and +5 stands for the most positive or favorable rating possible, with less extreme degrees of unfavorableness or favorableness represented by the numbers in between. A rating of 0 means that the word pair is neither negative/unfavorable nor positive/favorable.

EXAMPLE:

For each word pair, choose the number which describes how negative/unfavorable or positive/favorable the rating word pair is when applied to you. For example, if you saw in a list the word pair "entirely satisfactory" and you considered it to be a very positive/favorable label, you would record your response by clicking the radio button corresponding to a +4 or +5. On the other hand, if you saw the word pair "entirely unsatisfactory" you might give it a -4 or -5 since it is a negative/unfavorable label. If you saw the phrase "neither satisfactory nor unsatisfactory", you might consider it to be a neutral label and give it a rating of 0 on the scale.

Note that the word pairs are to be rated on their meaning, not your personal approval or disapproval of the phrases as labels.

Review the entire list on each page before you start.

If you have any questions concerning these survey sets or the procedure, please contact Don Means at donmeans@mitre.org, 781-271-8509 or Janet Perron, jperron@mitre.org, 781-271-5243.

NOTE: PLEASE DO NOT USE THE BROWSER'S BACK BUTTON

Continue

Please contact donmeans@mitre.org if you have any questions.

APPENDIX E

Practice Questions

Magnitude of Words - Current

Questions marked with a * are required

Practice Survey *

Using the response options below, tell us how negative/unfavorable or positive/favorable each phrase would be for you if you used it to rate some equipment, procedure, or concept. A rating of -5 stands for the most negative or unfavorable rating possible, and +5 stands for the most positive or favorable rating possible, with less extreme degrees of unfavorableness or favorableness represented by the numbers in between. A rating of 0 means that the word pair is neither negative/unfavorable nor positive/favorable. *

Please complete the three items below:
Effectiveness

	-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Slightly Effective*	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Very Effective *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Completely Ineffective	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please complete the three items below:
Appropriateness

	-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Fairly Appropriate*	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Highly Inappropriate*	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Borderline Appropriate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Remember, the word pairs should be rated on their meaning, not your personal approval or disapproval of the phrases as labels. Press continue to begin the survey.

Continue

Please contact donmeans@mitre.org if you have any questions.

Magnitude of Words - Content

Rather acceptable *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fairly unacceptable *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Very very acceptable *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wholly unacceptable *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Acceptable *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Completely acceptable *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Extremely unacceptable *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

[Continue](#)Please contact donimeans@mitre.org if you have any questions.

Magnitude of Words - Current

[illegible]

Considerably adequate

Quite adequate + ○ ○ ○ ○ ○ ○ ○ ○ ○ ○

Mildly adequate

Extremely inadequate * ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○

Adequacy 3 of 4

	-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Fully adequate *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Slightly adequate *

Completely inadequate

[illegible]

Extremely adequate ☐ ☐ ☐ ☒ ☐ ☐ ☐ ☐ ☐ ☐

Pretty inadequate*

[illegible]

Exceptionally inadequate ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○

Most inadequate

[illegible]

Very inadequate *

Wholly inadequate ☐ ☐ ☐ ☒ ☐ ☐ ☐ ☐ ☐ ☐

Adequacy 4 of 4

[illegible]

Absolutely inadequate

Highly adequate.

Neutral*

Mildly inadequate

Decidedly adequate ☐ ☐ ☐ ☒ ☐ ☐ ☐ ☐ ☐ ☐

Magnitude of Words - Current

Fully inadequate *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Somewhat adequate *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Very very inadequate *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Exceptionally adequate *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Entirely adequate *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Considerably inadequate *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Barely inadequate *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

[Continue](#)

Please contact donnmeans@mitre.org if you have any questions.

Magnitude of Words - Current

Relative Goodness 3 of 4

	-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Worse *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Absolutely better *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Worst of all *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Extremely better *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Somewhat better *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Decidedly better *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Considerably worse *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Marginal *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The same *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Conspicuously worse *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Relative Goodness 4 of 4

	-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Barely worse *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Decidedly worst *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Moderately worse *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Undoubtedly worst *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Rather better *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Substantially worse *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Best of all *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Noticeably worse *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Slightly worse *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Absolutely best *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Very much worse *	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Continue

APPENDIX I

Magnitude of Words Debrief

Magnitude of Words

Thank you for your help with the "Magnitude of Words" study. Your response has been saved and recorded with ID 1234738

You can check <http://www.questionpro.com/akira/TakeSurvey?id=240063> in two weeks to learn the identity of the winners of the 3 gift cards are (winners will also be notified by email).

Contact me if you would like to learn the final results of this study. The results should be available by Spring 06.

If interested, I have attached a brief description of the rationale behind the study, and provided related references and links. Feel free to contact me if you have additional questions.

Magnitude of Words Background

Survey designers often structure questionnaires so that respondents are asked to make judgments about "how much", "how often", etc. Respondents are usually asked to indicate these judgments on a continuum defined by a scale with an extreme negative anchor and an extreme positive anchor. The scale is incremented by "mirrored" terms that are intended to represent equal and opposite meanings. For example, you may be asked to give your response to the following question by circling a term on the scale below:

How adequate was the informed consent form in describing the conditions of this survey?

Extremely inadequate
Very inadequate
Slightly inadequate
Neither inadequate nor adequate
Slightly adequate
Very adequate
Extremely adequate

Previous research has shown that the mirrored terms commonly used for these types of rating scales do not always form equal intervals and, therefore, have the potential to cause confounds in the analysis of the data derived from the questionnaire. More recently, Krsacok & Moroney (2002) studied a college age population, and using the same methodology as this experiment, created scales with equal numeric intervals.

The purpose of the current study is to:

- 1) Determine if the variability in descriptor ratings found by Krsacok (2002) persist when comparing Army personnel with working age males, as well as college males with working age males
- 2) Determine if the consistency across gender found by Krsacok (2002) persists when comparing males and females of a working age population
- 3) Determine if the order of descriptors generated by a working age population remain consistent with both college students and Army personnel
- 4) Create sets of equidistant adverb intensifiers for acceptability, adequacy, and relative goodness for use by survey developers analyzing a working age population

We ask you not to share any information about this experiment with your co-workers until the testing has been completed.

If you have any questions about the survey, you may contact any of the following people:

- Don Means (survey administrator) donmeans@mitre.org, 781-271-8509
- Janet Perron (local MITRE independent POC) jperron@mitre.org, 781-271-5243
- Dr. William Moroney (University of Dayton Faculty Sponsor) William.Moroney@notes.

Magnitude of Words

udayton.edu, 937-229-2767

-Dr. Charles Kimble (University of Dayton Ethics Committee Chair) Charles.Kimble@notes.
udayton.edu, 937-229-2167

If you are interested in reading more about this topic, please consider consulting the following readings.

Dillman, D. A. (2000). Mail and internet surveys: The tailored design method. New York: J. Wiley.

Krsacok, S.J. & Moroney, W.F. (n.d.). Adverb Intensifiers for use in Ratings of Acceptability, Adequacy, and Relative Goodness. Retrieved June 23, 2005 from FAA Human Factors Workbench Web site: <http://www.hf.faa.gov/Portal/ShowProduct.aspx?ProductID=167>

Krsacok, S.J. & Moroney, W.F. (2002). Adverb Intensifiers for use in Ratings of Acceptability, Adequacy, and Relative Goodness. Retrieved June 23, 2005 from University of Dayton, William F. Moroney's Web site: http://academic.udayton.edu/william_moroney/adverb_intensifiers_for_use_in_r.htm

Krsacok, S.J. & Moroney, W.F. (2002). Quantification of Adverb intensifiers for use in ratings of acceptability, adequacy, and relative goodness. Proceedings of the Human Factors and Ergonomics Society 46th Annual Meeting (pp 1944-1948). Santa Monica, CA: Human Factors and Ergonomics Society.

Thank You for completing this survey

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APPENDIX J

Working Age Female and Male Means and Standard Deviations

Table J-1. Working age female and male means and standard deviations arranged in descending order of adequacy

Descriptors	WA Males			WA Females		
	Mean	SD	N	Mean	SD	N
Extremely adequate	4.33	0.82	54	4.35	1.47	54
Totally adequate	4.28	0.94	54	4.48	0.69	54
Exceptionally adequate	4.26	0.89	54	4.57	0.60	54
Entirely adequate	4.11	0.96	54	4.28	1.28	54
Completely adequate	4.00	1.57	54	3.76	2.07	54
Fully adequate	3.98	0.96	54	4.15	0.83	54
Very very adequate	3.81	0.95	54	3.91	0.85	54
Absolutely adequate	3.72	2.02	54	4.35	1.03	54
Highly adequate	3.70	0.74	54	3.89	1.37	54
Most adequate	3.70	1.16	54	3.80	1.11	54
Wholly adequate	3.57	1.74	54	4.09	0.96	54
Perfectly adequate	3.37	1.88	54	3.74	1.18	54
Very adequate	3.19	0.78	54	3.37	1.42	54
Decidedly adequate	3.11	1.49	54	3.15	1.22	54
Substantially adequate	3.02	0.86	54	3.11	1.76	54
Considerably adequate	2.98	0.74	54	3.13	1.39	54
Quite adequate	2.85	0.98	54	2.96	0.99	54
Largely adequate	2.70	1.63	54	3.22	1.11	54
Reasonably adequate	2.31	0.95	54	2.48	0.72	54
Rather adequate	1.87	1.15	54	1.89	1.08	54
Pretty adequate	1.83	1.08	54	2.17	1.02	54
Somewhat adequate	1.61	0.68	54	1.57	0.96	54
Mildly adequate	1.44	0.74	54	1.35	0.73	54
Slightly adequate	1.02	0.63	54	0.93	0.91	54
Barely adequate	0.69	0.77	54	0.46	0.84	54
Neutral	0.00	0.00	54	0.00	0.00	54
Borderline	-0.11	0.57	54	-0.09	0.52	54
Barely inadequate	-1.04	0.27	54	-1.04	0.39	54
Slightly inadequate	-1.26	0.52	54	-1.30	0.57	54
Mildly inadequate	-1.57	0.79	54	-1.50	0.91	54
Somewhat inadequate	-1.57	0.86	54	-1.59	0.90	54
Fairly inadequate	-2.20	0.94	54	-2.35	0.99	54
Rather inadequate	-2.35	0.80	54	-2.59	0.66	54
Moderately inadequate	-2.54	0.64	54	-2.63	0.68	54
Pretty inadequate	-2.57	0.69	54	-2.57	1.16	54
Considerably inadequate	-3.41	0.74	54	-3.46	1.18	54
Very inadequate	-3.54	1.08	54	-3.87	0.80	54
Decidedly inadequate	-3.83	0.80	54	-3.43	1.06	54
Most inadequate	-3.98	1.22	54	-4.19	0.73	54
Highly inadequate	-4.09	0.56	54	-4.41	0.60	54
Very very inadequate	-4.26	1.33	54	-4.57	0.69	54
Fully inadequate	-4.41	1.07	54	-4.48	1.42	54
Exceptionally inadequate	-4.52	0.57	54	-4.80	0.45	54
Exceptionally inadequate	-4.54	0.64	54	-4.89	0.32	54
Wholly inadequate	-4.56	0.63	54	-4.59	0.69	54
Absolutely inadequate	-4.63	1.17	54	-4.98	0.14	54
Extremely inadequate	-4.65	0.52	54	-4.89	0.32	54
Entirely inadequate	-4.76	0.51	54	-4.83	0.38	54
Completely inadequate	-4.80	1.11	54	-4.89	0.32	54
Totally inadequate	-4.83	0.50	54	-4.85	0.41	54

Table J-2. Working age female and male means and standard deviations arranged in descending order of adequacy

Descriptors	WA Males			WA Females		
	Mean	SD	N	Mean	SD	N
Absolutely best	4.98	0.14	54	4.83	0.47	54
Best of all	4.96	0.19	54	4.78	0.63	54
Truly best	4.69	0.64	54	4.76	0.55	54
Best	4.57	0.74	54	4.19	1.23	54
Decidedly best	4.46	0.75	54	4.30	0.92	54
Undoubtedly best	4.33	1.57	54	4.61	0.96	54
Extremely better	4.04	0.78	54	4.30	0.69	54
Absolutely better	3.67	1.01	54	4.00	0.89	54
Substantially better	3.30	0.69	54	3.35	0.78	54
Decidedly better	3.13	0.73	54	3.15	0.68	54
Conspicuously better	2.44	1.08	54	2.70	1.13	54
Moderately better	2.06	0.66	54	2.24	0.64	54
Rather better	1.91	0.78	54	1.78	0.86	54
Somewhat better	1.65	0.68	54	1.63	0.62	54
Slightly better	1.11	0.32	54	1.24	0.51	54
Barely better	0.87	0.48	54	0.85	0.49	54
Absolutely alike	0.78	1.79	54	1.33	2.06	54
Alike	0.20	0.76	54	0.13	0.52	54
The same	0.00	0.00	54	0.00	0.00	54
Neutral	-0.04	0.19	54	0.02	0.14	54
Marginal	-0.17	0.69	54	-0.20	0.68	54
Borderline	-0.19	0.70	54	-0.07	0.38	54
Barely worse	-1.07	0.38	54	-1.11	0.42	54
Slightly worse	-1.28	0.60	54	-1.31	0.51	54
Somewhat worse	-1.63	0.65	54	-1.69	0.80	54
Moderately worse	-2.41	0.69	54	-2.70	0.60	54
Worse	-2.52	0.84	54	-2.52	1.18	54
Noticeably worse	-2.70	0.77	54	-2.85	0.96	54
Notably worse	-3.02	0.76	54	-3.04	0.87	54
Conspicuously worse	-3.19	0.80	54	-3.26	0.99	54
Much worse	-3.41	0.77	54	-3.41	0.71	54
Decidedly worse	-3.43	0.81	54	-3.39	0.92	54
Largely worse	-3.46	0.72	54	-3.52	0.69	54
Considerably worse	-3.52	0.61	54	-3.57	0.81	54
Substantially worse	-3.61	0.66	54	-3.96	0.70	54
Very much worse	-3.94	0.56	54	-3.91	0.76	54
Decidedly worst	-4.09	0.94	54	-3.78	1.34	54
Absolutely worse	-4.39	0.81	54	-4.56	0.72	54
Undoubtedly worst	-4.72	0.56	54	-4.57	0.74	54
Absolutely worst	-4.91	0.29	54	-4.91	0.45	54
Worst of all	-4.94	0.23	54	-4.94	0.23	54

APPENDIX K

Response distributions for multiple ratings of mildly acceptable and exceptionally inadequate

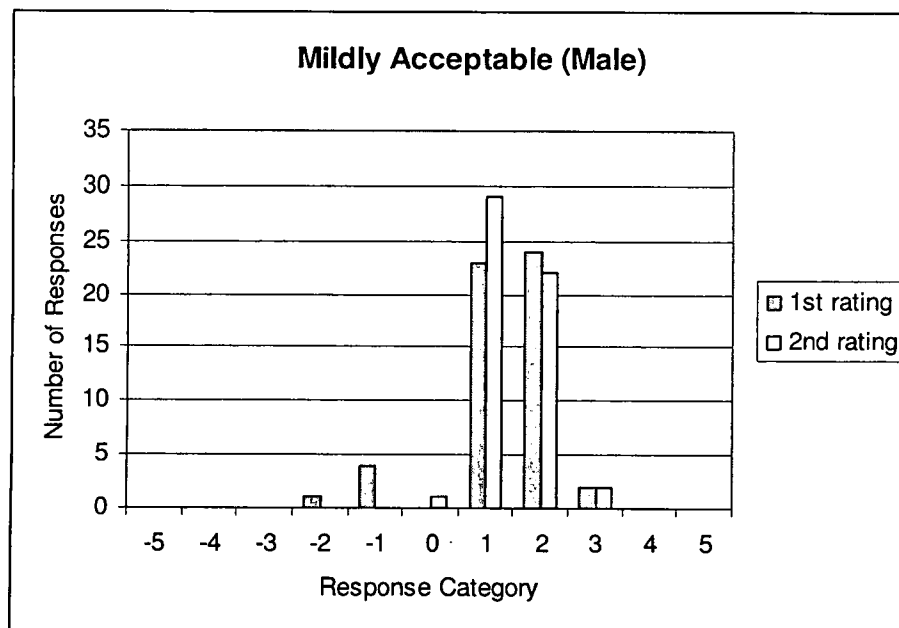


Figure K-1. Response distributions of working age males for "mildly acceptable"

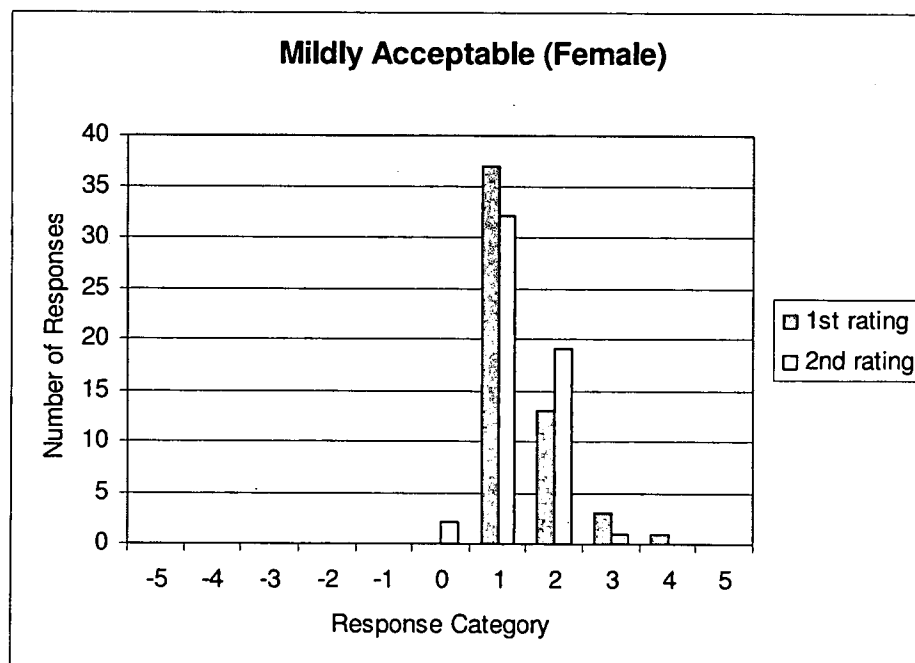


Figure K-2. Response distributions of working age females for "mildly acceptable"

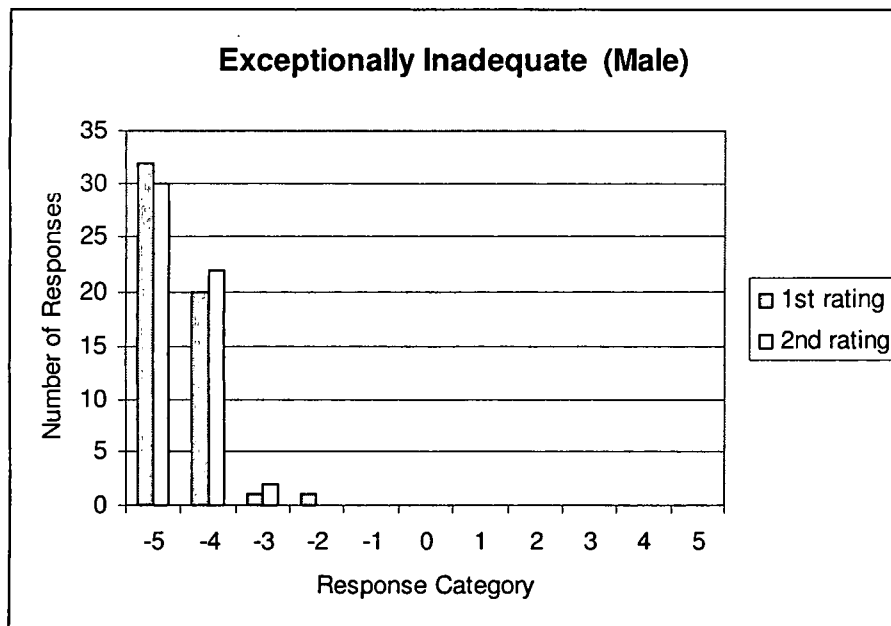


Figure K-3. Response distributions of working age males for "exceptionally inadequate"

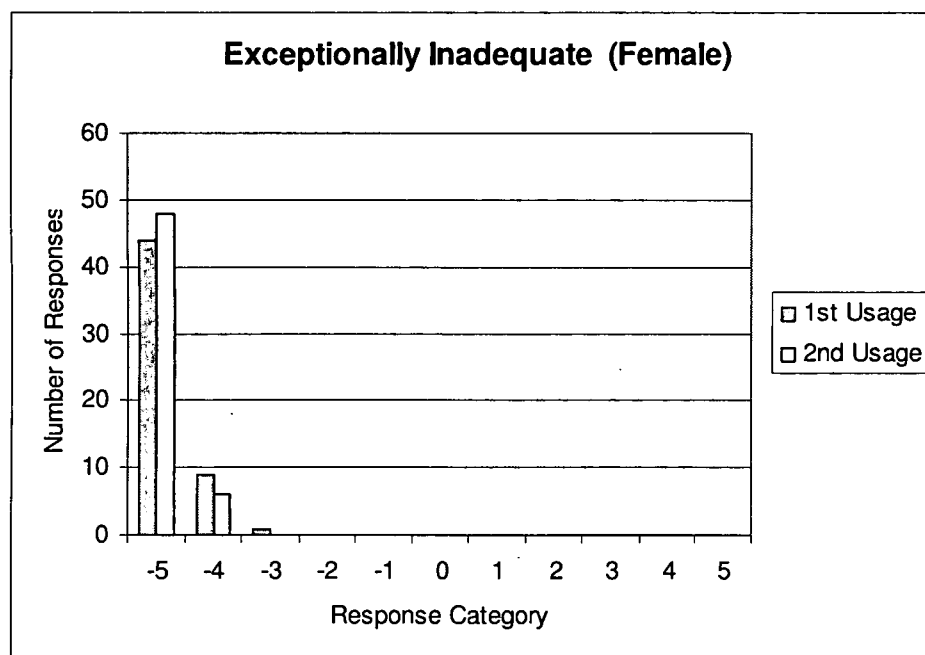


Figure K-4. Response distributions of working age females for "exceptionally inadequate"

APPENDIX L

T_{PROB} values for working age males and US Army personnel

Table L-1: Comparison of the adequacy response alternative values for working age males and US Army Personnel

Descriptors	WA Males			US Army Males			Diff*	t	t _{PROB}	Sig
	Mean	SD	N	Mean	SD	N				
Extremely adequate	4.33	0.82	54	4.41	0.72	51	0.08	0.53	0.597	
Totally adequate	4.28	0.94	54	4.62	0.85	50	0.34	1.93	0.056	
Exceptionally adequate	4.26	0.89	54	4.38	0.87	50	0.12	0.69	0.489	
Entirely adequate	4.11	0.96	54	4.34	0.86	50	0.23	1.28	0.202	
Completely adequate	4.00	1.57	54	4.49	0.83	51	0.49	2.01	0.047	X
Fully adequate	3.98	0.96	54	4.29	0.91	51	0.31	1.70	0.093	
Very very adequate	3.81	0.95	54	4.06	0.88	48	0.25	1.37	0.173	
Absolutely adequate	3.72	2.02	54	4.54	0.92	50	0.82	2.70	0.009	X
Most adequate	3.70	1.16	54	3.84	0.98	51	0.14	0.67	0.507	
Highly adequate	3.70	0.74	54	3.84	0.61	51	0.14	1.05	0.294	
Wholly adequate	3.57	1.74	54	4.31	1.04	51	0.74	2.66	0.009	X
Perfectly adequate	3.37	1.88	54	3.92	1.03	51	0.55	1.87	0.065	
Very adequate	3.19	0.78	54	3.42	0.85	50	0.23	1.44	0.153	
Decidedly adequate	3.11	1.49	54	3.14	1.54	50	0.03	0.10	0.920	
Substantially adequate	3.02	0.86	54	2.61	1.03	51	0.41	2.22	0.029	X
Considerably adequate	2.98	0.74	54	3.02	0.87	51	0.04	0.25	0.800	
Quite adequate	2.85	0.98	54	2.98	0.98	49	0.13	0.67	0.503	
Largely adequate	2.70	1.63	54	2.86	0.99	51	0.16	0.61	0.542	
Reasonably adequate	2.31	0.95	54	2.41	0.77	51	0.10	0.59	0.556	
Rather adequate	1.87	1.15	54	1.76	0.89	49	0.11	0.54	0.591	
Pretty adequate	1.83	1.08	54	2.31	0.86	49	0.48	2.48	0.015	X
Somewhat adequate	1.61	0.68	54	1.32	0.79	49	0.29	2.00	0.048	X
Mildly adequate	1.44	0.74	54	1.57	0.67	49	0.13	0.93	0.354	
Slightly adequate	1.02	0.63	54	1.20	0.57	50	0.18	1.52	0.131	
Barely adequate	0.69	0.77	54	0.63	0.93	51	0.06	0.36	0.719	
Neutral	0.00	0.00	54	0.00	0.00	50	0.00	0.00	1.000	
Borderline	-0.11	0.57	54	-0.02	0.32	50	0.09	1.00	0.319	
Barely inadequate	-1.04	0.27	54	-1.16	0.64	51	0.12	1.24	0.220	
Slightly inadequate	-1.26	0.52	54	-1.38	0.77	50	0.12	0.92	0.358	
Somewhat inadequate	-1.57	0.86	54	-1.88	0.73	51	0.31	1.99	0.050	X
Mildly inadequate	-1.57	0.79	54	-1.35	0.62	51	0.22	1.58	0.117	
Fairly inadequate	-2.20	0.94	54	-2.22	0.80	51	0.02	0.12	0.907	
Rather inadequate	-2.35	0.80	54	-2.35	0.96	49	0.00	0.00	1.000	
Moderately inadequate	-2.54	0.64	54	-3.60	0.68	45	1.06	7.98	0.000	X
Pretty inadequate	-2.57	0.69	54	-2.35	0.96	49	0.22	1.34	0.182	
Considerably inadequate	-3.41	0.74	54	-3.60	0.68	45	0.19	1.32	0.190	
Very inadequate	-3.54	1.08	54	-3.74	0.78	49	0.20	1.07	0.288	
Decidedly inadequate	-3.83	0.80	54	-3.78	0.94	50	0.05	0.29	0.770	
Most inadequate	-3.98	1.22	54	-3.98	1.55	49	0.00	0.00	1.000	
Highly inadequate	-4.09	0.56	54	-4.20	0.74	51	0.11	0.86	0.391	
Very very inadequate	-4.26	1.33	54	-4.46	0.54	50	0.20	1.02	0.312	
Fully inadequate	-4.41	1.07	54	-4.67	0.68	51	0.26	1.49	0.139	
Exceptionally inadequate	-4.52	0.57	54	-4.56	0.64	50	0.04	0.34	0.737	
Exceptionally inadequate	-4.54	0.64	54	-4.68	0.51	50	0.14	1.23	0.223	
Wholly inadequate	-4.56	0.63	54	-4.78	0.50	51	0.22	1.97	0.051	
Absolutely inadequate	-4.63	1.17	54	-4.88	0.43	50	0.25	1.47	0.147	
Extremely inadequate	-4.65	0.52	54	-4.60	0.53	51	0.05	0.49	0.627	
Entirely inadequate	-4.76	0.51	54	-4.79	0.64	48	0.03	0.26	0.793	
Completely inadequate	-4.80	1.11	54	-4.80	0.53	50	0.00	0.00	1.000	
Totally inadequate	-4.83	0.50	54	-4.90	0.41	50	0.07	0.78	0.439	

*Absolute value of the difference. X: significant <0.05

Table L-2. Comparison of the relative goodness response alternative values for working age males and US Army Personnel

Descriptors	WA Males			US Army Males			Diff*	t	t _{PROB}	Sig
	Mean	SD	N	Mean	SD	N				
Absolutely best	4.98	0.14	54	4.84	0.46	51	0.14	2.08	0.042	X
Best of all	4.96	0.19	54	4.90	0.51	48	0.06	0.77	0.445	
Truly best	4.69	0.64	54	4.60	0.72	50	0.09	0.67	0.501	
Best	4.57	0.74	54	4.22	1.46	51	0.35	1.54	0.129	
Decidedly best	4.46	0.75	54	4.37	0.84	51	0.09	0.58	0.563	
Undoubtedly best	4.33	1.57	54	4.57	0.82	51	0.24	0.99	0.325	
Extremely better	4.04	0.78	54	3.92	0.88	51	0.12	0.74	0.461	
Absolutely better	3.67	1.01	54	4.06	0.99	50	0.39	1.99	0.050	X
Substantially better	3.30	0.69	54	3.70	0.92	50	0.40	2.52	0.013	X
Decidedly better	3.13	0.73	54	3.41	0.93	51	0.28	1.72	0.088	
Conspicuously better	2.44	1.08	54	3.06	0.80	51	0.62	3.33	0.001	X
Moderately better	2.06	0.66	54	2.26	0.74	51	0.20	1.46	0.146	
Rather better	1.91	0.78	54	1.82	0.72	49	0.09	0.61	0.546	
Somewhat better	1.65	0.68	54	1.84	0.80	51	0.19	1.31	0.192	
Slightly better	1.11	0.32	54	1.16	0.78	51	0.05	0.43	0.672	
Barely better	0.87	0.48	54	0.96	0.66	51	0.09	0.80	0.424	
Absolutely alike	0.78	1.79	54	0.59	1.62	51	0.19	0.57	0.570	
Alike	0.20	0.76	54	0.22	0.85	51	0.02	0.13	0.899	
The same	0.00	0.00	54	0.16	0.80	51	0.16	1.47	0.145	
Neutral	-0.04	0.19	54	0.00	0.00	50	0.04	1.49	0.140	
Marginal	-0.17	0.69	54	-0.18	0.92	49	0.01	0.06	0.950	
Borderline	-0.19	0.70	54	-0.06	0.31	49	0.13	1.24	0.220	
Barely worse	-1.07	0.38	54	-1.04	0.82	51	0.03	0.24	0.812	
Slightly worse	-1.28	0.60	54	-1.22	0.50	51	0.06	0.55	0.580	
Somewhat worse	-1.63	0.65	54	-2.08	0.86	51	0.45	3.04	0.003	X
Moderately worse	-2.41	0.69	54	-2.22	0.94	50	0.19	1.18	0.240	
Worse	-2.52	0.84	54	-2.67	1.42	51	0.15	0.65	0.515	
Noticeably worse	-2.70	0.77	54	-2.53	1.04	51	0.17	0.96	0.342	
Notably worse	-3.02	0.76	54	-3.02	1.04	51	0.00	0.00	1.000	
Conspicuously worse	-3.19	0.80	54	-3.28	1.21	51	0.09	0.45	0.656	
Much worse	-3.41	0.77	54	-3.29	0.81	49	0.12	0.77	0.443	
Decidedly worse	-3.43	0.81	54	-3.76	0.91	50	0.33	1.96	0.053	
Largely worse	-3.46	0.72	54	-3.22	1.10	51	0.24	1.31	0.192	
Considerably worse	-3.52	0.61	54	-3.28	1.21	51	0.24	1.27	0.207	
Substantially worse	-3.61	0.66	54	-3.46	0.90	50	0.15	0.97	0.332	
Very much worse	-3.94	0.56	54	-3.94	0.91	50	0.00	0.00	1.000	
Decidedly worst	-4.09	0.94	54	-4.43	0.75	51	0.34	2.04	0.044	X
Absolutely worse	-4.39	0.81	54	-4.69	1.29	51	0.30	1.42	0.160	
Undoubtedly worst	-4.72	0.56	54	-4.51	0.87	51	0.21	1.46	0.148	
Absolutely worst	-4.91	0.29	54	-4.69	1.29	51	0.22	1.19	0.239	
Worst of all	-4.94	0.23	54	-4.78	1.30	49	0.16	0.85	0.400	

*Absolute value of the difference. X: significant <.05

F_{MAX} values for working age males and Army personnelTable M-1. F_{MAX} values for working age males and Army personnel for acceptability

Descriptor	SD		F_{MAX}	$F_{CRIT} (2.07)$
	WA Males	Army Males		
Completely acceptable	1.48	0.61	5.90	X
Fully acceptable	0.90	0.87	1.07	
Very very acceptable	1.45	0.83	3.04	X
Wholly acceptable	0.99	0.56	3.13	X
Highly acceptable	1.14	0.63	3.27	X
Most acceptable	1.34	0.92	2.14	X
Extremely acceptable	2.73	0.72	14.37	X
Quite acceptable	1.29	0.96	1.80	
Acceptable	1.25	1.46	1.37	
Largely acceptable	1.90	0.99	3.69	X
Pretty acceptable	0.66	1.13	2.96	X
Reasonably acceptable	0.73	0.72	1.01	
Rather acceptable	1.19	0.82	2.11	X
Moderately acceptable	1.16	0.72	2.62	X
Fairly acceptable	0.68	0.92	1.81	
Mildly acceptable	0.61	0.95	2.46	X
Somewhat acceptable	0.73	1.24	2.91	X
Mildly acceptable	0.99	0.70	1.99	
Sort of acceptable	0.59	0.65	1.21	
Slightly acceptable	0.57	0.52	1.18	
Barely acceptable	0.59	0.52	1.31	
Neutral	0.19	0.00	0.00	
Borderline	0.70	0.20	12.31	X
Marginal	0.97	0.52	3.46	X
Barely unacceptable	0.49	0.30	2.72	X
Slightly unacceptable	0.39	0.59	2.26	X
Somewhat unacceptable	0.91	0.67	1.83	
Fairly unacceptable	0.66	0.88	1.76	
Rather unacceptable	0.86	0.84	1.04	
Moderately unacceptable	0.69	0.68	1.03	
Reasonably unacceptable	0.93	0.75	1.53	
Pretty unacceptable	1.11	0.66	2.83	X
Notably unacceptable	0.93	1.04	1.25	
Quite unacceptable	1.09	1.07	1.04	
Unacceptable	1.13	1.38	1.50	
Substantially unacceptable	0.72	0.90	1.58	
Largely unacceptable	0.63	0.82	1.68	
Considerably unacceptable	0.77	0.78	1.04	
Decidedly unacceptable	1.37	1.02	1.80	
Highly unacceptable	0.52	0.58	1.23	
Highly unacceptable	0.54	0.54	1.00	
Most unacceptable	0.82	0.72	1.31	
Wholly unacceptable	1.44	0.27	28.26	X
Very very unacceptable	0.57	0.50	1.32	
Exceptionally unacceptable	0.60	0.61	1.04	
Completely unacceptable	0.60	0.36	2.74	X
Extremely unacceptable	0.48	0.46	1.10	
Totally unacceptable	0.35	0.24	2.14	X
Absolutely unacceptable	0.29	0.33	1.27	
Entirely unacceptable	0.29	0.36	1.51	

Table M-2. F_{MAX} values for working age males and Army personnel for adequacy

Descriptor	SD		F_{MAX}	$F_{CRIT} (2.07)$
	WA Males	Army M		
Extremely adequate	0.82	0.72	1.31	
Totally adequate	0.94	0.85	1.22	
Exceptionally adequate	0.89	0.87	1.06	
Entirely adequate	0.96	0.86	1.26	
Completely adequate	1.57	0.83	3.56	X
Fully adequate	0.96	0.91	1.12	
Very very adequate	0.95	0.88	1.17	
Absolutely adequate	2.02	0.92	4.83	X
Most adequate	1.16	0.98	1.40	
Highly adequate	0.74	0.61	1.48	
Wholly adequate	1.74	1.04	2.81	X
Perfectly adequate	1.88	1.03	3.32	X
Very adequate	0.78	0.85	1.19	
Decidedly adequate	1.49	1.54	1.07	
Substantially adequate	0.86	1.03	1.44	
Considerably adequate	0.74	0.87	1.38	
Quite adequate	0.98	0.98	1.00	
Largely adequate	1.63	0.99	2.72	X
Reasonably adequate	0.95	0.77	1.52	
Rather adequate	1.15	0.89	1.67	
Pretty adequate	1.08	0.86	1.57	
Somewhat adequate	0.68	0.79	1.33	
Mildly adequate	0.74	0.67	1.23	
Slightly adequate	0.63	0.57	1.22	
Barely adequate	0.77	0.93	1.45	
Neutral	0.00	0.00	0.00	
Borderline	0.57	0.32	3.19	X
Barely inadequate	0.27	0.64	5.53	X
Slightly inadequate	0.52	0.77	2.19	X
Somewhat inadequate	0.86	0.73	1.39	
Mildly inadequate	0.79	0.62	1.63	
Fairly inadequate	0.94	0.80	1.38	
Rather inadequate	0.80	0.96	1.42	
Moderately inadequate	0.64	0.68	1.14	
Pretty inadequate	0.69	0.96	1.94	
Considerably inadequate	0.74	0.68	1.18	
Very inadequate	1.08	0.78	1.90	
Decidedly inadequate	0.80	0.94	1.40	
Most inadequate	1.22	1.55	1.61	
Highly inadequate	0.56	0.74	1.76	
Very very inadequate	1.33	0.54	6.11	X
Fully inadequate	1.07	0.68	2.49	X
Exceptionally inadequate	0.57	0.64	1.24	
Exceptionally inadequate	0.64	0.51	1.55	
Wholly inadequate	0.63	0.50	1.61	
Absolutely inadequate	1.17	0.43	7.41	X
Extremely inadequate	0.52	0.53	1.04	
Entirely inadequate	0.51	0.64	1.57	
Completely inadequate	1.11	0.53	4.35	X
Totally inadequate	0.50	0.41	1.52	

Table M-3. F_{MAX} values for working age males and Army personnel for relative goodness

Descriptor	SD		F_{MAX}	$F_{CRIT} (2.07)$
	WA Males	Army M		
Absolutely best	0.14	0.46	11.43	X
Best of all	0.19	0.51	7.16	X
Truly best	0.64	0.72	1.27	
Best	0.74	1.46	3.87	X
Decidedly best	0.75	0.84	1.27	
Undoubtedly best	1.57	0.82	3.65	X
Extremely better	0.78	0.88	1.29	
Absolutely better	1.01	0.99	1.04	
Substantially better	0.69	0.92	1.78	
Decidedly better	0.73	0.93	1.63	
Conspicuously better	1.08	0.80	1.81	
Moderately better	0.66	0.74	1.27	
Rather better	0.78	0.72	1.18	
Somewhat better	0.68	0.80	1.40	
Slightly better	0.32	0.78	6.05	X
Barely better	0.48	0.66	1.91	
Absolutely alike	1.79	1.62	1.22	
Alike	0.76	0.85	1.24	
The same	0.00	0.80	0.00	
Neutral	0.19	0.00	--	
Marginal	0.69	0.92	1.76	
Borderline	0.70	0.31	5.13	X
Barely worse	0.38	0.82	4.63	X
Slightly worse	0.60	0.50	1.42	
Somewhat worse	0.65	0.86	1.74	
Moderately worse	0.69	0.94	1.87	
Worse	0.84	1.42	2.85	X
Noticeably worse	0.77	1.04	1.83	
Notably worse	0.76	1.04	1.85	
Conspicuously worse	0.80	1.21	2.27	X
Much worse	0.77	0.81	1.12	
Decidedly worse	0.81	0.91	1.25	
Largely worse	0.72	1.10	2.34	X
Considerably worse	0.61	1.21	3.98	X
Substantially worse	0.66	0.90	1.88	
Very much worse	0.56	0.91	2.61	X
Decidedly worst	0.94	0.75	1.56	
Absolutely worse	0.81	1.29	2.53	X
Undoubtedly worst	0.56	0.87	2.38	X
Absolutely worst	0.29	1.29	19.44	X
Worst of all	0.23	1.30	31.61	X

APPENDIX N

Bivariate distributions of mean values for working age males and US Army personnel

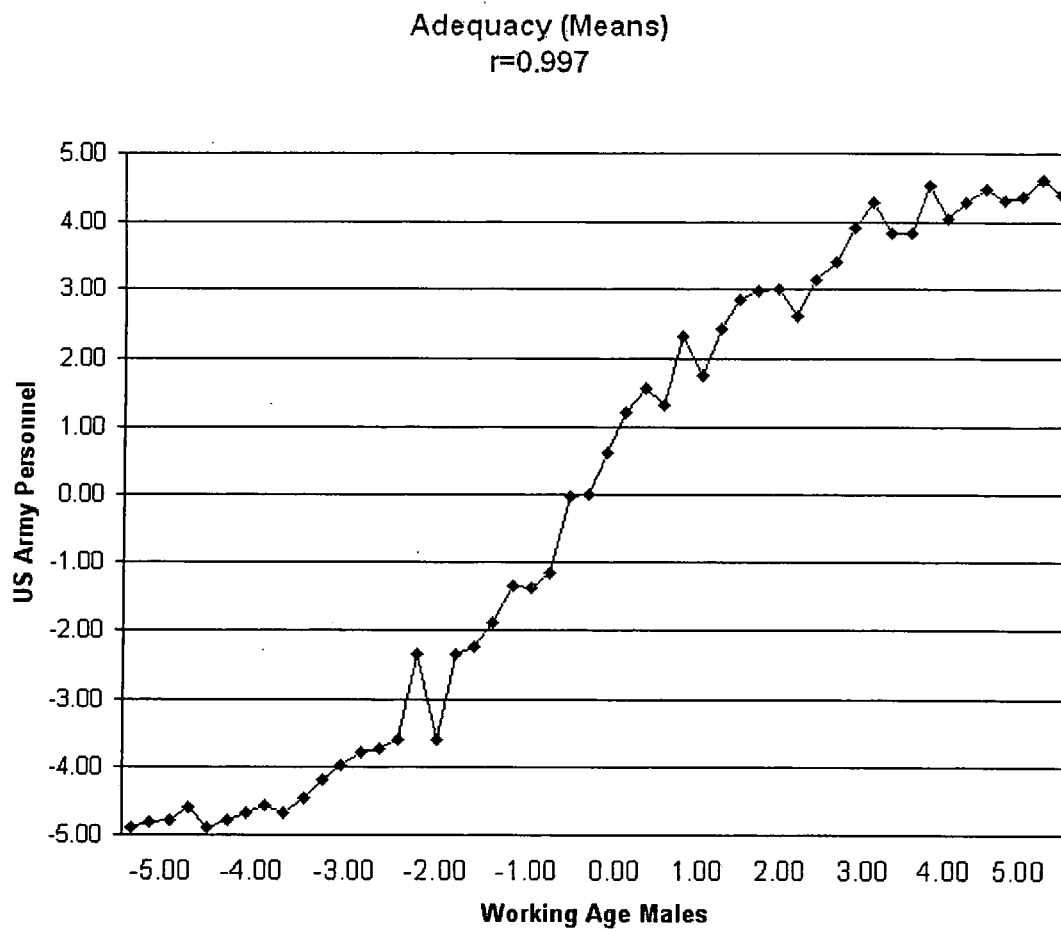


Figure N-1. Bivariate distribution of mean values for adequacy response alternatives for working age males and US Army personnel

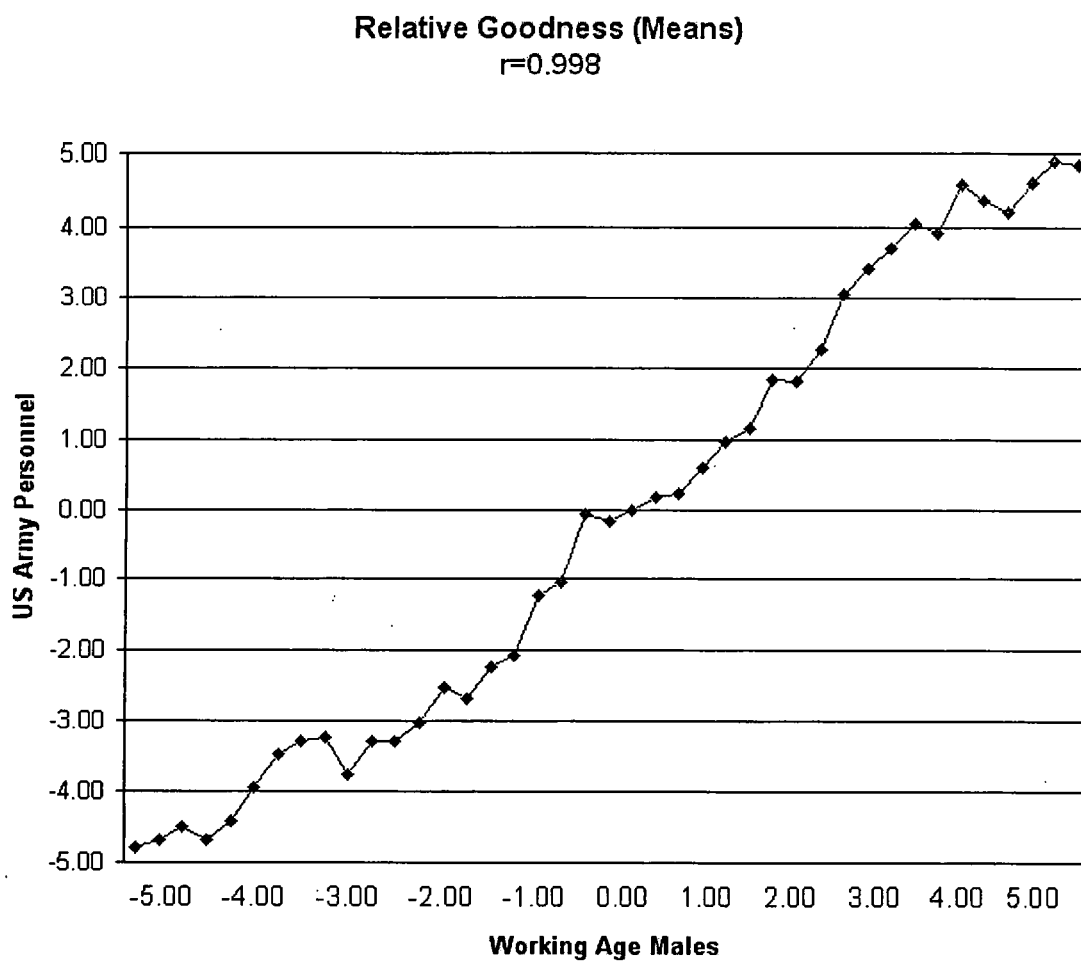


Figure N-2. Bivariate distribution of mean values for relative goodness response alternatives for working age males and US Army personnel

APPENDIX O

T_{PROB} values for working age males and college males

Table O-1. Comparison of the adequacy response alternative values for working age males and college males

Descriptors	WA Males			College Males			Diff*	t	t _{PROB}	Sig
	Mean	SD	N	Mean	SD	N				
Extremely adequate	4.33	0.82	54	4.69	0.47	54	0.36	2.80	0.006	X
Totally adequate	4.28	0.94	54	4.5	0.75	54	0.22	1.34	0.182	
Exceptionally adequate	4.26	0.89	54	4.35	0.73	54	0.09	0.57	0.567	
Entirely adequate	4.11	0.96	54	4.48	0.77	54	0.37	2.21	0.029	X
Completely adequate	4.00	1.57	54	4.33	0.87	54	0.33	1.35	0.180	
Fully adequate	3.98	0.96	54	4.35	0.76	54	0.37	2.22	0.029	X
Very very adequate	3.81	0.95	54	4.39	0.71	54	0.58	3.59	0.001	X
Absolutely adequate	3.72	2.02	54	4.62	0.69	53	0.90	3.10	0.003	X
Most adequate	3.70	1.16	54	3.96	1.10	54	0.26	1.20	0.235	
Highly adequate	3.70	0.74	54	4.07	0.54	54	0.37	2.97	0.004	X
Wholly adequate	3.57	1.74	54	4.07	1.04	54	0.50	1.81	0.073	
Perfectly adequate	3.37	1.88	54	4.37	0.91	52	1.00	3.51	0.001	X
Very adequate	3.19	0.78	54	3.61	0.74	54	0.42	2.87	0.005	X
Decidedly adequate	3.11	1.49	54	2.57	1.17	53	0.54	2.08	0.040	X
Substantially adequate	3.02	0.86	54	3.31	0.88	52	0.29	1.72	0.089	
Considerably adequate	2.98	0.74	54	2.83	0.72	54	0.15	1.07	0.288	
Quite adequate	2.85	0.98	54	2.96	0.71	53	0.11	0.66	0.508	
Largely adequate	2.70	1.63	54	3.57	0.60	53	0.87	3.68	0.000	X
Reasonably adequate	2.31	0.95	54	2.25	0.70	53	0.06	0.37	0.711	
Rather adequate	1.87	1.15	54	2.35	0.76	54	0.48	2.56	0.012	X
Pretty adequate	1.83	1.08	54	2.11	0.75	53	0.28	1.55	0.123	
Somewhat adequate	1.61	0.68	54	1.65	0.73	54	0.04	0.29	0.769	
Mildly adequate	1.44	0.74	54	1.57	0.72	53	0.13	0.92	0.359	
Slightly adequate	1.02	0.63	54	1.13	0.39	53	0.11	1.09	0.280	
Barely adequate	0.69	0.77	54	1.00	0.28	51	0.31	2.77	0.007	X
Neutral	0.00	0.00	54	-0.02	0.14	54	0.02	1.05	0.297	
Borderline	-0.11	0.57	54	-0.15	0.36	54	0.04	0.44	0.664	
Barely inadequate	-1.04	0.27	54	-1.04	0.27	54	0.00	0.00	1.000	
Slightly inadequate	-1.26	0.52	54	-1.28	0.45	54	0.02	0.21	0.831	
Somewhat inadequate	-1.57	0.86	54	-1.83	0.72	54	0.26	1.70	0.091	
Mildly inadequate	-1.57	0.79	54	-1.74	0.68	53	0.17	1.19	0.236	
Fairly inadequate	-2.20	0.94	54	-2.06	0.79	53	0.14	0.83	0.407	
Rather inadequate	-2.35	0.80	54	-2.46	0.83	52	0.11	0.69	0.489	
Moderately inadequate	-2.54	0.64	54	-2.50	0.67	54	0.04	0.32	0.752	
Pretty inadequate	-2.57	0.69	54	-2.50	0.84	54	0.07	0.47	0.637	
Considerably inadequate	-3.41	0.74	54	-3.28	0.74	53	0.13	0.91	0.366	
Very inadequate	-3.54	1.08	54	-3.69	1.06	54	0.15	0.73	0.468	
Decidedly inadequate	-3.83	0.80	54	-2.94	1.12	54	0.89	4.75	0.000	X
Most inadequate	-3.98	1.22	54	-3.89	0.82	53	0.09	0.45	0.655	
Highly inadequate	-4.09	0.56	54	-4.04	1.37	52	0.05	0.24	0.808	
Very very inadequate	-4.26	1.33	54	-4.61	0.56	54	0.35	1.78	0.079	
Fully inadequate	-4.41	1.07	54	-4.59	0.63	54	0.18	1.07	0.290	
Exceptionally inadequate	-4.52	0.57	54	-4.39	0.71	54	0.13	1.05	0.296	
Exceptionally inadequate	-4.54	0.64	54	-4.52	0.61	54	0.02	0.17	0.868	
Wholly inadequate	-4.56	0.63	54	-4.39	0.76	54	0.17	1.27	0.208	
Absolutely inadequate	-4.63	1.17	54	-4.81	0.44	53	0.18	1.06	0.294	
Extremely inadequate	-4.65	0.52	54	-4.63	0.59	54	0.02	0.19	0.852	
Entirely inadequate	-4.76	0.51	54	-4.81	0.44	54	0.05	0.55	0.587	
Completely inadequate	-4.80	1.11	54	-4.72	0.49	54	0.08	0.48	0.629	
Totally inadequate	-4.83	0.50	54	-4.85	0.41	54	0.02	0.23	0.821	

*Absolute value of the difference. X: significant <.05

Table O-2. Comparison of the relative goodness response alternative values for working age males and college males

Descriptors	WA Males			College Males			Diff*	t	t _{PROB}	Sig
	Mean	SD	N	Mean	SD	N				
Absolutely best	4.98	0.14	54	4.81	0.44	54	0.17	2.71	0.009	X
Best of all	4.96	0.19	54	4.54	0.61	54	0.42	4.83	0.000	X
Truly best	4.69	0.64	54	4.31	0.82	54	0.38	2.68	0.008	X
Best	4.57	0.74	54	3.61	1.04	54	0.96	5.53	0.000	X
Decidedly best	4.46	0.75	54	3.48	1.16	54	0.98	5.21	0.000	X
Undoubtedly best	4.33	1.57	54	4.75	0.52	53	0.42	1.86	0.067	
Extremely better	4.04	0.78	54	3.81	0.75	54	0.23	1.56	0.121	
Absolutely better	3.67	1.01	54	3.93	0.72	54	0.26	1.54	0.126	
Substantially better	3.30	0.69	54	3.09	0.76	54	0.21	1.50	0.136	
Decidedly better	3.13	0.73	54	2.61	0.88	54	0.52	3.34	0.001	X
Conspicuously better	2.44	1.08	54	2.40	1.00	52	0.04	0.20	0.844	
Moderately better	2.06	0.66	54	1.91	0.71	53	0.15	1.13	0.260	
Rather better	1.91	0.78	54	2.17	0.84	54	0.26	1.67	0.099	
Somewhat better	1.65	0.68	54	1.52	0.61	54	0.13	1.05	0.298	
Slightly better	1.11	0.32	54	1.44	0.63	54	0.33	3.43	0.001	X
Barely better	0.87	0.48	54	1.09	0.49	54	0.22	2.36	0.020	X
Absolutely alike	0.78	1.79	54	2.46	2.01	54	1.68	4.59	0.000	X
Alike	0.20	0.76	54	0.93	1.08	54	0.73	4.06	0.000	X
The same	0.00	0.00	54	0.02	0.14	54	0.02	1.05	0.297	
Neutral	-0.04	0.19	54	0.00	0.68	53	0.04	0.41	0.681	
Marginal	-0.17	0.69	54	0.00	0.68	53	0.17	1.28	0.202	
Borderline	-0.19	0.70	54	-0.06	0.30	54	0.13	1.25	0.214	
Barely worse	-1.07	0.38	54	-1.13	0.39	54	0.06	0.81	0.420	
Slightly worse	-1.28	0.60	54	-1.15	0.36	54	0.13	1.37	0.176	
Somewhat worse	-1.63	0.65	54	-1.70	0.66	54	0.07	0.56	0.580	
Moderately worse	-2.41	0.69	54	-2.57	0.84	54	0.16	1.08	0.282	
Worse	-2.52	0.84	54	-2.26	0.94	54	0.26	1.52	0.133	
Noticeably worse	-2.70	0.77	54	-2.78	0.82	54	0.08	0.52	0.602	
Notably worse	-3.02	0.76	54	-2.57	0.94	54	0.45	2.74	0.007	X
Conspicuously worse	-3.19	0.80	54	-2.76	1.04	54	0.43	2.41	0.018	X
Much worse	-3.41	0.77	54	-3.54	0.69	54	0.13	0.92	0.358	
Decidedly worse	-3.43	0.81	54	-3.19	1.18	54	0.24	1.23	0.221	
Largely worse	-3.46	0.72	54	-3.52	0.54	54	0.06	0.49	0.625	
Considerably worse	-3.52	0.61	54	-3.39	0.71	54	0.13	1.02	0.310	
Substantially worse	-3.61	0.66	54	-3.68	0.67	53	0.07	0.54	0.587	
Very much worse	-3.94	0.56	54	-4.04	0.61	54	0.10	0.89	0.377	
Decidedly worst	-4.09	0.94	54	-3.46	1.18	54	0.63	3.07	0.003	X
Absolutely worse	-4.39	0.81	54	-4.52	0.67	54	0.13	0.91	0.366	
Undoubtedly worst	-4.72	0.56	54	-4.17	0.95	54	0.55	3.67	0.000	X
Absolutely worst	-4.91	0.29	54	-4.76	0.51	54	0.15	1.88	0.064	
Worst of all	-4.94	0.23	54	-4.70	0.60	54	0.24	2.74	0.008	X

*Absolute value of the difference. X: significant <.05

APPENDIX P

 F_{MAX} values for working age males and college malesTable P-1. F_{MAX} values for working age males and college males for acceptability

Descriptor	SD		F_{MAX}	$F_{CRIT} (2.07)$
	WA Males	College Males		
Completely acceptable	1.48	0.74	4.01	X
Fully acceptable	0.90	0.72	1.56	
Very very acceptable	1.45	0.84	2.96	X
Wholly acceptable	0.99	0.78	1.61	
Highly acceptable	1.14	0.49	5.41	X
Most acceptable	1.34	0.82	2.69	X
Extremely acceptable	2.73	0.54	25.55	X
Quite acceptable	1.29	0.95	1.84	
Acceptable	1.25	1.07	1.36	
Largely acceptable	1.90	0.72	6.97	X
Pretty acceptable	0.66	0.73	1.24	
Reasonably acceptable	0.73	0.72	1.01	
Rather acceptable	1.19	0.74	2.60	X
Moderately acceptable	1.16	0.68	2.93	X
Fairly acceptable	0.68	0.75	1.20	
Mildly acceptable	0.61	0.75	1.53	
Somewhat acceptable	0.73	0.57	1.63	
Mildly acceptable	0.99	0.69	2.05	
Sort of acceptable	0.59	0.63	1.13	
Slightly acceptable	0.57	0.51	1.23	
Barely acceptable	0.59	1.09	3.36	X
Neutral	0.19	0.00	0.00	
Borderline	0.70	0.41	2.93	X
Marginal	0.97	0.45	4.63	X
Barely unacceptable	0.49	0.24	4.25	X
Slightly unacceptable	0.39	0.63	2.58	X
Somewhat unacceptable	0.91	0.71	1.63	
Fairly unacceptable	0.66	0.73	1.21	
Rather unacceptable	0.86	0.79	1.17	
Moderately unacceptable	0.69	0.64	1.17	
Reasonably unacceptable	0.93	0.76	1.49	
Pretty unacceptable	1.11	0.78	2.03	
Notably unacceptable	0.93	0.94	1.02	
Quite unacceptable	1.09	0.74	2.18	X
Unacceptable	1.13	1.16	1.06	
Substantially unacceptable	0.72	0.95	1.76	
Largely unacceptable	0.63	0.60	1.11	
Considerably unacceptable	0.77	0.92	1.45	
Decidedly unacceptable	1.37	1.16	1.39	
Highly unacceptable	0.52	0.56	1.14	
Highly unacceptable	0.54	0.50	1.17	
Most unacceptable	0.82	0.75	1.20	
Wholly unacceptable	1.44	0.82	3.06	X
Very very unacceptable	0.57	0.55	1.09	
Exceptionally unacceptable	0.60	0.57	1.11	
Completely unacceptable	0.60	0.48	1.54	
Extremely unacceptable	0.48	0.56	1.34	
Totally unacceptable	0.35	0.42	1.43	
Absolutely unacceptable	0.29	0.26	1.27	
Entirely unacceptable	0.29	0.52	3.16	X

Table P-2. F_{MAX} values for working age males and college males for adequacy

Descriptor	SD		F_{MAX}	$F_{CRIT} (2.07)$
	WA Males	College Males		
Extremely adequate	0.82	0.47	3.07	X
Totally adequate	0.94	0.75	1.57	
Exceptionally adequate	0.89	0.73	1.50	
Entirely adequate	0.96	0.77	1.57	
Completely adequate	1.57	0.87	3.24	X
Fully adequate	0.96	0.76	1.60	
Very very adequate	0.95	0.71	1.80	
Absolutely adequate	2.02	0.69	8.59	X
Most adequate	1.16	1.10	1.11	
Highly adequate	0.74	0.54	1.89	
Wholly adequate	1.74	1.04	2.81	X
Perfectly adequate	1.88	0.91	4.25	X
Very adequate	0.78	0.74	1.11	
Decidedly adequate	1.49	1.17	1.62	
Substantially adequate	0.86	0.88	1.05	
Considerably adequate	0.74	0.72	1.05	
Quite adequate	0.98	0.71	1.90	
Largely adequate	1.63	0.60	7.40	X
Reasonably adequate	0.95	0.70	1.83	
Rather adequate	1.15	0.76	2.29	X
Pretty adequate	1.08	0.75	2.06	
Somewhat adequate	0.68	0.73	1.14	
Mildly adequate	0.74	0.72	1.07	
Slightly adequate	0.63	0.39	2.60	X
Barely adequate	0.77	0.28	7.62	X
Neutral	0.00	0.14	0.00	
Borderline	0.57	0.36	2.52	X
Barely inadequate	0.27	0.27	1.02	
Slightly inadequate	0.52	0.45	1.34	
Somewhat inadequate	0.86	0.72	1.43	
Mildly inadequate	0.79	0.68	1.35	
Fairly inadequate	0.94	0.79	1.41	
Rather inadequate	0.80	0.83	1.06	
Moderately inadequate	0.64	0.67	1.11	
Pretty inadequate	0.69	0.84	1.48	
Considerably inadequate	0.74	0.74	1.00	
Very inadequate	1.08	1.06	1.03	
Decidedly inadequate	0.80	1.12	1.98	
Most inadequate	1.22	0.82	2.22	X
Highly inadequate	0.56	1.37	6.02	X
Very very inadequate	1.33	0.56	5.68	X
Fully inadequate	1.07	0.63	2.90	X
Exceptionally inadequate	0.57	0.71	1.53	
Exceptionally inadequate	0.64	0.61	1.09	
Wholly inadequate	0.63	0.76	1.43	
Absolutely inadequate	1.17	0.44	7.07	X
Extremely inadequate	0.52	0.59	1.29	
Entirely inadequate	0.51	0.44	1.35	
Completely inadequate	1.11	0.49	5.09	X
Totally inadequate	0.50	0.41	1.52	

Table P-3. F_{MAX} values for working age males and college males for relative goodness

Descriptor	SD		F_{MAX}	$F_{CRIT} (2.07)$
	WA Males	College Males		
Absolutely best	0.14	0.44	10.45	X
Best of all	0.19	0.61	10.24	X
Truly best	0.64	0.82	1.65	
Best	0.74	1.04	1.96	
Decidedly best	0.75	1.16	2.42	X
Undoubtedly best	1.57	0.52	9.07	X
Extremely better	0.78	0.75	1.07	
Absolutely better	1.01	0.72	1.97	
Substantially better	0.69	0.76	1.21	
Decidedly better	0.73	0.88	1.46	
Conspicuously better	1.08	1.00	1.16	
Moderately better	0.66	0.71	1.17	
Rather better	0.78	0.84	1.15	
Somewhat better	0.68	0.61	1.23	
Slightly better	0.32	0.63	3.94	X
Barely better	0.48	0.49	1.05	
Absolutely alike	1.79	2.01	1.26	
Alike	0.76	1.08	2.01	
The same	0.00	0.14	0.00	
Neutral	0.19	0.68	12.72	X
Marginal	0.69	0.68	1.04	
Borderline	0.70	0.30	5.48	X
Barely worse	0.38	0.39	1.05	
Slightly worse	0.60	0.36	2.74	X
Somewhat worse	0.65	0.66	1.02	
Moderately worse	0.69	0.84	1.49	
Worse	0.84	0.94	1.25	
Noticeably worse	0.77	0.82	1.14	
Notably worse	0.76	0.94	1.51	
Conspicuously worse	0.80	1.04	1.68	
Much worse	0.77	0.69	1.23	
Decidedly worse	0.81	1.18	2.10	X
Largely worse	0.72	0.54	1.77	
Considerably worse	0.61	0.71	1.37	
Substantially worse	0.66	0.67	1.04	
Very much worse	0.56	0.61	1.17	
Decidedly worst	0.94	1.18	1.59	
Absolutely worse	0.81	0.67	1.46	
Undoubtedly worst	0.56	0.95	2.84	X
Absolutely worst	0.29	0.51	3.04	X
Worst of all	0.23	0.60	6.73	X

APPENDIX Q

Bivariate distributions of mean values for working age males and college males

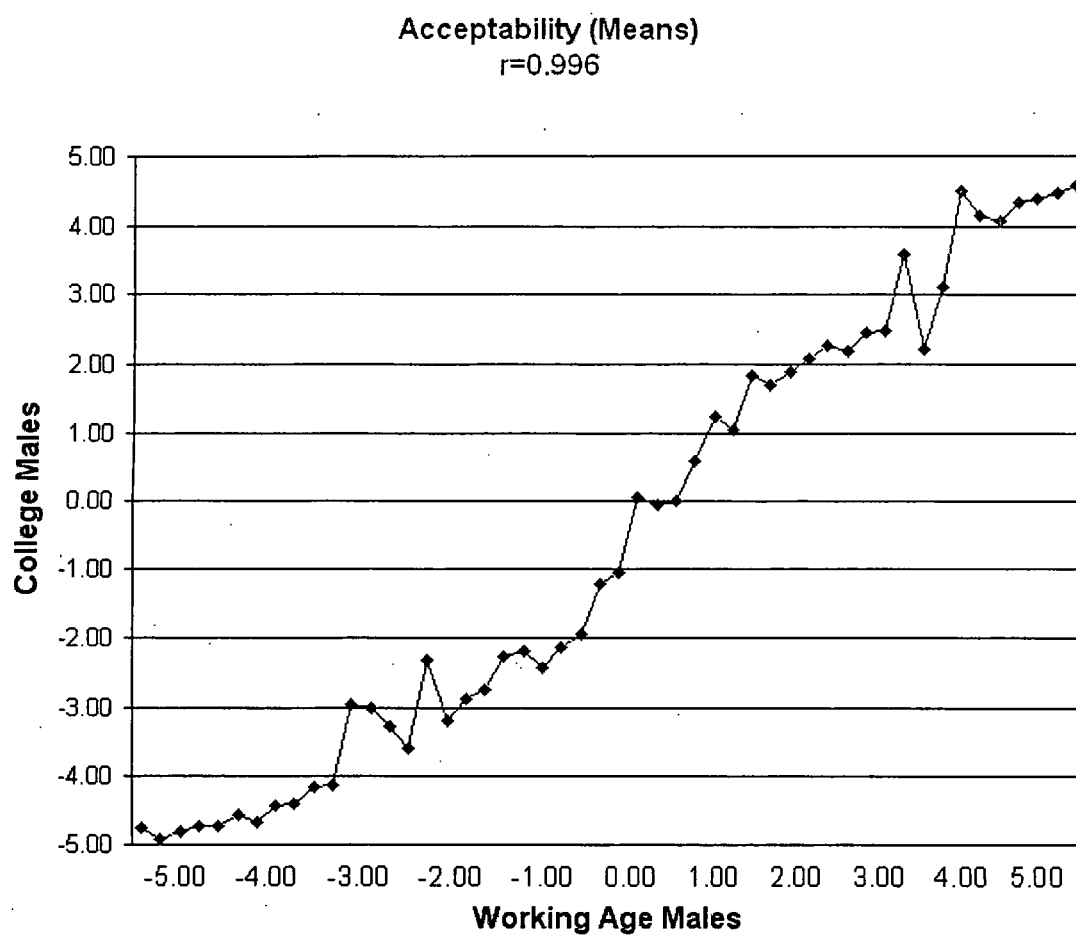


Figure Q-1. Bivariate distribution of mean values for acceptability response alternatives for working age males and college males

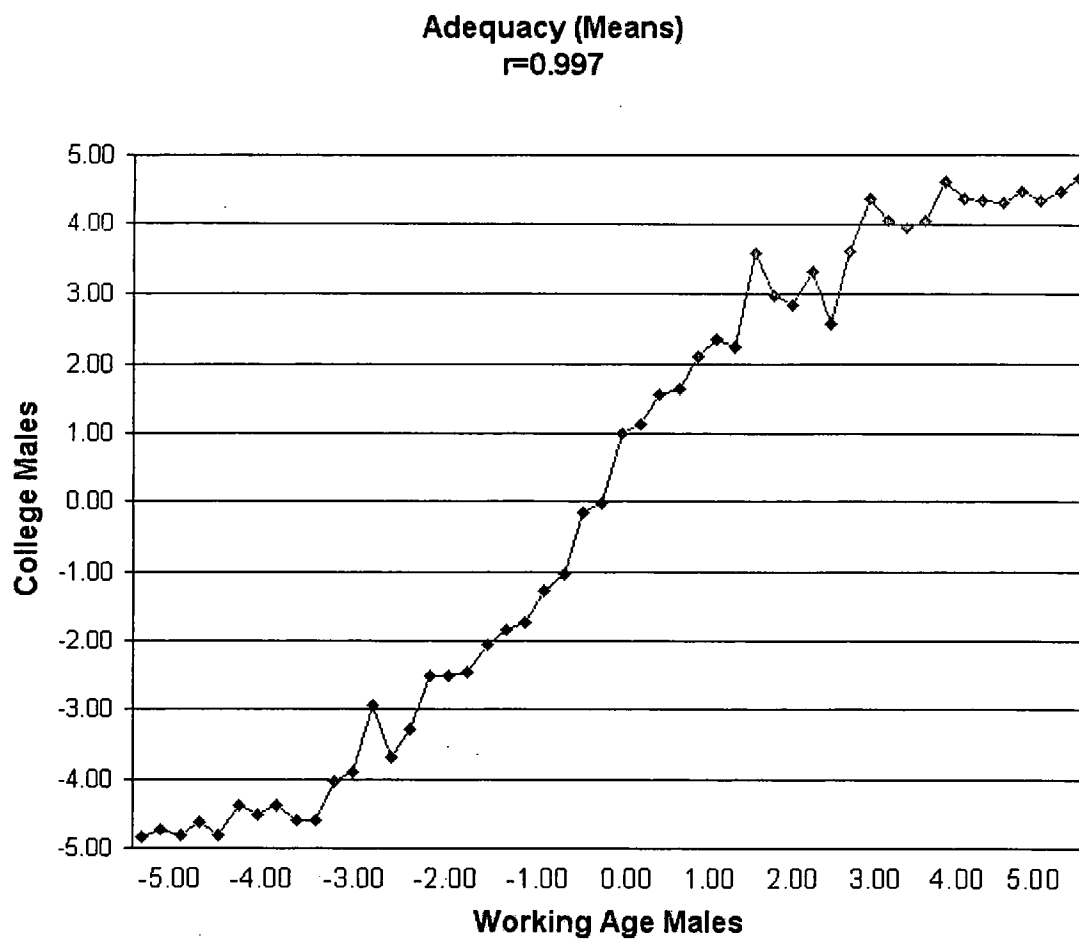


Figure Q-2. Bivariate distribution of mean values for adequacy response alternatives for working age males and college males

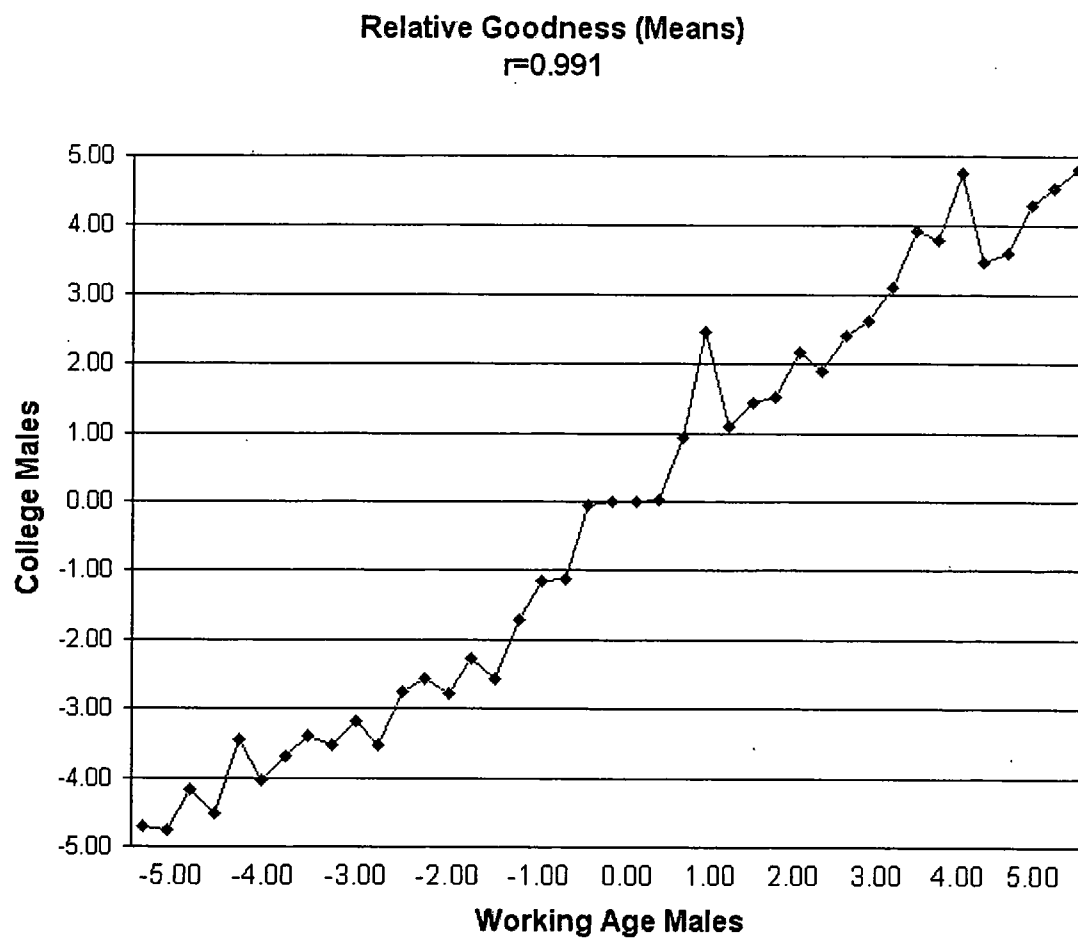


Figure Q-3. Bivariate distribution of mean values for relative goodness response alternatives for working age males and college males

APPENDIX R

 T_{PROB} values for working age females and college females

Table R-1. Comparison of the adequacy response alternative values for working age females and college females

Descriptors	WA Females			College Females			Diff*	t	t_{PROB}	Sig
	Mean	SD	N	Mean	SD	N				
Exceptionally adequate	4.57	0.60	54	4.51	0.70	53	0.06	0.48	0.635	
Totally adequate	4.48	0.69	54	4.80	0.56	54	0.32	2.65	0.009	X
Extremely adequate	4.35	1.47	54	4.91	0.30	53	0.56	2.74	0.008	X
Absolutely adequate	4.35	1.03	54	4.67	0.61	54	0.32	1.96	0.053	
Entirely adequate	4.28	1.28	54	4.83	0.42	54	0.55	3.00	0.004	X
Fully adequate	4.15	0.83	54	4.46	0.79	54	0.31	1.99	0.049	X
Wholly adequate	4.09	0.96	54	4.37	0.88	54	0.28	1.58	0.117	
Very very adequate	3.91	0.85	54	4.39	0.68	54	0.48	3.24	0.002	X
Highly adequate	3.89	1.37	54	4.30	0.54	54	0.41	2.05	0.045	X
Most adequate	3.80	1.11	54	4.06	0.94	54	0.26	1.31	0.192	
Completely adequate	3.76	2.07	54	4.46	0.82	54	0.70	2.31	0.024	X
Perfectly adequate	3.74	1.18	54	4.15	1.02	54	0.41	1.93	0.056	
Very adequate	3.37	1.42	54	3.72	0.63	54	0.35	1.66	0.102	
Largely adequate	3.22	1.11	54	3.87	0.55	54	0.65	3.86	0.000	X
Decidedly adequate	3.15	1.22	54	2.67	1.20	54	0.48	2.06	0.042	X
Considerably adequate	3.13	1.39	54	2.91	0.98	54	0.22	0.95	0.344	
Substantially adequate	3.11	1.76	54	3.13	0.78	54	0.02	0.08	0.939	
Quite adequate	2.96	0.99	54	3.11	0.84	54	0.15	0.85	0.398	
Reasonably adequate	2.48	0.72	54	2.43	0.72	54	0.05	0.36	0.719	
Pretty adequate	2.17	1.02	54	2.04	0.91	54	0.13	0.70	0.486	
Rather adequate	1.89	1.08	54	2.39	0.63	54	0.50	2.94	0.004	X
Somewhat adequate	1.57	0.96	54	1.78	0.74	54	0.21	1.27	0.206	
Mildly adequate	1.35	0.73	54	1.65	0.78	54	0.30	2.06	0.042	X
Slightly adequate	0.93	0.91	54	1.06	0.30	54	0.13	1.00	0.323	
Barely adequate	0.46	0.84	54	1.06	0.57	53	0.60	4.33	0.000	X
Neutral	0.00	0.00	54	0.00	0.00	54	0.00	0.00	1.000	
Borderline	-0.09	0.52	54	-0.07	0.26	54	0.02	0.25	0.801	
Barely inadequate	-1.04	0.39	54	-1.02	0.31	54	0.02	0.30	0.769	
Slightly inadequate	-1.30	0.57	54	-1.26	0.85	54	0.04	0.29	0.775	
Mildly inadequate	-1.50	0.91	54	-1.65	0.65	54	0.15	0.99	0.327	
Somewhat inadequate	-1.59	0.90	54	-1.91	0.69	53	0.32	2.06	0.042	X
Fairly inadequate	-2.35	0.99	54	-1.98	0.66	53	0.37	2.28	0.025	X
Pretty inadequate	-2.57	1.16	54	-2.55	0.85	53	0.02	0.10	0.919	
Rather inadequate	-2.59	0.66	54	-2.55	0.89	53	0.04	0.26	0.792	
Moderately inadequate	-2.63	0.68	54	-2.35	0.65	54	0.28	2.19	0.031	X
Decidedly inadequate	-3.43	1.06	54	-3.11	1.08	54	0.32	1.55	0.123	
Considerably inadequate	-3.46	1.18	54	-3.43	0.89	53	0.03	0.15	0.882	
Very inadequate	-3.87	0.80	54	-3.96	0.51	54	0.09	0.70	0.488	
Most inadequate	-4.19	0.73	54	-4.11	0.75	53	0.08	0.56	0.577	
Highly inadequate	-4.41	0.60	54	-4.57	0.57	54	0.16	1.42	0.158	
Fully inadequate	-4.48	1.42	54	-4.57	0.63	54	0.09	0.43	0.672	
Very very inadequate	-4.57	0.69	54	-4.57	0.60	54	0.00	0.00	1.000	
Wholly inadequate	-4.59	0.69	54	-4.54	0.72	54	0.05	0.37	0.713	
Exceptionally inadequate	-4.80	0.45	54	-4.17	1.00	54	0.63	4.22	0.000	X
Entirely inadequate	-4.83	0.38	54	-4.69	0.64	54	0.14	1.38	0.170	
Totally inadequate	-4.85	0.41	54	-4.93	0.26	54	0.08	1.21	0.229	
Exceptionally inadequate	-4.89	0.32	54	-4.67	0.61	54	0.22	2.35	0.021	X
Extremely inadequate	-4.89	0.32	54	-4.81	0.39	54	0.08	1.17	0.247	
Completely inadequate	-4.89	0.32	54	-4.81	0.48	54	0.08	1.02	0.311	
Absolutely inadequate	-4.98	0.14	54	-4.91	0.29	54	0.07	1.60	0.114	

*Absolute value of the difference. X: significant <0.05

Table R-2. Comparison of the relative goodness response alternative values for working age females and college females

Descriptors	WA Females			College Females			Diff*	t	t _{PROB}	Sig
	Mean	SD	N	Mean	SD	N				
Absolutely best	4.83	0.47	54	4.81	0.52	54	0.02	0.21	0.834	
Best of all	4.78	0.63	54	4.54	0.84	54	0.24	1.68	0.096	
Truly best	4.76	0.55	54	4.31	0.93	54	0.45	3.06	0.003	X
Undoubtedly best	4.61	0.96	54	4.75	0.68	53	0.14	0.87	0.387	
Decidedly best	4.30	0.92	54	3.63	1.05	54	0.67	3.53	0.001	X
Extremely better	4.30	0.69	54	3.98	0.63	54	0.32	2.52	0.013	X
Best	4.19	1.23	54	3.81	0.93	54	0.38	1.81	0.073	
Absolutely better	4.00	0.89	54	3.89	0.88	54	0.11	0.65	0.520	
Substantially better	3.35	0.78	54	2.98	0.77	53	0.37	2.47	0.015	X
Decidedly better	3.15	0.68	54	3.63	1.05	54	0.48	2.82	0.006	X
Conspicuously better	2.70	1.13	54	2.48	1.06	54	0.22	1.04	0.299	
Moderately better	2.24	0.64	54	1.94	0.74	54	0.30	2.25	0.026	X
Rather better	1.78	0.86	54	2.41	0.88	54	0.63	3.76	0.000	X
Somewhat better	1.63	0.62	54	1.81	0.73	54	0.18	1.38	0.170	
Absolutely alike	1.33	2.06	54	1.26	1.71	54	0.07	0.19	0.848	
Slightly better	1.24	0.51	54	1.41	0.57	54	0.17	1.63	0.105	
Barely better	0.85	0.49	54	1.06	0.41	54	0.21	2.42	0.017	X
Alike	0.13	0.52	54	0.61	0.94	54	0.48	3.28	0.002	X
Neutral	0.02	0.14	54	-0.02	0.14	54	0.04	1.48	0.141	
The same	0.00	0.00	54	0.02	0.14	54	0.02	1.05	0.296	
Borderline	-0.07	0.38	54	-0.19	0.48	54	0.12	1.44	0.153	
Marginal	-0.20	0.68	54	0.09	0.71	54	0.29	2.17	0.032	X
Barely worse	-1.11	0.42	54	-1.24	0.51	54	0.13	1.45	0.151	
Slightly worse	-1.31	0.51	54	-1.41	0.57	54	0.10	0.96	0.339	
Somewhat worse	-1.69	0.80	54	-1.91	0.87	54	0.22	1.37	0.174	
Worse	-2.52	1.18	54	-2.52	0.95	54	0.00	0.00	1.000	
Moderately worse	-2.70	0.60	54	-2.74	0.68	54	0.04	0.32	0.746	
Noticeably worse	-2.85	0.96	54	-2.96	0.87	54	0.11	0.62	0.534	
Notably worse	-3.04	0.87	54	-2.78	1.02	54	0.26	1.43	0.157	
Conspicuously worse	-3.26	0.99	54	-3.28	0.94	54	0.02	0.11	0.914	
Decidedly worse	-3.39	0.92	54	-3.83	0.86	54	0.44	2.57	0.012	X
Much worse	-3.41	0.71	54	-3.52	0.77	54	0.11	0.77	0.442	
Largely worse	-3.52	0.69	54	-3.69	0.70	54	0.17	1.27	0.207	
Considerably worse	-3.57	0.81	54	-3.56	0.84	54	0.01	0.06	0.950	
Decidedly worst	-3.78	1.34	54	-3.87	1.03	54	0.09	0.39	0.696	
Very much worse	-3.91	0.76	54	-4.00	0.75	54	0.09	0.62	0.537	
Substantially worse	-3.96	0.70	54	-3.61	0.81	54	0.35	2.40	0.018	X
Absolutely worse	-4.56	0.72	54	-4.59	0.63	54	0.03	0.23	0.818	
Undoubtedly worst	-4.57	0.74	54	-4.56	0.72	54	0.01	0.07	0.943	
Absolutely worst	-4.91	0.45	54	-4.87	0.39	54	0.04	0.49	0.623	
Worst of all	-4.94	0.23	54	-4.78	0.46	54	0.16	2.29	0.025	X

*Absolute value of the difference. X: significant <.05

APPENDIX S

 F_{MAX} values for working age females and college femalesTable S-1. F_{MAX} values for working age females and college females for acceptability

Descriptor	SD		F_{MAX}	$F_{CRIT} (2.07)$
	WA Females	College Females		
Extremely acceptable	1.28	0.63	4.16	X
Very very acceptable	0.74	0.66	1.26	
Completely acceptable	1.50	0.72	4.37	X
Fully acceptable	0.96	0.75	1.65	
Wholly acceptable	1.47	1.09	1.82	
Highly acceptable	1.29	0.52	6.14	X
Most acceptable	1.47	0.72	4.18	X
Quite acceptable	1.12	0.84	1.77	
Largely acceptable	1.94	0.70	7.70	X
Pretty acceptable	0.69	0.76	1.20	
Moderately acceptable	0.60	0.57	1.12	
Rather acceptable	0.90	0.82	1.20	
Acceptable	1.21	1.43	1.39	
Reasonably acceptable	1.11	0.77	2.10	X
Fairly acceptable	0.98	0.70	1.95	
Mildly acceptable	0.69	0.73	1.13	
Somewhat acceptable	1.05	0.67	2.45	X
Mildly acceptable	0.59	0.73	1.54	
Slightly acceptable	0.41	0.59	2.11	X
Sort of acceptable	0.63	0.52	1.45	
Barely acceptable	0.84	1.55	3.41	X
Neutral	0.00	0.14	--	
Borderline	0.38	0.27	1.99	
Marginal	0.64	0.27	5.56	X
Barely unacceptable	0.68	0.67	1.04	
Slightly unacceptable	0.63	0.67	1.15	
Somewhat unacceptable	0.74	0.76	1.06	
Moderately unacceptable	1.07	0.75	2.02	
Fairly unacceptable	0.86	0.85	1.01	
Rather unacceptable	1.00	1.14	1.29	
Reasonably unacceptable	0.81	0.81	1.01	
Pretty unacceptable	0.72	0.89	1.53	
Unacceptable	1.37	1.43	1.09	
Notably unacceptable	0.87	0.97	1.24	
Quite unacceptable	1.08	0.94	1.31	
Decidedly unacceptable	1.27	1.15	1.22	
Considerably unacceptable	1.25	0.86	2.13	X
Largely unacceptable	0.63	0.70	1.22	
Substantially unacceptable	0.77	0.98	1.61	
Most unacceptable	0.82	0.78	1.12	
Highly unacceptable	1.27	0.58	4.78	X
Highly unacceptable	0.54	0.64	1.40	
Very very unacceptable	0.56	0.53	1.13	
Wholly unacceptable	1.32	0.77	2.95	X
Exceptionally unacceptable	0.50	0.59	1.38	
Extremely unacceptable	0.34	0.43	1.61	
Totally unacceptable	0.19	0.54	8.02	X
Completely unacceptable	0.14	0.63	21.43	X
Absolutely unacceptable	0.00	0.59	--	
Entirely unacceptable	0.00	0.30	--	

Table S-2. F_{MAX} values for working age females and college females for adequacy

Descriptor	SD		F_{MAX}	F_{CRIT} (2.07)
	WA Females	College Females		
Exceptionally adequate	0.60	0.70	1.35	
Totally adequate	0.69	0.56	1.53	
Extremely adequate	1.47	0.30	23.97	X
Absolutely adequate	1.03	0.61	2.86	X
Entirely adequate	1.28	0.42	9.29	X
Fully adequate	0.83	0.79	1.11	
Wholly adequate	0.96	0.88	1.18	
Very very adequate	0.85	0.68	1.57	
Highly adequate	1.37	0.54	6.43	X
Most adequate	1.11	0.94	1.38	
Completely adequate	2.07	0.82	6.39	X
Perfectly adequate	1.18	1.02	1.35	
Very adequate	1.42	0.63	5.07	X
Largely adequate	1.11	0.55	4.08	X
Decidedly adequate	1.22	1.20	1.03	
Considerably adequate	1.39	0.98	2.01	
Substantially adequate	1.76	0.78	5.07	X
Quite adequate	0.99	0.84	1.39	
Reasonably adequate	0.72	0.72	1.00	
Pretty adequate	1.02	0.91	1.26	
Rather adequate	1.08	0.63	2.92	X
Somewhat adequate	0.96	0.74	1.70	
Mildly adequate	0.73	0.78	1.14	
Slightly adequate	0.91	0.30	9.16	X
Barely adequate	0.84	0.57	2.17	X
Neutral	0.00	0.00	--	
Borderline	0.52	0.26	4.06	X
Barely inadequate	0.39	0.31	1.56	
Slightly inadequate	0.57	0.85	2.22	X
Mildly inadequate	0.91	0.65	1.94	
Somewhat inadequate	0.90	0.69	1.71	
Fairly inadequate	0.99	0.66	2.27	X
Pretty inadequate	1.16	0.85	1.86	
Rather inadequate	0.66	0.89	1.82	
Moderately inadequate	0.68	0.65	1.10	
Decidedly inadequate	1.06	1.08	1.04	
Considerably inadequate	1.18	0.89	1.75	
Very inadequate	0.80	0.51	2.47	X
Most inadequate	0.73	0.75	1.06	
Highly inadequate	0.60	0.57	1.11	
Fully inadequate	1.42	0.63	5.11	X
Very very inadequate	0.69	0.60	1.32	
Wholly inadequate	0.69	0.72	1.10	
Exceptionally inadequate	0.45	1.00	4.93	X
Entirely inadequate	0.38	0.64	2.89	X
Totally inadequate	0.41	0.26	2.46	X
Exceptionally inadequate	0.32	0.61	3.70	X
Extremely inadequate	0.32	0.39	1.51	
Completely inadequate	0.32	0.48	2.29	X
Absolutely inadequate	0.14	0.29	4.54	X

Table S-3. F_{MAX} values for working age females and college females for relative goodness

Descriptor	SD		F_{MAX}	$F_{CRIT} (2.07)$
	WA Females	College Females		
Absolutely best	0.47	0.52	1.25	
Best of all	0.63	0.84	1.75	
Truly best	0.55	0.93	2.89	X
Undoubtedly best	0.96	0.68	1.99	
Decidedly best	0.92	1.05	1.29	
Extremely better	0.69	0.63	1.20	
Best	1.23	0.93	1.75	
Absolutely better	0.89	0.88	1.02	
Substantially better	0.78	0.77	1.03	
Decidedly better	0.68	1.05	2.35	X
Conspicuously better	1.13	1.06	1.13	
Moderately better	0.64	0.74	1.33	
Rather better	0.86	0.88	1.04	
Somewhat better	0.62	0.73	1.37	
Absolutely alike	2.06	1.71	1.45	
Slightly better	0.51	0.57	1.24	
Barely better	0.49	0.41	1.44	
Alike	0.52	0.94	3.32	X
Neutral	0.14	0.14	1.06	
The same	0.00	0.14	--	
Borderline	0.38	0.48	1.59	
Marginal	0.68	0.71	1.08	
Barely worse	0.42	0.51	1.48	
Slightly worse	0.51	0.57	1.26	
Somewhat worse	0.80	0.87	1.19	
Worse	1.18	0.95	1.54	
Moderately worse	0.60	0.68	1.27	
Noticeably worse	0.96	0.87	1.22	
Notably worse	0.87	1.02	1.38	
Conspicuously worse	0.99	0.94	1.12	
Decidedly worse	0.92	0.86	1.14	
Much worse	0.71	0.77	1.16	
Largely worse	0.69	0.70	1.02	
Considerably worse	0.81	0.84	1.06	
Decidedly worst	1.34	1.03	1.70	
Very much worse	0.76	0.75	1.02	
Substantially worse	0.70	0.81	1.34	
Absolutely worse	0.72	0.63	1.30	
Undoubtedly worst	0.74	0.72	1.06	
Absolutely worst	0.45	0.39	1.31	
Worst of all	0.23	0.46	3.96	X

APPENDIX T

Bivariate distributions of mean values for working age females and college females

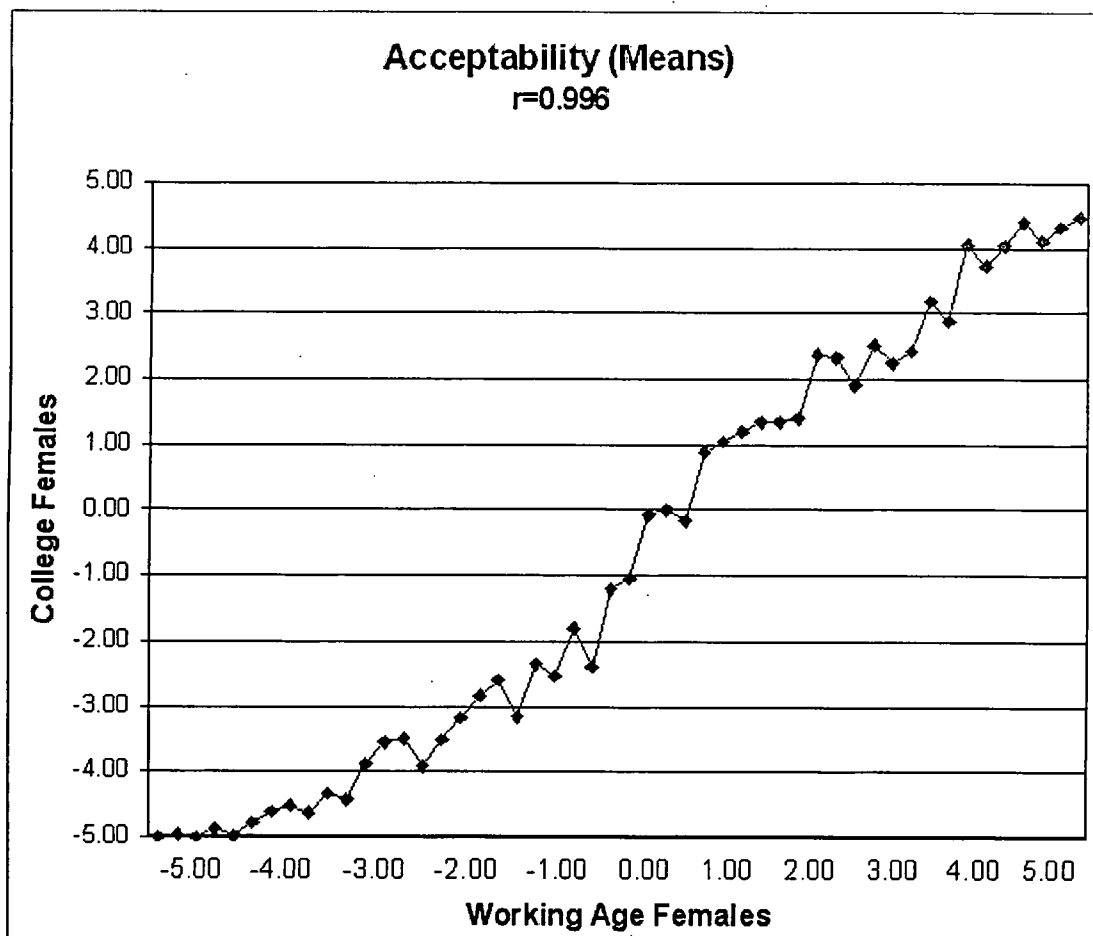


Figure T-1. Bivariate distribution of mean values for acceptability response alternatives for working age females and college females

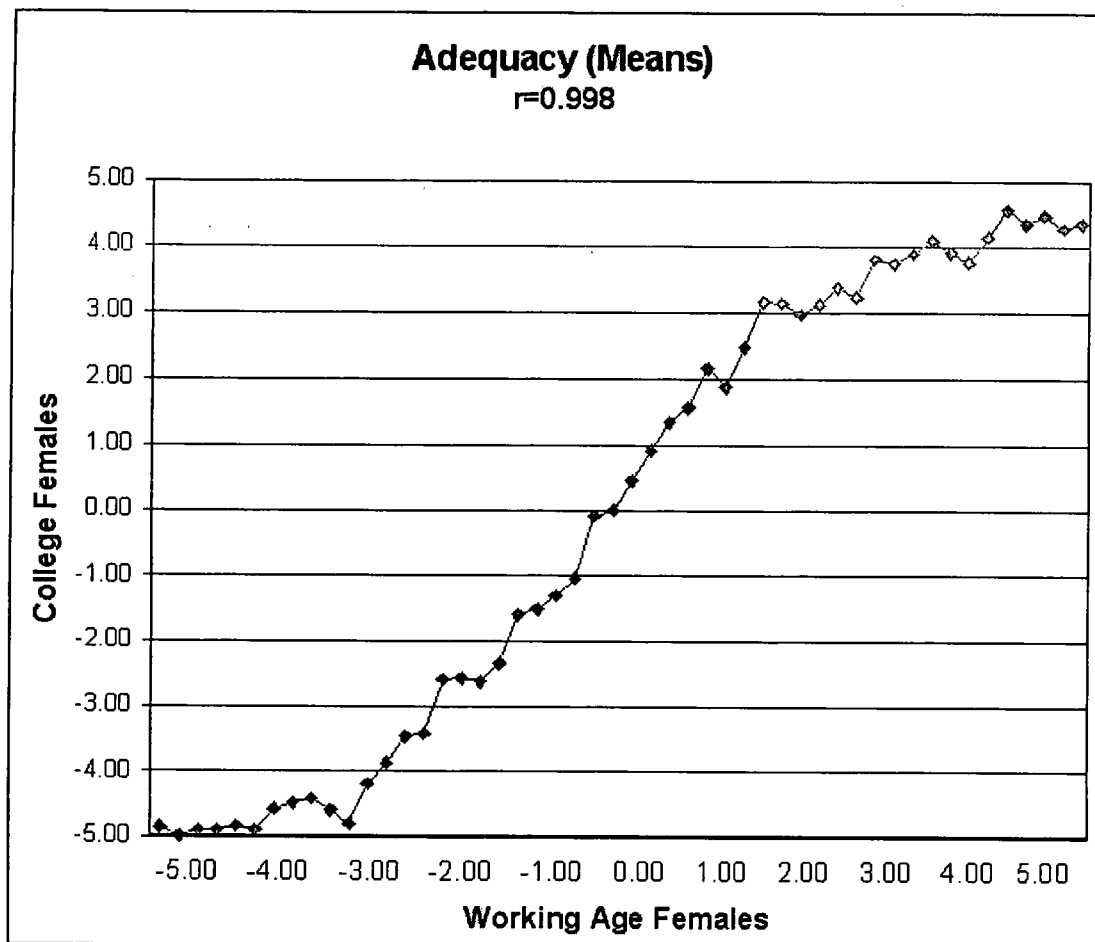
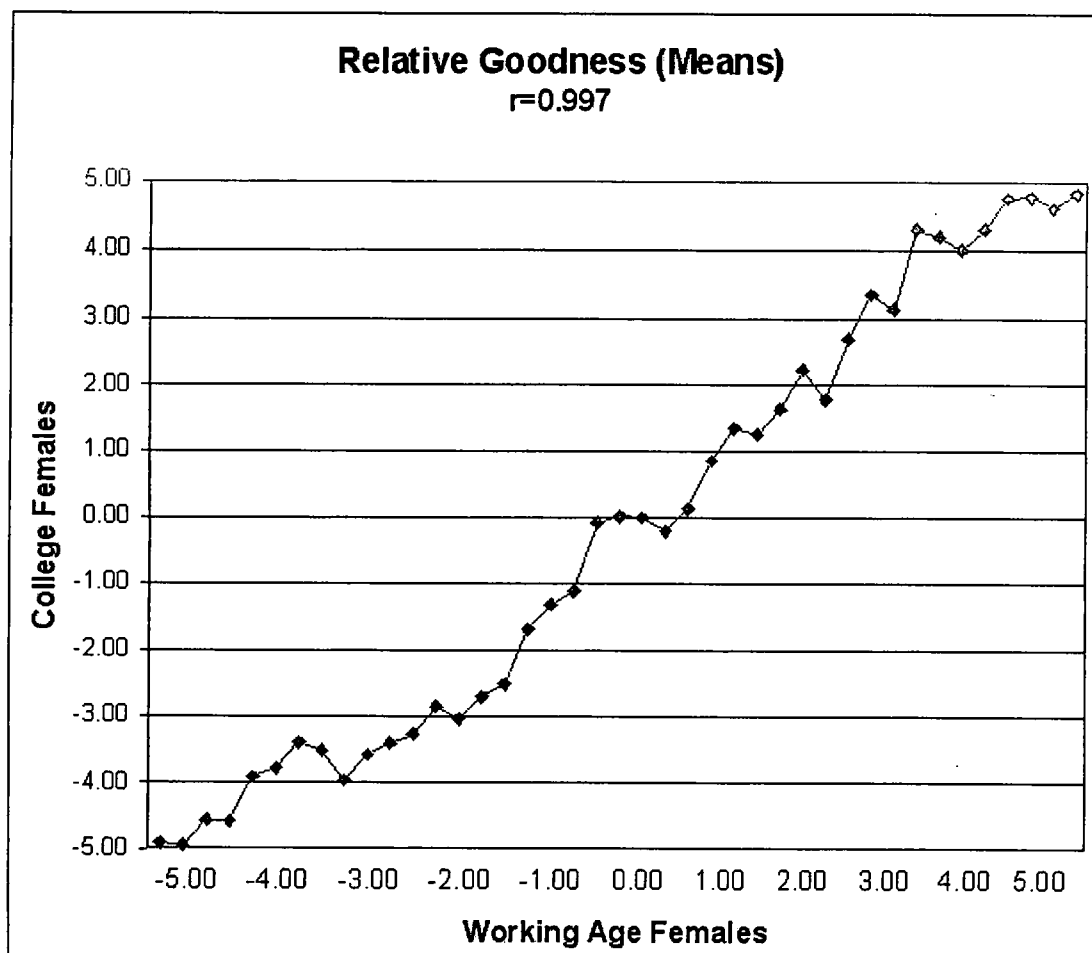


Figure T-2. Bivariate distribution of mean values for adequacy response alternatives for working age females and college females



FigureT-3. Bivariate distribution of mean values for relative goodness response alternatives for working age females and college females

APPENDIX U

T_{PROB} values for working age personnel and college students

Table U-1. Comparison of the adequacy response alternative values for working age personnel and college students

Descriptors	WA Personnel			College Students			Diff*	t	t _{PROB}	Sig
	Mean	SD	N	Mean	SD	N				
Exceptionally adequate	4.36	1.03	107	4.43	0.72	107	0.07	0.62	0.539	
Extremely adequate	4.32	1.10	107	4.79	0.41	107	0.47	4.18	0.000	X
Totally adequate	4.30	0.88	107	4.65	0.67	107	0.35	3.28	0.001	X
Absolutely adequate	4.17	1.32	107	4.64	0.65	107	0.47	3.31	0.001	X
Entirely adequate	4.13	0.95	107	4.66	0.64	107	0.53	4.77	0.000	X
Fully adequate	3.96	0.96	107	4.41	0.77	107	0.45	3.76	0.000	X
Very very adequate	3.85	1.03	107	4.39	0.69	107	0.54	4.51	0.000	X
Completely adequate	3.83	1.50	107	4.4	0.84	107	0.57	3.42	0.001	X
Highly adequate	3.73	1.15	107	4.19	0.55	107	0.46	3.73	0.000	X
Most adequate	3.57	1.18	107	4.01	1.02	107	0.44	2.91	0.004	X
Perfectly adequate	3.49	1.64	107	4.25	0.97	107	0.76	4.15	0.000	X
Very adequate	3.48	0.79	107	3.67	0.68	107	0.19	1.91	0.057	
Wholly adequate	3.48	1.89	107	4.22	0.97	107	0.74	3.62	0.000	X
Considerably adequate	3.02	1.03	107	2.87	0.85	107	0.15	1.15	0.250	
Quite adequate	3.00	0.94	107	3.04	0.78	107	0.04	0.34	0.735	
Decidedly adequate	2.97	1.46	107	2.62	1.18	107	0.35	1.94	0.053	
Largely adequate	2.91	1.23	107	3.72	0.6	107	0.81	6.14	0.000	X
Substantially adequate	2.89	1.63	107	3.22	0.83	107	0.33	1.88	0.062	
Reasonably adequate	2.27	1.09	107	2.34	0.71	107	0.07	0.55	0.583	
Pretty adequate	1.98	1.05	107	2.07	0.83	107	0.09	0.68	0.495	
Rather adequate	1.68	1.29	107	2.37	0.69	107	0.69	4.85	0.000	X
Mildly adequate	1.47	0.80	107	1.61	0.75	107	0.14	1.34	0.181	
Somewhat adequate	1.38	0.98	107	1.71	0.74	107	0.33	2.76	0.006	X
Slightly adequate	0.94	0.71	107	1.09	0.35	107	0.15	1.91	0.059	
Barely adequate	0.62	0.82	107	1.03	0.45	107	0.41	4.57	0.000	X
Neutral	-0.01	0.10	107	-0.01	0.1	107	0.00	0.05	0.961	
Borderline	-0.10	0.79	107	-0.11	0.32	107	0.01	0.09	0.930	
Barely inadequate	-1.07	0.33	107	-1.03	0.29	107	0.04	1.06	0.291	
Slightly inadequate	-1.20	0.46	107	-1.27	0.68	107	0.07	0.93	0.356	
Somewhat inadequate	-1.52	0.88	107	-1.87	0.7	107	0.35	3.18	0.002	X
Mildly inadequate	-1.55	0.83	107	-1.69	0.66	107	0.14	1.36	0.177	
Fairly inadequate	-2.21	0.95	107	-2.02	0.73	107	0.19	1.60	0.110	
Rather inadequate	-2.42	0.91	107	-2.5	0.86	107	0.08	0.66	0.513	
Moderately inadequate	-2.60	0.63	107	-2.43	0.66	107	0.17	1.91	0.057	
Pretty inadequate	-2.64	0.95	107	-2.52	0.84	107	0.12	1.02	0.311	
Considerably inadequate	-3.47	0.97	107	-3.36	0.82	107	0.11	0.87	0.384	
Decidedly inadequate	-3.70	0.83	107	-3.03	1.1	107	0.67	5.04	0.000	X
Very inadequate	-3.75	0.93	107	-3.82	0.84	107	0.07	0.60	0.552	
Most inadequate	-4.00	1.04	107	-4	0.79	107	0.00	0.00	1.000	
Highly inadequate	-4.08	1.05	107	-4.31	1.07	107	0.23	1.56	0.120	
Fully inadequate	-4.24	1.58	107	-4.58	0.63	107	0.34	2.05	0.043	X
Very very inadequate	-4.39	1.04	107	-4.59	0.58	107	0.20	1.71	0.089	
Wholly inadequate	-4.60	0.67	107	-4.46	0.74	107	0.14	1.43	0.154	
Exceptionally inadequate	-4.61	0.64	107	-4.28	0.87	107	0.33	3.14	0.002	X
Extremely inadequate	-4.69	0.52	107	-4.72	0.51	107	0.03	0.40	0.687	
Exceptionally inadequate	-4.70	0.50	107	-4.59	0.61	107	0.11	1.46	0.147	
Entirely inadequate	-4.75	0.55	107	-4.75	0.55	107	0.00	0.03	0.975	
Completely inadequate	-4.82	0.43	107	-4.77	0.49	107	0.05	0.83	0.407	
Totally inadequate	-4.83	0.47	107	-4.89	0.34	107	0.06	1.04	0.297	
Absolutely inadequate	-4.85	0.45	107	-4.86	0.37	107	0.01	0.17	0.866	

*Absolute value of the difference. X: significant <.05

Table U-2. Comparison of the adequacy response alternative values for working age personnel and college students

Descriptors	WA Personnel			College Students			Diff*	t	t _{PROB}	Sig
	Mean	SD	N	Mean	SD	N				
Absolutely best	4.90	0.36	107	4.81	0.48	107	0.09	1.50	0.135	
Best of all	4.87	0.46	107	4.54	0.73	107	0.33	3.95	0.000	X
Truly best	4.64	0.65	107	4.31	0.87	107	0.33	3.19	0.002	X
Undoubtedly best	4.51	1.28	107	4.75	0.6	107	0.24	1.72	0.087	
Decidedly best	4.37	0.92	107	3.56	1.11	107	0.81	5.85	0.000	X
Best	4.29	1.04	107	3.71	0.99	107	0.58	4.18	0.000	X
Extremely better	4.03	1.10	107	3.9	0.7	107	0.13	1.01	0.312	
Absolutely better	3.83	0.99	107	3.91	0.8	107	0.08	0.64	0.525	
Substantially better	3.31	0.77	107	3.04	0.76	107	0.27	2.57	0.011	X
Decidedly better	3.10	0.80	107	2.61	0.84	107	0.49	4.39	0.000	X
Conspicuously better	2.58	1.06	107	2.44	1.02	107	0.14	0.98	0.329	
Moderately better	2.09	0.73	107	1.93	0.72	107	0.16	1.64	0.101	
Rather better	1.82	0.88	107	2.29	0.87	107	0.47	3.91	0.000	X
Somewhat better	1.62	0.75	107	1.67	0.68	107	0.05	0.54	0.587	
Absolutely alike	1.22	2.09	107	1.86	1.95	107	0.64	2.30	0.022	X
Slightly better	1.19	0.55	107	1.43	0.6	107	0.24	3.09	0.002	X
Barely better	0.91	0.47	107	1.07	0.45	107	0.16	2.61	0.010	X
Alike	0.26	0.85	107	0.77	1.02	107	0.51	3.96	0.000	X
The same	0.08	0.57	107	0.02	0.14	107	0.06	1.13	0.260	
Neutral	-0.02	0.19	107	-0.01	0.1	107	0.01	0.41	0.680	
Marginal	-0.10	0.85	107	0.05	0.69	107	0.15	1.45	0.149	
Borderline	-0.11	0.77	107	-0.12	0.4	107	0.01	0.09	0.925	
Barely worse	-1.07	0.41	107	-1.19	0.46	107	0.12	1.94	0.053	
Slightly worse	-1.28	0.49	107	-1.28	0.49	107	0.00	0.01	0.996	
Somewhat worse	-1.75	0.71	107	-1.81	0.78	107	0.06	0.61	0.543	
Worse	-2.47	1.12	107	-2.39	0.95	107	0.08	0.54	0.586	
Moderately worse	-2.49	0.66	107	-2.66	0.76	107	0.17	1.78	0.076	
Noticeably worse	-2.74	0.86	107	-2.87	0.84	107	0.13	1.13	0.259	
Notably worse	-2.93	0.83	107	-2.68	0.98	107	0.25	2.05	0.041	X
Conspicuously worse	-3.20	1.05	107	-3.02	1.02	107	0.18	1.25	0.214	
Decidedly worse	-3.37	0.96	107	-3.51	1.08	107	0.14	0.98	0.330	
Largely worse	-3.42	0.78	107	-3.6	0.63	107	0.18	1.85	0.065	
Considerably worse	-3.48	0.69	107	-3.47	0.78	107	0.01	0.07	0.948	
Much worse	-3.48	0.71	107	-3.53	0.73	107	0.05	0.54	0.587	
Substantially worse	-3.69	0.73	107	-3.64	0.74	107	0.05	0.51	0.609	
Decidedly worst	-3.88	1.23	107	-3.67	1.12	107	0.21	1.30	0.195	
Very much worse	-3.93	0.68	107	-4.02	0.68	107	0.09	1.02	0.310	
Absolutely worse	-4.42	1.01	107	-4.56	0.65	107	0.14	1.20	0.231	
Undoubtedly worst	-4.48	0.87	107	-4.36	0.86	107	0.12	0.98	0.326	
Worst of all	-4.85	0.99	107	-4.74	0.54	107	0.11	1.01	0.312	
Absolutely worst	-4.92	0.28	107	-4.81	0.46	107	0.11	2.04	0.043	X

*Absolute value of the difference. X: significant <0.05

APPENDIX V

 F_{MAX} values for working age personnel and college studentsTable V-1. F_{MAX} values for working age personnel and college students for acceptability

Descriptor	SD		F_{MAX}	F_{CRIT} (2.07)
	WA Personnel	College Students		
Completely acceptable	1.18	0.73	2.59	X
Very very acceptable	1.19	0.75	2.50	X
Extremely acceptable	2.03	0.59	11.84	X
Fully acceptable	0.91	0.73	1.54	
Highly acceptable	1.22	0.51	5.71	X
Wholly acceptable	1.69	0.95	3.18	X
Most acceptable	1.46	0.77	3.57	X
Quite acceptable	1.28	0.89	2.08	X
Largely acceptable	1.66	0.71	5.49	X
Acceptable	1.26	1.26	1.01	
Pretty acceptable	0.74	0.74	1.01	
Rather acceptable	0.98	0.78	1.59	
Reasonably acceptable	0.94	0.74	1.60	
Moderately acceptable	0.86	0.64	1.81	
Fairly acceptable	0.81	0.72	1.26	
Mildly acceptable	0.88	0.74	1.42	
Mildly acceptable	0.64	0.73	1.29	
Somewhat acceptable	0.70	0.62	1.27	
Slightly acceptable	0.49	0.55	1.26	
Sort of acceptable	0.68	0.58	1.37	
Barely acceptable	0.75	1.36	3.31	X
Neutral	0.17	0.10	0.00	
Marginal	1.01	0.37	7.38	X
Borderline	0.62	0.35	3.13	X
Barely unacceptable	0.69	0.51	1.84	
Slightly unacceptable	0.43	0.65	2.28	X
Somewhat unacceptable	0.78	0.74	1.11	
Rather unacceptable	0.87	0.98	1.26	
Fairly unacceptable	0.87	0.79	1.21	
Moderately unacceptable	0.74	0.70	1.13	
Reasonably unacceptable	0.85	0.79	1.16	
Pretty unacceptable	0.86	0.84	1.06	
Notably unacceptable	0.96	0.95	1.03	
Unacceptable	1.33	1.30	1.05	
Quite unacceptable	1.27	0.85	2.24	X
Considerably unacceptable	1.06	0.93	1.31	
Largely unacceptable	0.66	0.66	1.00	
Substantially unacceptable	0.77	0.96	1.56	
Decidedly unacceptable	0.96	1.15	1.44	
Most unacceptable	0.91	0.76	1.42	
Highly unacceptable	0.67	0.58	1.35	
Highly unacceptable	0.61	0.59	1.05	
Very very unacceptable	0.60	0.54	1.23	
Exceptionally unacceptable	0.60	0.58	1.09	
Wholly unacceptable	0.63	0.79	1.58	
Completely unacceptable	0.48	0.56	1.37	
Extremely unacceptable	0.41	0.50	1.50	
Entirely unacceptable	0.44	0.43	1.07	
Totally unacceptable	0.39	0.48	1.51	
Absolutely unacceptable	0.25	0.46	3.43	X

Table V-2. F_{MAX} values for working age personnel and college students for adequacy

Descriptor	SD		F_{MAX}	F_{CRIT} (2.07)
	WA Personnel	College Students		
Exceptionally adequate	1.03	0.72	2.05	
Extremely adequate	1.10	0.41	7.14	X
Totally adequate	0.88	0.67	1.73	
Absolutely adequate	1.32	0.65	4.13	X
Entirely adequate	0.95	0.64	2.21	X
Fully adequate	0.96	0.77	1.56	
Very very adequate	1.03	0.69	2.21	X
Completely adequate	1.50	0.84	3.20	X
Highly adequate	1.15	0.55	4.40	X
Most adequate	1.18	1.02	1.34	
Perfectly adequate	1.64	0.97	2.85	X
Very adequate	0.79	0.68	1.36	
Wholly adequate	1.89	0.97	3.80	X
Considerably adequate	1.03	0.85	1.46	
Quite adequate	0.94	0.78	1.46	
Decidedly adequate	1.46	1.18	1.52	
Largely adequate	1.23	0.60	4.22	X
Substantially adequate	1.63	0.83	3.84	X
Reasonably adequate	1.09	0.71	2.34	X
Pretty adequate	1.05	0.83	1.62	
Rather adequate	1.29	0.69	3.51	X
Mildly adequate	0.80	0.75	1.15	
Somewhat adequate	0.98	0.74	1.75	
Slightly adequate	0.71	0.35	4.13	X
Barely adequate	0.82	0.45	3.32	X
Neutral	0.10	0.10	1.07	
Borderline	0.79	0.32	6.07	X
Barely inadequate	0.33	0.29	1.28	
Slightly inadequate	0.46	0.68	2.14	X
Somewhat inadequate	0.88	0.70	1.59	
Mildly inadequate	0.83	0.66	1.57	
Fairly inadequate	0.95	0.73	1.69	
Rather inadequate	0.91	0.86	1.12	
Moderately inadequate	0.63	0.66	1.11	
Pretty inadequate	0.95	0.84	1.29	
Considerably inadequate	0.97	0.82	1.41	
Decidedly inadequate	0.83	1.10	1.77	
Very inadequate	0.93	0.84	1.23	
Most inadequate	1.04	0.79	0.00	
Highly inadequate	1.05	1.07	1.04	
Fully inadequate	1.58	0.63	6.32	X
Very very inadequate	1.04	0.58	3.24	X
Wholly inadequate	0.67	0.74	1.22	
Exceptionally inadequate	0.64	0.87	1.84	
Extremely inadequate	0.52	0.51	1.05	
Exceptionally inadequate	0.50	0.61	1.49	
Entirely inadequate	0.55	0.55	1.00	
Completely inadequate	0.43	0.49	1.30	
Totally inadequate	0.47	0.34	1.87	
Absolutely inadequate	0.45	0.37	1.49	

Table V-3. F_{MAX} values for working age personnel and college students for relative goodness

Descriptor	SD		F_{MAX}	$F_{CRIT} (2.07)$
	WA Personnel	College Students		
Absolutely best	0.36	0.48	1.76	
Best of all	0.46	0.73	2.55	X
Truly best	0.65	0.87	1.80	
Undoubtedly best	1.28	0.60	4.58	X
Decidedly best	0.92	1.11	1.47	
Best	1.04	0.99	1.10	
Extremely better	1.10	0.70	2.48	X
Absolutely better	0.99	0.80	1.52	
Substantially better	0.77	0.76	1.03	
Decidedly better	0.80	0.84	1.10	
Conspicuously better	1.06	1.02	1.09	
Moderately better	0.73	0.72	1.04	
Rather better	0.88	0.87	1.02	
Somewhat better	0.75	0.68	1.21	
Absolutely alike	2.09	1.95	1.15	
Slightly better	0.55	0.60	0.00	
Barely better	0.47	0.45	1.07	
Alike	0.85	1.02	1.44	
The same	0.57	0.14	16.48	X
Neutral	0.19	0.10	3.74	X
Marginal	0.85	0.69	1.50	
Borderline	0.77	0.40	3.69	X
Barely worse	0.41	0.46	1.29	
Slightly worse	0.49	0.49	1.01	
Somewhat worse	0.71	0.78	1.19	
Worse	1.12	0.95	1.39	
Moderately worse	0.66	0.76	1.31	
Noticeably worse	0.86	0.84	1.05	
Notably worse	0.83	0.98	1.40	
Conspicuously worse	1.05	1.02	1.06	
Decidedly worse	0.96	1.08	1.27	
Largely worse	0.78	0.63	1.52	
Considerably worse	0.69	0.78	1.27	
Much worse	0.71	0.73	1.07	
Substantially worse	0.73	0.74	1.02	
Decidedly worst	1.23	1.12	1.20	
Very much worse	0.68	0.68	1.01	
Absolutely worse	1.01	0.65	2.41	X
Undoubtedly worst	0.87	0.86	1.03	
Worst of all	0.99	0.54	3.35	X
Absolutely worst	0.28	0.46	2.72	X

APPENDIX W

Bivariate distributions of mean values for working age personnel and college students

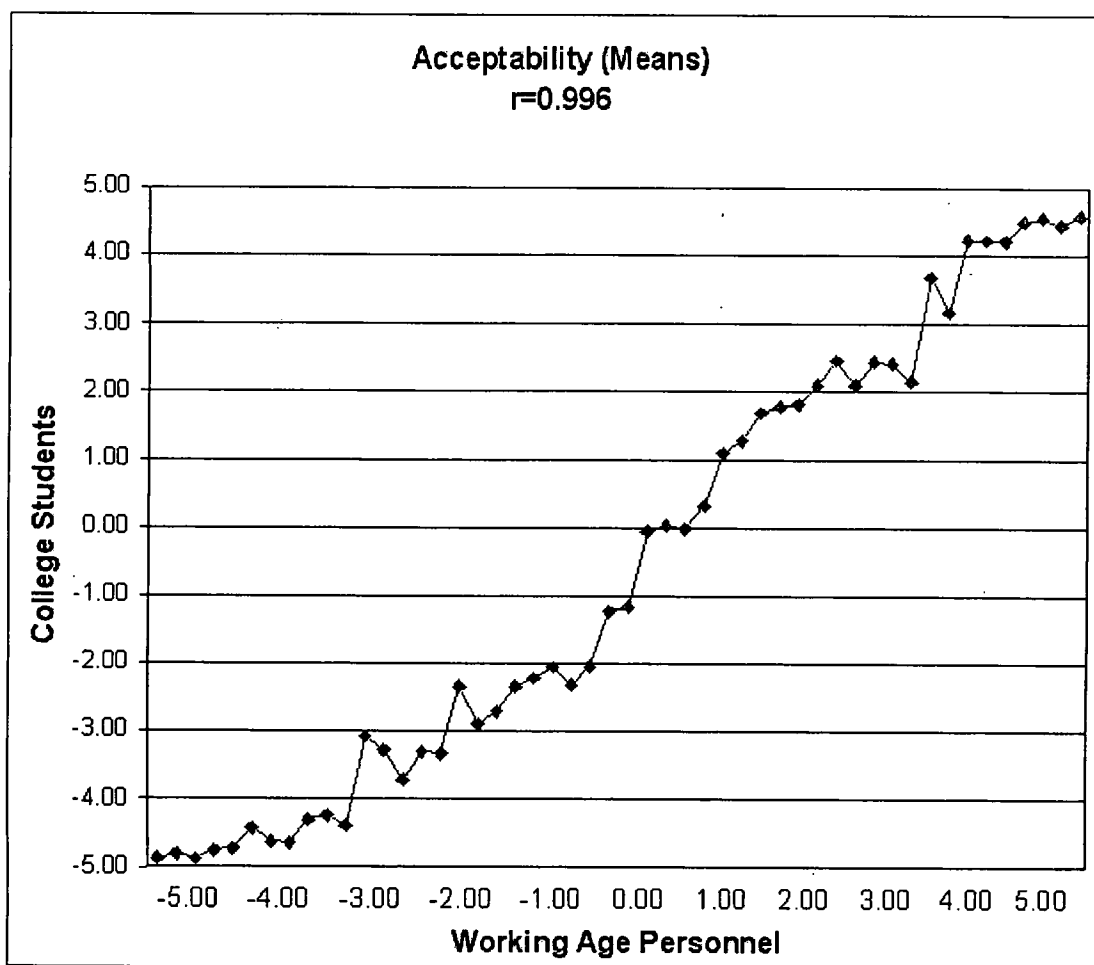
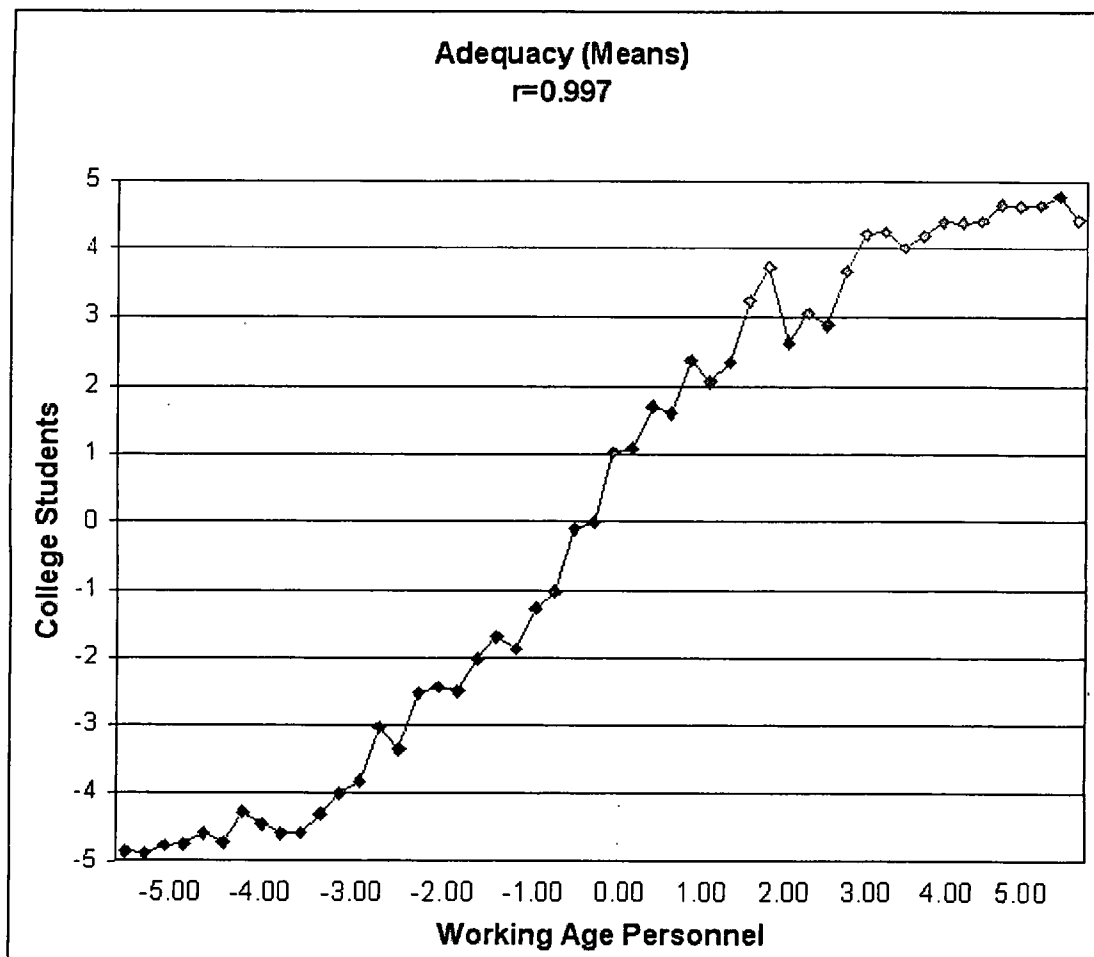


Figure W-1. Bivariate distribution of mean values for acceptability response alternatives for working age personnel and college students



FigureW-2. Bivariate distribution of mean values for adequacy response alternatives for working age personnel and college students

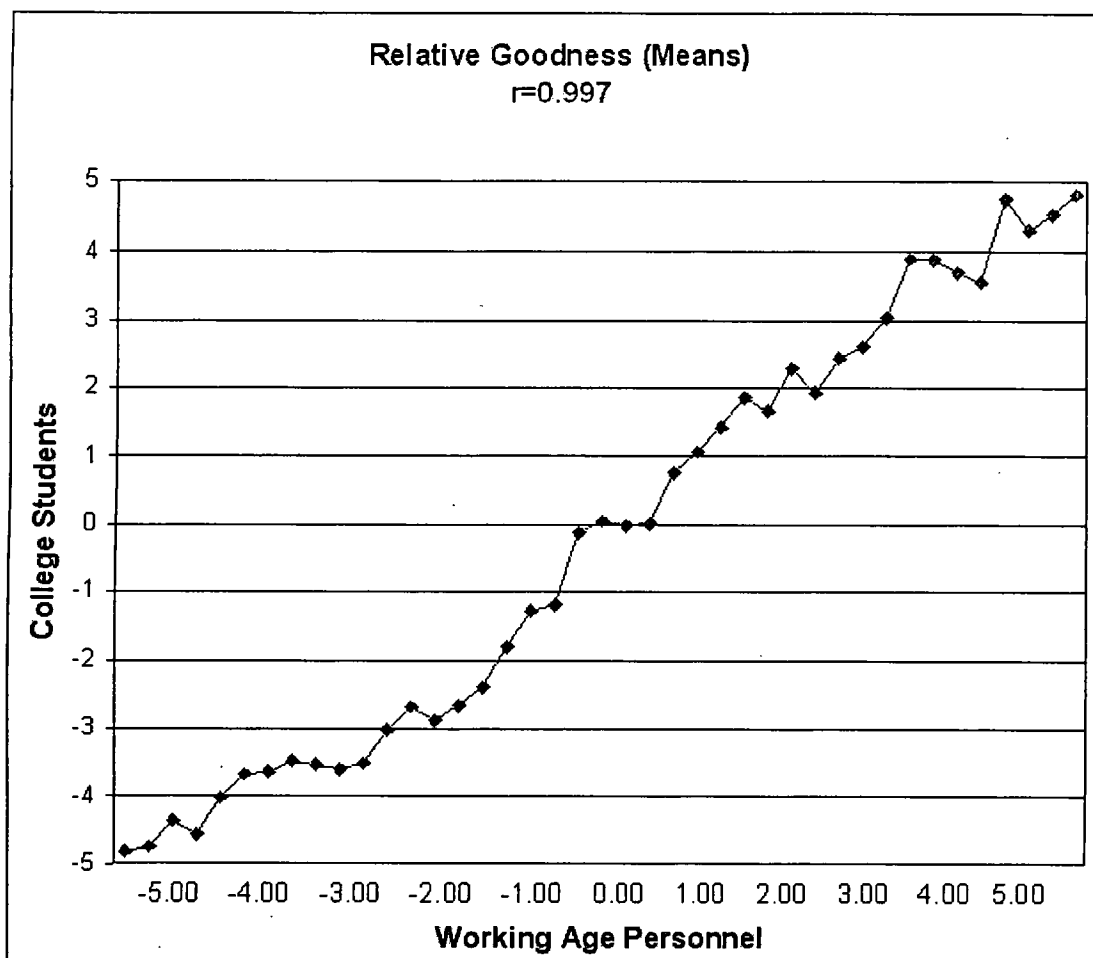


Figure W-3. Bivariate distribution of mean values for relative goodness response alternatives for working age personnel and college students

APPENDIX X

T_{PROB} values for working age males and working age females

Table X-1. Comparison of the adequacy response alternative values for working age males and working age females

Descriptors	WA Males			WA Females			Diff*	t	t _{PROB}	Sig
	Mean	SD	N	Mean	SD	N				
Extremely adequate	4.33	0.82	54	4.35	1.47	54	0.02	-0.08	0.936	
Totally adequate	4.28	0.94	54	4.48	0.69	54	0.20	-1.28	0.203	
Exceptionally adequate	4.26	0.89	54	4.57	0.60	54	0.31	-2.15	0.034	X
Entirely adequate	4.11	0.96	54	4.28	1.28	54	0.17	-0.76	0.447	
Completely adequate	4.00	1.57	54	3.76	2.07	54	0.24	0.68	0.497	
Fully adequate	3.98	0.96	54	4.15	0.83	54	0.17	-0.96	0.338	
Very very adequate	3.81	0.95	54	3.91	0.85	54	0.09	-0.53	0.596	
Absolutely adequate	3.72	2.02	54	4.35	1.03	54	0.63	-2.04	0.045	X
Most adequate	3.70	1.16	54	3.80	1.11	54	0.09	-0.42	0.672	
Highly adequate	3.70	0.74	54	3.89	1.37	54	0.19	-0.87	0.385	
Wholly adequate	3.57	1.74	54	4.09	0.96	54	0.52	-1.92	0.059	
Perfectly adequate	3.37	1.88	54	3.74	1.18	54	0.37	-1.23	0.223	
Very adequate	3.19	0.78	54	3.37	1.42	54	0.19	-0.84	0.403	
Decidedly adequate	3.11	1.49	54	3.15	1.22	54	0.04	-0.14	0.888	
Substantially adequate	3.02	0.86	54	3.11	1.76	54	0.09	-0.35	0.729	
Considerably adequate	2.98	0.74	54	3.13	1.39	54	0.15	-0.69	0.491	
Quite adequate	2.85	0.98	54	2.96	0.99	54	0.11	-0.59	0.559	
Largely adequate	2.70	1.63	54	3.22	1.11	54	0.52	-1.93	0.057	
Reasonably adequate	2.31	0.95	54	2.48	0.72	54	0.17	-1.03	0.306	
Rather adequate	1.87	1.15	54	1.89	1.08	54	0.02	-0.09	0.931	
Pretty adequate	1.83	1.08	54	2.17	1.02	54	0.33	-1.65	0.102	
Somewhat adequate	1.61	0.68	54	1.57	0.96	54	0.04	0.23	0.818	
Mildly adequate	1.44	0.74	54	1.35	0.73	54	0.09	0.65	0.516	
Slightly adequate	1.02	0.63	54	0.93	0.91	54	0.09	0.62	0.539	
Barely adequate	0.69	0.77	54	0.46	0.84	54	0.22	1.43	0.156	
Neutral	0.00	0.00	54	0.00	0.00	54	0.00	--	--	
Borderline	-0.11	0.57	54	-0.09	0.52	54	0.02	-0.18	0.861	
Barely inadequate	-1.04	0.27	54	-1.04	0.39	54	0.00	0.00	1.000	
Slightly inadequate	-1.26	0.52	54	-1.30	0.57	54	0.04	0.35	0.725	
Somewhat inadequate	-1.57	0.86	54	-1.59	0.90	54	0.02	0.11	0.913	
Mildly inadequate	-1.57	0.79	54	-1.50	0.91	54	0.07	-0.45	0.652	
Fairly inadequate	-2.20	0.94	54	-2.35	0.99	54	0.15	0.80	0.428	
Rather inadequate	-2.35	0.80	54	-2.59	0.66	54	0.24	1.70	0.092	
Moderately inadequate	-2.54	0.64	54	-2.63	0.68	54	0.09	0.73	0.467	
Pretty inadequate	-2.57	0.69	54	-2.57	1.16	54	0.00	0.00	1.000	
Considerably inadequate	-3.41	0.74	54	-3.46	1.18	54	0.06	0.62	0.539	
Very inadequate	-3.54	1.08	54	-3.87	0.80	54	0.33	1.82	0.071	
Decidedly inadequate	-3.83	0.80	54	-3.43	1.06	54	0.41	-2.26	0.026	X
Most inadequate	-3.98	1.22	54	-4.19	0.73	54	0.20	1.05	0.295	
Highly inadequate	-4.09	0.56	54	-4.41	0.60	54	0.31	2.82	0.006	X
Very very inadequate	-4.26	1.33	54	-4.57	0.69	54	0.31	1.54	0.128	
Fully inadequate	-4.41	1.07	54	-4.48	1.42	54	0.07	0.31	0.761	
Exceptionally inadequate	-4.52	0.57	54	-4.80	0.45	54	0.28	2.44	0.016	X
Exceptionally inadequate	-4.54	0.64	54	-4.89	0.32	54	0.35	4.15	0.000	X
Wholly inadequate	-4.56	0.63	54	-4.59	0.69	54	0.04	0.29	0.772	
Absolutely inadequate	-4.63	1.17	54	-4.98	0.14	54	0.35	2.19	0.033	X
Extremely inadequate	-4.65	0.52	54	-4.89	0.32	54	0.24	2.91	0.005	X
Entirely inadequate	-4.76	0.51	54	-4.83	0.38	54	0.07	0.86	0.393	
Completely inadequate	-4.80	1.11	54	-4.89	0.32	54	0.09	0.59	0.556	
Totally inadequate	-4.83	0.50	54	-4.85	0.41	54	0.02	0.21	0.834	

*Absolute value of the difference. X: significant <.05

Table X-2. Comparison of the relative goodness response alternative values for working age males and working age females

Descriptors	WA Males			WA Females			Diff*	t	t _{PROB}	Sig
	Mean	SD	N	Mean	SD	N				
Absolutely best	4.98	0.14	54	4.83	0.47	54	0.15	2.24	0.028	X
Best of all	4.96	0.19	54	4.78	0.63	54	0.19	2.05	0.044	X
Truly best	4.69	0.64	54	4.76	0.55	54	0.07	-0.65	0.519	
Best	4.57	0.74	54	4.19	1.23	54	0.39	1.99	0.050	X
Decidedly best	4.46	0.75	54	4.30	0.92	54	0.17	1.03	0.305	
Undoubtedly best	4.33	1.57	54	4.61	0.96	54	0.28	-1.11	0.269	
Extremely better	4.04	0.78	54	4.30	0.69	54	0.26	-1.83	0.069	
Absolutely better	3.67	1.01	54	4.00	0.89	54	0.33	-1.82	0.072	
Substantially better	3.30	0.69	54	3.35	0.78	54	0.06	-0.39	0.696	
Decidedly better	3.13	0.73	54	3.15	0.68	54	0.02	-0.14	0.892	
Conspicuously better	2.44	1.08	54	2.70	1.13	54	0.26	-1.22	0.224	
Moderately better	2.06	0.66	54	2.24	0.64	54	0.19	-1.48	0.141	
Rather better	1.91	0.78	54	1.78	0.86	54	0.13	0.82	0.415	
Somewhat better	1.65	0.68	54	1.63	0.62	54	0.02	0.15	0.883	
Slightly better	1.11	0.32	54	1.24	0.51	54	0.13	-1.58	0.117	
Barely better	0.87	0.48	54	0.85	0.49	54	0.02	0.20	0.843	
Absolutely alike	0.78	1.79	54	1.33	2.06	54	0.56	-1.50	0.137	
Alike	0.20	0.76	54	0.13	0.52	54	0.07	0.59	0.555	
The same	0.00	0.00	54	0.00	0.00	54	0.00	--	--	
Neutral	-0.04	0.19	54	0.02	0.14	54	0.06	-1.74	0.084	
Marginal	-0.17	0.69	54	-0.20	0.68	54	0.04	0.28	0.780	
Borderline	-0.19	0.70	54	-0.07	0.38	54	0.11	-1.02	0.310	
Barely worse	-1.07	0.38	54	-1.11	0.42	54	0.04	0.48	0.632	
Slightly worse	-1.28	0.60	54	-1.31	0.51	54	0.04	0.35	0.729	
Somewhat worse	-1.63	0.65	54	-1.69	0.80	54	0.06	0.40	0.693	
Moderately worse	-2.41	0.69	54	-2.70	0.60	54	0.30	2.38	0.019	X
Worse	-2.52	0.84	54	-2.52	1.18	54	0.00	0.00	1.000	
Noticeably worse	-2.70	0.77	54	-2.85	0.96	54	0.15	0.89	0.378	
Notably worse	-3.02	0.76	54	-3.04	0.87	54	0.02	0.12	0.907	
Conspicuously worse	-3.19	0.80	54	-3.26	0.99	54	0.07	0.43	0.671	
Much worse	-3.41	0.77	54	-3.41	0.71	54	0.00	0.00	1.000	
Decidedly worse	-3.43	0.81	54	-3.39	0.92	54	0.04	-0.22	0.825	
Largely worse	-3.46	0.72	54	-3.52	0.69	54	0.06	0.41	0.684	
Considerably worse	-3.52	0.61	54	-3.57	0.81	54	0.06	0.40	0.689	
Substantially worse	-3.61	0.66	54	-3.96	0.70	54	0.35	2.70	0.008	X
Very much worse	-3.94	0.56	54	-3.91	0.76	54	0.04	-0.29	0.774	
Decidedly worst	-4.09	0.94	54	-3.78	1.34	54	0.31	-0.22	0.825	
Absolutely worse	-4.39	0.81	54	-4.56	0.72	54	0.17	1.13	0.261	
Undoubtedly worst	-4.72	0.56	54	-4.57	0.74	54	0.15	-1.17	0.245	
Absolutely worst	-4.91	0.29	54	-4.91	0.45	54	0.00	0.00	1.000	
Worst of all	-4.94	0.23	54	-4.94	0.23	54	0.00	0.00	1.000	

*Absolute value of the difference. X: significant <0.05

APPENDIX Y

 F_{MAX} values for working age males and working age femalesTable Y-1. F_{MAX} values for working age males and working age females for acceptability

Descriptor	SD		F_{MAX}	$F_{CRIT} (2.07)$
	WA Males	WA Females		
Completely acceptable	1.48	1.50	1.03	X
Fully acceptable	0.90	0.96	1.15	
Very very acceptable	1.45	0.74	3.82	X
Wholly acceptable	0.99	1.47	2.21	
Highly acceptable	1.14	1.29	1.28	
Most acceptable	1.34	1.47	1.20	X
Extremely acceptable	2.73	1.28	4.51	X
Quite acceptable	1.29	1.12	1.33	
Acceptable	1.25	1.21	1.06	X
Largely acceptable	1.90	1.94	1.05	
Pretty acceptable	0.66	0.69	1.12	
Reasonably acceptable	0.73	1.11	2.36	
Rather acceptable	1.19	0.90	1.77	
Moderately acceptable	1.16	0.60	3.75	X
Fairly acceptable	0.68	0.98	2.04	
Mildly acceptable	0.61	0.69	1.29	
Somewhat acceptable	0.73	1.05	2.08	X
Mildly acceptable	0.99	0.59	2.82	
Sort of acceptable	0.59	0.63	1.12	X
Slightly acceptable	0.57	0.41	1.94	
Barely acceptable	0.59	0.84	1.99	X
Neutral	0.19	0.00	0.00	
Borderline	0.70	0.38	3.39	
Marginal	0.97	0.64	2.31	X
Barely unacceptable	0.49	0.68	1.91	
Slightly unacceptable	0.39	0.63	2.55	
Somewhat unacceptable	0.91	0.74	1.52	
Fairly unacceptable	0.66	0.86	1.66	
Rather unacceptable	0.86	1.00	1.38	
Moderately unacceptable	0.69	1.07	2.38	
Reasonably unacceptable	0.93	0.81	1.30	
Pretty unacceptable	1.11	0.72	2.38	
Notably unacceptable	0.93	0.87	1.14	
Quite unacceptable	1.09	1.08	1.03	
Unacceptable	1.13	1.37	1.48	
Substantially unacceptable	0.72	0.77	1.17	
Largely unacceptable	0.63	0.63	1.01	X
Considerably unacceptable	0.77	1.25	2.68	
Decidedly unacceptable	1.37	1.27	1.16	
Highly unacceptable	0.52	1.27	5.86	
Highly unacceptable	0.54	0.54	1.00	X
Most unacceptable	0.82	0.82	1.00	
Wholly unacceptable	1.44	1.32	1.18	
Very very unacceptable	0.57	0.56	1.04	X
Exceptionally unacceptable	0.60	0.50	1.43	
Completely unacceptable	0.60	0.14	19.19	
Extremely unacceptable	0.48	0.34	2.03	X
Totally unacceptable	0.35	0.19	3.39	X
Absolutely unacceptable	0.29	0.00	0.00	
Entirely unacceptable	0.29	0.00	0.00	

Table Y-2. F_{MAX} values for working age males and working age females for adequacy

Descriptor	SD		F_{MAX}	$F_{CRIT} (2.07)$
	WA Males	WA Females		
Extremely adequate	0.82	1.47	3.18	X
Totally adequate	0.94	0.69	1.84	
Exceptionally adequate	0.89	0.60	2.21	X
Entirely adequate	0.96	1.28	1.76	
Completely adequate	1.57	2.07	1.75	
Fully adequate	0.96	0.83	1.33	
Very very adequate	0.95	0.85	1.25	
Absolutely adequate	2.02	1.03	3.85	X
Most adequate	1.16	1.11	1.10	
Highly adequate	0.74	1.37	3.39	X
Wholly adequate	1.74	0.96	3.32	X
Perfectly adequate	1.88	1.18	2.51	X
Very adequate	0.78	1.42	3.32	X
Decidedly adequate	1.49	1.22	1.49	
Substantially adequate	0.86	1.76	4.19	X
Considerably adequate	0.74	1.39	3.52	X
Quite adequate	0.98	0.99	1.02	
Largely adequate	1.63	1.11	2.16	X
Reasonably adequate	0.95	0.72	1.73	
Rather adequate	1.15	1.08	1.14	
Pretty adequate	1.08	1.02	1.11	
Somewhat adequate	0.68	0.96	1.98	
Mildly adequate	0.74	0.73	1.04	
Slightly adequate	0.63	0.91	2.08	X
Barely adequate	0.77	0.84	1.18	
Neutral	0.00	0.00	0.00	
Borderline	0.57	0.52	1.19	
Barely inadequate	0.27	0.39	2.02	
Slightly inadequate	0.52	0.57	1.20	
Somewhat inadequate	0.86	0.90	1.10	
Mildly inadequate	0.79	0.91	1.31	
Fairly inadequate	0.94	0.99	1.12	
Rather inadequate	0.80	0.66	1.49	
Moderately inadequate	0.64	0.68	1.15	
Pretty inadequate	0.69	1.16	2.83	X
Considerably inadequate	0.74	1.18	2.53	X
Very inadequate	1.08	0.80	1.80	
Decidedly inadequate	0.80	1.06	1.77	
Most inadequate	1.22	0.73	2.81	X
Highly inadequate	0.56	0.60	1.15	
Very very inadequate	1.33	0.69	3.74	X
Fully inadequate	1.07	1.42	1.76	
Exceptionally inadequate	0.57	0.45	1.62	
Exceptionally inadequate	0.64	0.32	4.02	X
Wholly inadequate	0.63	0.69	1.17	
Absolutely inadequate	1.17	0.14	73.96	X
Extremely inadequate	0.52	0.32	2.68	X
Entirely inadequate	0.51	0.38	1.85	
Completely inadequate	1.11	0.32	12.14	X
Totally inadequate	0.50	0.41	1.53	

Table Y-3. F_{MAX} values for working age males and working age females for relative goodness

Descriptor	SD		F_{MAX}	$F_{CRIT} (2.07)$
	WA Males	WA Females		
Absolutely best	0.14	0.47	11.72	X
Best of all	0.19	0.63	11.08	X
Truly best	0.64	0.55	1.36	
Best	0.74	1.23	2.74	X
Decidedly best	0.75	0.92	1.54	
Undoubtedly best	1.57	0.96	2.66	X
Extremely better	0.78	0.69	1.26	
Absolutely better	1.01	0.89	1.29	
Substantially better	0.69	0.78	1.28	
Decidedly better	0.73	0.68	1.13	
Conspicuously better	1.08	1.13	1.10	
Moderately better	0.66	0.64	1.04	
Rather better	0.78	0.86	1.21	
Somewhat better	0.68	0.62	1.18	
Slightly better	0.32	0.51	2.60	X
Barely better	0.48	0.49	1.06	
Absolutely alike	1.79	2.06	1.32	
Alike	0.76	0.52	2.18	X
The same	0.00	0.00	0.00	
Neutral	0.19	0.14	1.96	
Marginal	0.69	0.68	1.03	
Borderline	0.70	0.38	3.39	X
Barely worse	0.38	0.42	1.21	
Slightly worse	0.60	0.51	1.38	
Somewhat worse	0.65	0.80	1.49	
Moderately worse	0.69	0.60	1.30	
Worse	0.84	1.18	1.96	
Noticeably worse	0.77	0.96	1.56	
Notably worse	0.76	0.87	1.29	
Conspicuously worse	0.80	0.99	1.53	
Much worse	0.77	0.71	1.15	
Decidedly worse	0.81	0.92	1.27	
Largely worse	0.72	0.69	1.08	
Considerably worse	0.61	0.81	1.81	
Substantially worse	0.66	0.70	1.14	
Very much worse	0.56	0.76	1.81	
Decidedly worst	0.94	1.34	2.05	
Absolutely worse	0.81	0.72	1.27	
Undoubtedly worst	0.56	0.74	1.73	
Absolutely worst	0.29	0.45	2.32	X
Worst of all	0.23	0.23	1.00	

APPENDIX Z

Bivariate distributions of mean values for working age males and working age females

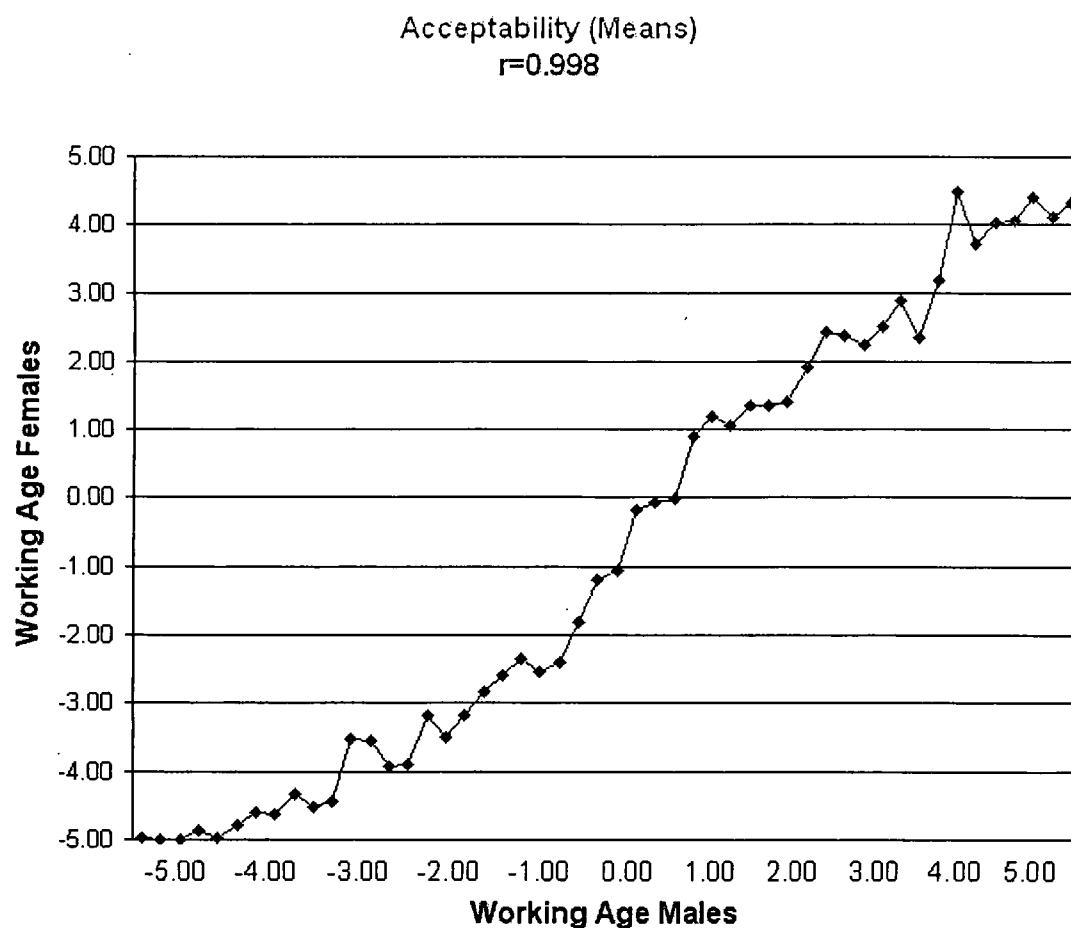


Figure Z-1. Bivariate distribution of mean values for acceptability response alternatives for working age males and working age females

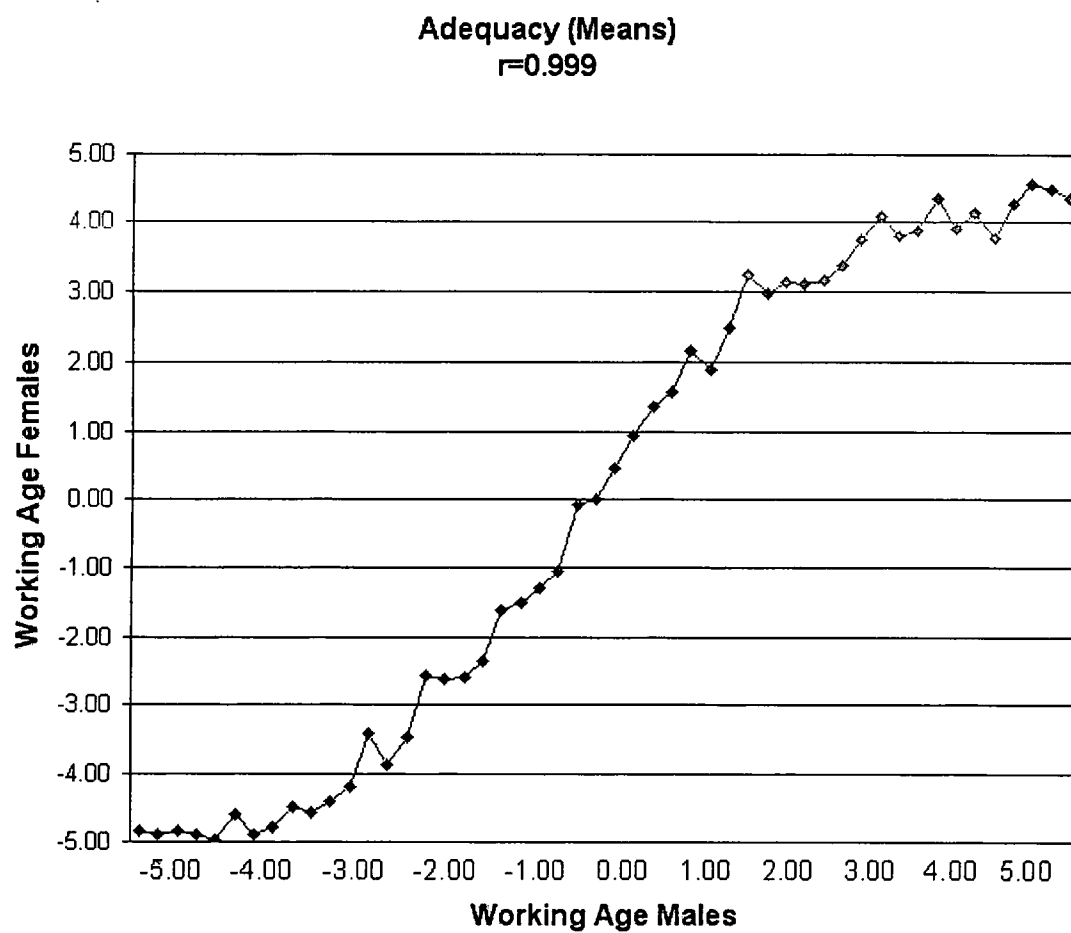


Figure Z-2. Bivariate distribution of mean values for adequacy response alternatives for working age males and working age females

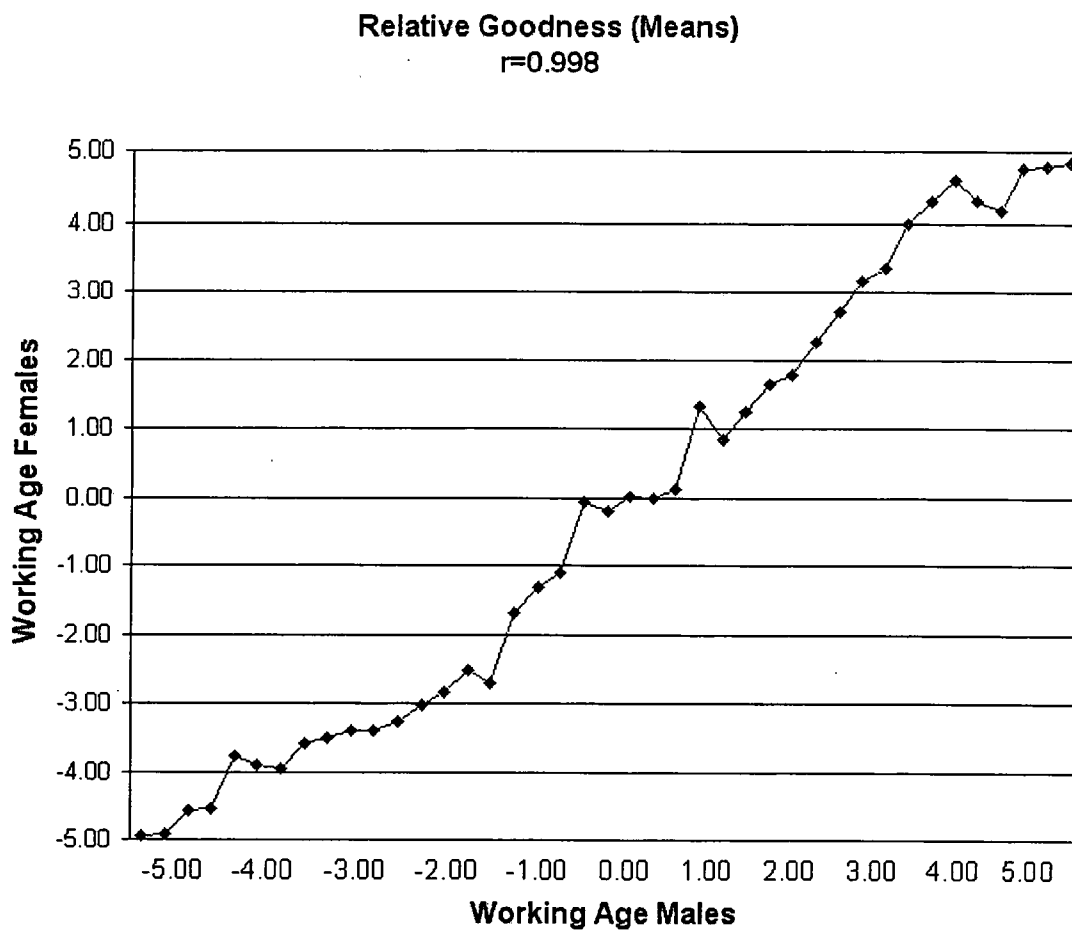


Figure Z-3. Bivariate distribution of mean values for relative goodness response alternatives for working age males and working females

APPENDIX AA

T_{PROB} values for working age technical staff and managers

Table AA-1. Comparison of the adequacy response alternative values for technical staff and managers

Descriptors	Technical Staff			Managers			Diff*	t	t _{PROB}	Sig
	Mean	SD	N	Mean	SD	N				
Extremely adequate	4.47	0.73	59	4.10	0.80	59	0.37	2.62	0.010	X
Exceptionally adequate	4.41	0.79	59	3.97	1.34	59	0.44	2.17	0.032	X
Totally adequate	4.32	0.86	59	4.12	1.00	59	0.20	1.16	0.247	
Entirely adequate	4.20	0.91	59	3.88	1.15	59	0.32	1.68	0.096	
Absolutely adequate	4.17	1.12	59	3.76	1.96	59	0.41	1.40	0.166	
Fully adequate	4.05	0.90	59	3.80	1.14	59	0.25	1.32	0.189	
Very very adequate	3.92	0.88	59	3.69	1.09	59	0.22	1.26	0.210	
Perfectly adequate	3.90	1.06	59	3.25	1.90	59	0.64	2.29	0.024	X
Most adequate	3.86	1.06	59	3.58	1.21	59	0.29	1.34	0.184	
Highly adequate	3.81	0.66	59	3.69	0.79	59	0.12	0.90	0.372	
Completely adequate	3.76	1.60	59	3.73	1.73	59	0.03	0.10	0.922	
Wholly adequate	3.42	2.36	59	3.51	1.55	59	0.08	0.24	0.807	
Very adequate	3.42	0.70	59	3.24	0.77	59	0.19	1.33	0.187	
Decidedly adequate	3.17	1.38	59	3.02	1.37	59	0.15	0.59	0.555	
Considerably adequate	3.05	1.17	59	2.90	0.71	59	0.15	0.84	0.402	
Quite adequate	3.00	0.83	59	2.76	0.84	59	0.24	1.56	0.121	
Substantially adequate	2.98	1.42	59	2.86	1.44	59	0.12	0.46	0.649	
Largely adequate	2.73	1.44	59	3.02	0.71	59	0.29	1.39	0.169	
Reasonably adequate	2.51	0.82	59	2.27	0.78	59	0.24	1.63	0.106	
Pretty adequate	1.97	1.23	59	1.86	0.80	59	0.10	0.58	0.566	
Rather adequate	1.81	1.40	59	1.32	1.37	59	0.49	1.92	0.057	
Somewhat adequate	1.51	0.88	59	1.31	0.91	59	0.20	1.21	0.227	
Mildly adequate	1.37	0.69	59	1.44	0.65	59	0.07	0.57	0.572	
Slightly adequate	0.75	0.82	59	0.88	0.59	59	0.14	0.99	0.325	
Barely adequate	0.47	0.82	59	0.73	0.69	59	0.25	1.86	0.065	
Neutral	-0.02	0.13	59	0.00	0.00	59	0.02	1.18	0.240	
Borderline	-0.14	0.57	59	-0.08	0.97	59	0.05	0.41	0.683	
Barely inadequate	-1.03	0.26	59	-1.08	0.34	59	0.05	0.90	0.371	
Slightly inadequate	-1.15	0.41	59	-1.14	0.39	59	0.02	0.14	0.892	
Somewhat inadequate	-1.61	0.93	59	-1.56	0.77	59	0.05	0.32	0.751	
Mildly inadequate	-1.63	0.67	59	-1.49	0.68	59	0.14	1.13	0.262	
Fairly inadequate	-2.19	1.09	59	-2.14	0.97	59	0.05	0.26	0.793	
Rather inadequate	-2.51	0.73	59	-2.24	0.97	59	0.27	1.71	0.090	
Moderately inadequate	-2.58	0.56	59	-2.51	0.60	59	0.07	0.66	0.514	
Pretty inadequate	-2.58	0.91	59	-2.53	0.97	59	0.05	0.29	0.773	
Considerably inadequate	-3.47	1.16	59	-3.46	0.82	59	0.02	0.05	0.957	
Very inadequate	-3.71	0.97	59	-3.68	0.71	59	0.03	0.19	0.848	
Decidedly inadequate	-3.80	0.85	59	-3.75	0.92	59	0.05	0.31	0.760	
Highly inadequate	-3.85	1.61	59	-3.97	0.69	59	0.12	0.53	0.600	
Most inadequate	-4.12	1.20	59	-4.00	1.20	59	0.12	0.54	0.588	
Very very inadequate	-4.39	1.23	59	-4.41	0.70	59	0.02	0.11	0.914	
Fully inadequate	-4.56	0.68	59	-4.22	1.57	59	0.34	1.53	0.131	
Exceptionally inadequate	-4.61	0.53	59	-4.56	0.65	59	0.05	0.46	0.648	
Entirely inadequate	-4.63	1.11	59	-4.76	0.50	59	0.14	0.82	0.415	
Wholly inadequate	-4.63	0.58	59	-4.63	0.64	59	0.00	0.00	1.000	
Extremely inadequate	-4.66	0.48	59	-4.61	0.56	59	0.05	0.52	0.604	
Absolutely inadequate	-4.71	1.13	59	-4.75	1.08	59	0.03	0.20	0.845	
Exceptionally inadequate	-4.73	0.45	59	-4.58	0.53	59	0.15	1.66	0.100	
Totally inadequate	-4.81	0.43	59	-4.88	0.33	59	0.07	0.99	0.323	
Completely inadequate	-4.81	0.43	59	-4.66	1.11	59	0.15	0.97	0.336	

*Absolute value of the difference. X: significant <.05

Table AA-2. Comparison of the relative goodness response alternative values for technical staff and managers

Descriptors	Technical Staff			Managers			Diff*	t	t _{PROB}	Sig
	Mean	SD	N	Mean	SD	N				
Best of all	4.93	0.25	59	4.92	0.28	59	0.02	0.20	0.838	
Absolutely best	4.86	0.39	59	4.95	0.22	59	0.08	1.54	0.126	
Undoubtedly best	4.73	0.52	59	4.47	1.39	59	0.25	1.35	0.183	
Truly best	4.73	0.49	59	4.64	0.74	59	0.08	0.78	0.438	
Decidedly best	4.42	0.70	59	4.47	0.80	59	0.05	0.36	0.719	
Best	4.37	0.79	59	4.41	0.87	59	0.03	0.26	0.794	
Extremely better	4.17	0.72	59	3.85	0.89	59	0.32	2.15	0.034	X
Absolutely better	3.92	0.84	59	3.63	1.05	59	0.29	1.66	0.100	
Substantially better	3.14	0.75	59	3.32	0.65	59	0.19	1.39	0.166	
Decidedly better	3.14	0.73	59	3.03	0.69	59	0.10	0.84	0.402	
Conspicuously better	2.90	0.98	59	2.53	0.97	59	0.37	2.06	0.042	X
Moderately better	2.17	0.75	59	2.07	0.67	59	0.10	0.76	0.447	
Rather better	1.86	0.78	59	1.78	0.74	59	0.08	0.57	0.569	
Somewhat better	1.69	0.68	59	1.68	0.78	59	0.02	0.07	0.941	
Slightly better	1.19	0.43	59	1.20	0.61	59	0.02	0.10	0.918	
Barely better	0.88	0.42	59	0.85	0.48	59	0.03	0.36	0.719	
Absolutely alike	0.73	1.71	59	1.03	1.98	59	0.31	0.88	0.380	
Alike	0.25	0.99	59	0.20	0.83	59	0.05	0.30	0.767	
The same	0.08	0.65	59	0.17	0.77	59	0.08	0.69	0.494	
Borderline	-0.03	0.56	59	-0.15	0.94	59	0.12	0.84	0.402	
Neutral	-0.05	0.22	59	-0.02	0.13	59	0.03	0.90	0.369	
Marginal	-0.15	0.71	59	-0.10	1.08	59	0.05	0.30	0.767	
Barely worse	-1.10	0.44	59	-1.05	0.29	59	0.05	0.73	0.468	
Slightly worse	-1.24	0.47	59	-1.25	0.48	59	0.02	0.11	0.909	
Somewhat worse	-1.76	0.75	59	-1.64	0.66	59	0.12	0.92	0.358	
Moderately worse	-2.53	0.57	59	-2.44	0.68	59	0.08	0.78	0.438	
Worse	-2.61	0.79	59	-2.37	1.00	59	0.24	1.45	0.151	
Noticeably worse	-2.71	0.77	59	-2.86	0.82	59	0.15	1.02	0.308	
Notably worse	-2.98	0.75	59	-3.05	0.65	59	0.07	0.54	0.589	
Largely worse	-3.37	0.67	59	-3.31	0.77	59	0.07	0.45	0.652	
Decidedly worse	-3.39	0.89	59	-3.39	0.89	59	0.00	0.00	1.000	
Much worse	-3.39	0.72	59	-3.36	0.71	59	0.03	0.23	0.820	
Considerably worse	-3.39	0.67	59	-3.32	0.73	59	0.07	0.54	0.588	
Conspicuously worse	-3.44	0.82	59	-3.19	0.75	59	0.25	1.73	0.087	
Substantially worse	-3.68	0.68	59	-3.63	0.74	59	0.05	0.38	0.703	
Very much worse	-3.88	0.56	59	-3.95	0.71	59	0.07	0.59	0.553	
Decidedly worst	-4.07	1.24	59	-3.95	0.94	59	0.12	0.59	0.555	
Absolutely worse	-4.42	0.75	59	-4.51	1.02	59	0.08	0.55	0.586	
Undoubtedly worst	-4.58	0.72	59	-4.49	0.82	59	0.08	0.63	0.528	
Absolutely worst	-4.86	0.47	59	-4.95	0.22	59	0.08	1.33	0.186	
Worst of all	-4.92	0.28	59	-4.97	0.18	59	0.05	1.15	0.251	

* Absolute value of the difference. X: significant < .05

APPENDIX AB

F_{MAX} values for working age technical staff and managersTable AB-1. F_{MAX} values for working age tech staff and managers for acceptability

Descriptor	SD		F _{MAX}	F _{CRIT} (2.07)
	WA Males	WA Females		
Completely acceptable	0.77	1.48	3.72	X
Very very acceptable	0.71	0.75	1.11	
Fully acceptable	0.92	0.93	1.00	
Wholly acceptable	1.05	1.83	3.05	X
Highly acceptable	0.62	0.51	1.47	
Extremely acceptable	2.43	1.80	1.81	
Most acceptable	1.39	0.84	2.72	X
Quite acceptable	0.74	1.25	2.83	X
Largely acceptable	1.00	2.36	5.52	X
Acceptable	1.16	1.17	1.02	
Pretty acceptable	0.77	0.67	1.35	
Moderately acceptable	0.71	0.90	1.59	
Reasonably acceptable	1.19	0.85	1.98	
Rather acceptable	1.04	0.93	1.23	
Fairly acceptable	1.02	0.77	1.79	
Mildly acceptable	0.56	0.60	1.12	
Somewhat acceptable	1.11	0.75	2.17	X
Mildly acceptable	0.88	0.78	1.28	
Sort of acceptable	0.67	0.62	1.14	
Slightly acceptable	0.43	0.37	1.40	
Barely acceptable	0.94	0.73	1.65	
Neutral	0.22	0.13	2.90	X
Borderline	0.65	0.60	1.18	
Marginal	0.84	1.22	2.12	X
Barely unacceptable	0.44	0.39	1.24	
Slightly unacceptable	0.35	0.44	1.65	
Somewhat unacceptable	0.66	0.74	1.27	
Fairly unacceptable	0.83	0.91	1.19	
Rather unacceptable	0.79	0.74	1.13	
Moderately unacceptable	0.94	0.73	1.62	
Reasonably unacceptable	0.75	0.91	1.47	
Pretty unacceptable	0.79	1.10	1.94	
Unacceptable	0.87	1.09	1.58	
Quite unacceptable	1.00	0.82	1.51	
Notably unacceptable	0.83	0.87	1.09	
Substantially unacceptable	0.56	0.77	1.88	
Largely unacceptable	0.67	0.68	1.03	
Considerably unacceptable	0.58	0.70	1.45	
Decidedly unacceptable	0.80	0.71	1.27	
Highly unacceptable	0.63	1.23	3.80	X
Highly unacceptable	0.59	0.68	1.33	
Most unacceptable	0.79	0.79	1.00	
Wholly unacceptable	1.25	1.25	1.01	
Very very unacceptable	0.60	0.65	1.20	
Exceptionally unacceptable	0.48	0.51	1.13	
Extremely unacceptable	0.41	0.49	1.43	
Completely unacceptable	0.47	0.52	1.20	
Totally unacceptable	0.41	0.22	3.38	X
Entirely unacceptable	0.30	0.48	2.53	X
Absolutely unacceptable	0.22	0.25	1.31	

Table AB-2. F_{MAX} values for working age tech staff and managers for adequacy

Descriptor	SD		F_{MAX}	$F_{CRIT} (2.07)$
	WA Males	WA Females		
Extremely adequate	0.73	0.80	1.22	
Exceptionally adequate	0.79	1.34	2.87	X
Totally adequate	0.86	1.00	1.36	
Entirely adequate	0.91	1.15	1.60	
Absolutely adequate	1.12	1.96	3.08	X
Fully adequate	0.90	1.14	1.61	
Very very adequate	0.88	1.09	1.54	
Perfectly adequate	1.06	1.90	3.20	X
Most adequate	1.06	1.21	1.30	
Highly adequate	0.66	0.79	1.46	
Completely adequate	1.60	1.73	1.17	
Wholly adequate	2.36	1.55	2.34	X
Very adequate	0.70	0.77	1.22	
Decidedly adequate	1.38	1.37	1.01	
Considerably adequate	1.17	0.71	2.68	
Quite adequate	0.83	0.84	1.02	
Substantially adequate	1.42	1.44	1.03	
Largely adequate	1.44	0.71	4.13	X
Reasonably adequate	0.82	0.78	1.09	
Pretty adequate	1.23	0.80	2.38	X
Rather adequate	1.40	1.37	1.04	
Somewhat adequate	0.88	0.91	1.08	
Mildly adequate	0.69	0.65	1.13	
Slightly adequate	0.82	0.59	1.94	
Barely adequate	0.82	0.69	1.40	
Neutral	0.13	0.00	--	
Borderline	0.57	0.97	2.89	X
Barely inadequate	0.26	0.34	1.67	
Slightly inadequate	0.41	0.39	1.08	
Somewhat inadequate	0.93	0.77	1.45	
Mildly inadequate	0.67	0.68	1.04	
Fairly inadequate	1.09	0.97	1.26	
Rather inadequate	0.73	0.97	1.78	
Moderately inadequate	0.56	0.60	1.13	
Pretty inadequate	0.91	0.97	1.13	
Considerably inadequate	1.16	0.82	2.04	
Very inadequate	0.97	0.71	1.87	
Decidedly inadequate	0.85	0.92	1.18	
Highly inadequate	1.61	0.69	5.36	X
Most inadequate	1.20	1.20	1.00	
Very very inadequate	1.23	0.70	3.12	X
Fully inadequate	0.68	1.57	5.36	X
Exceptionally inadequate	0.53	0.65	1.53	
Entirely inadequate	1.11	0.50	4.89	X
Wholly inadequate	0.58	0.64	1.20	
Extremely inadequate	0.48	0.56	1.36	
Absolutely inadequate	1.13	1.08	1.10	
Exceptionally inadequate	0.45	0.53	1.41	
Totally inadequate	0.43	0.33	1.77	
Completely inadequate	0.43	1.11	6.50	X

Table AB-3. F_{MAX} values for working age tech staff and managers for relative goodness

Descriptor	SD		F_{MAX}	$F_{CRIT} (2.07)$
	WA Males	WA Females		
Best of all	0.25	0.28	1.23	
Absolutely best	0.39	0.22	3.13	X
Undoubtedly best	0.52	1.39	7.20	X
Truly best	0.49	0.74	2.31	X
Decidedly best	0.70	0.80	1.29	
Best	0.79	0.87	1.24	
Extremely better	0.72	0.89	1.51	
Absolutely better	0.84	1.05	1.57	
Substantially better	0.75	0.65	1.32	
Decidedly better	0.73	0.69	1.11	
Conspicuously better	0.98	0.97	1.01	
Moderately better	0.75	0.67	1.26	
Rather better	0.78	0.74	1.09	
Somewhat better	0.68	0.78	1.32	
Slightly better	0.43	0.61	1.97	
Barely better	0.42	0.48	1.34	
Absolutely alike	1.71	1.98	1.34	
Alike	0.99	0.83	1.45	
The same	0.65	0.77	1.40	
Borderline	0.56	0.94	2.88	X
Neutral	0.22	0.13	2.90	X
Marginal	0.71	1.08	2.27	X
Barely worse	0.44	0.29	2.35	X
Slightly worse	0.47	0.48	1.04	
Somewhat worse	0.75	0.66	1.28	
Moderately worse	0.57	0.68	1.42	
Worse	0.79	1.00	1.60	
Noticeably worse	0.77	0.82	1.14	
Notably worse	0.75	0.65	1.33	
Largely worse	0.67	0.77	1.34	
Decidedly worse	0.89	0.89	1.00	
Much worse	0.72	0.71	1.02	
Considerably worse	0.67	0.73	1.19	
Conspicuously worse	0.82	0.75	1.17	
Substantially worse	0.68	0.74	1.18	
Very much worse	0.56	0.71	1.59	
Decidedly worst	1.24	0.94	1.76	
Absolutely worse	0.75	1.02	1.87	
Undoubtedly worst	0.72	0.82	1.27	
Absolutely worst	0.47	0.22	4.54	X
Worst of all	0.28	0.18	2.37	X

APPENDIX AC

Bivariate distributions of mean values for working age technical staff and managers

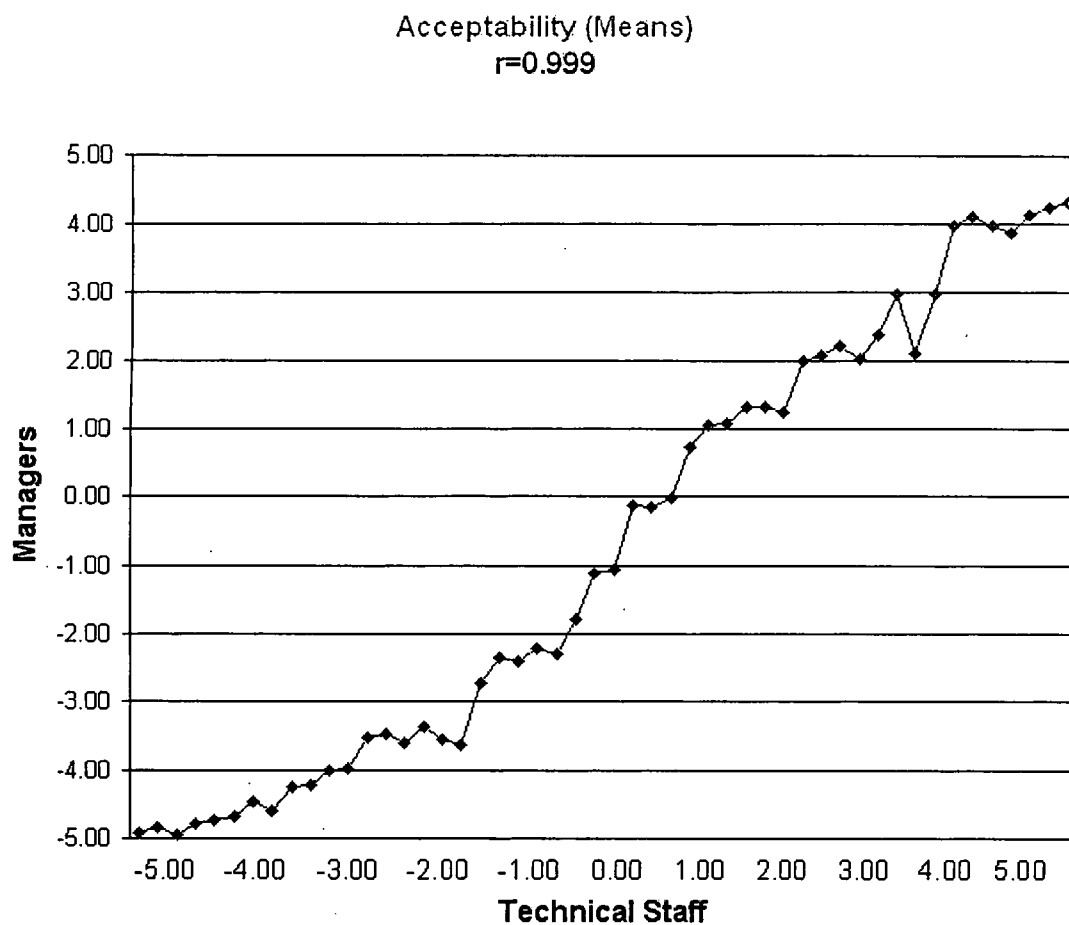


Figure AC-1. Bivariate distribution of mean values for acceptability response alternatives for working age technical staff and managers

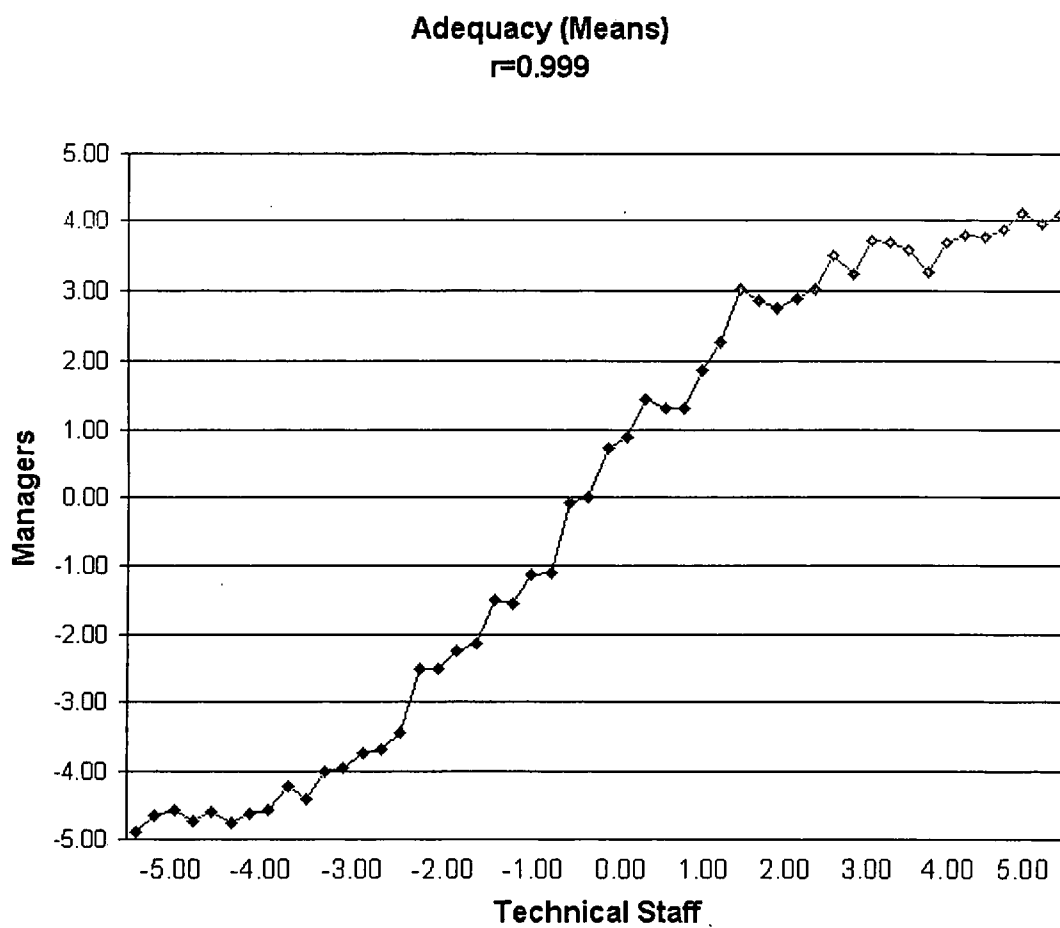
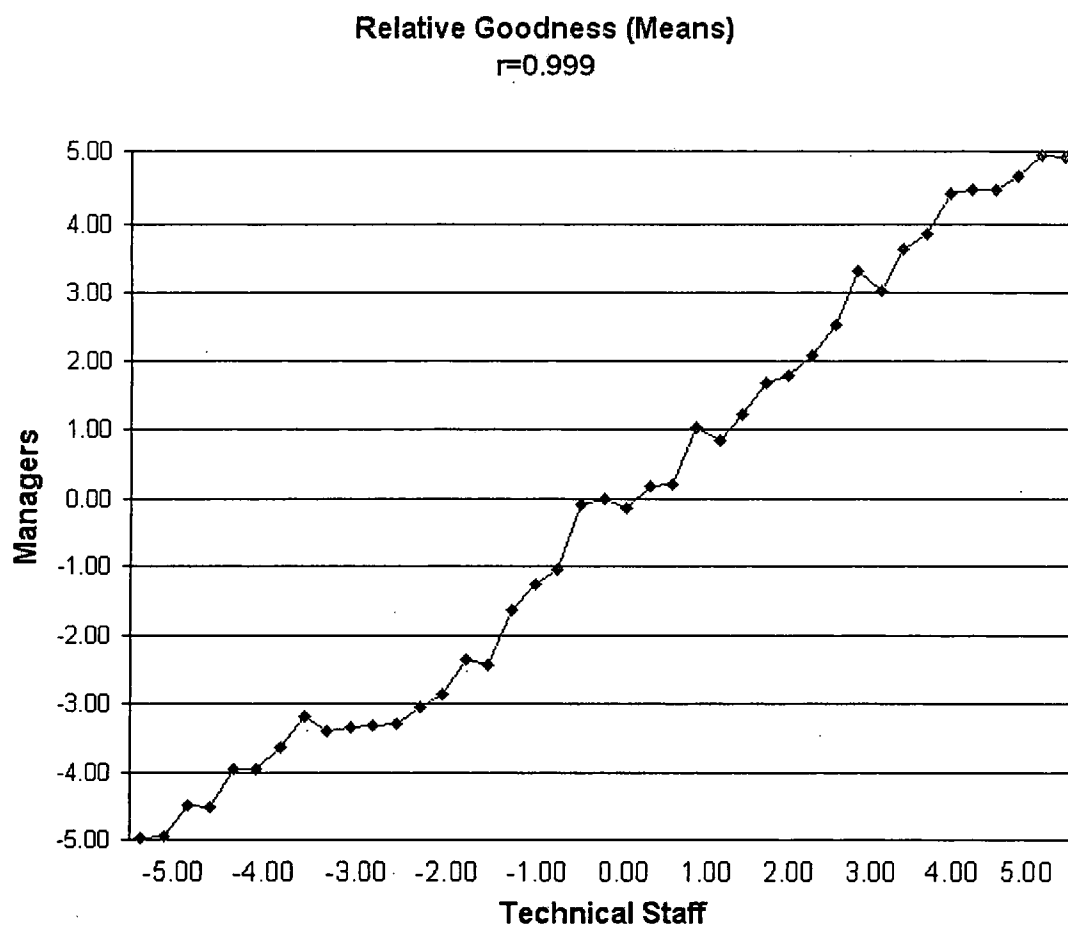


Figure AC-2. Bivariate distribution of mean values for adequacy response alternatives for working age technical staff and managers



FigureAC-3. Bivariate distribution of mean values for relative goodness response alternatives for working age technical staff and managers

APPENDIX AD

ANOVA results for working age personnel segmented by age

Table AD-1. Comparison of the adequacy response alternative values for working age participants segmented by age

Descriptor	23-32		33-42		43-52		53-62		63-72		F*	F _{PROB}	Sig
	M	N	M	N	M	N	M	N	M	N			
Totally adequate	4.32	28	4.57	28	4.32	28	4.36	28	4.64	11	0.67	0.617	
Exceptionally adequate	4.29	28	4.46	28	4.50	28	3.96	28	4.00	11	1.51	0.205	
Extremely adequate	4.25	28	4.04	28	4.11	28	4.25	28	4.55	11	0.32	0.861	
Absolutely adequate	4.18	28	4.36	28	3.71	28	4.25	28	4.27	11	0.76	0.566	
Wholly adequate	4.14	28	3.75	28	3.96	28	4.00	28	2.73	11	2.31	0.062	
Fully adequate	3.93	28	4.18	28	4.00	28	4.07	28	4.00	11	0.25	0.910	
Most adequate	3.89	28	4.00	28	3.68	28	3.79	28	3.73	11	0.39	0.812	
Entirely adequate	3.86	28	4.36	28	4.39	28	4.04	28	4.09	11	1.08	0.369	
Perfectly adequate	3.82	28	3.75	28	3.71	28	3.86	28	3.55	11	0.13	0.972	
Highly adequate	3.82	28	3.93	28	3.82	28	3.71	28	3.91	11	0.34	0.851	
Very very adequate	3.79	28	3.68	28	3.93	28	3.86	28	4.00	11	0.23	0.921	
Completely adequate	3.46	28	4.18	28	3.68	28	4.14	28	4.36	11	1.11	0.354	
Substantially adequate	3.36	28	2.79	28	3.50	28	2.25	28	2.91	11	3.01	0.021	X
Very adequate	3.25	28	3.61	28	3.61	28	3.43	28	3.36	11	0.58	0.675	
Decidedly adequate	3.25	28	3.21	28	3.50	28	3.04	28	3.27	11	0.89	0.473	
Largely adequate	3.11	28	3.00	28	3.11	28	3.07	28	2.09	11	1.91	0.113	
Quite adequate	2.75	28	3.14	28	3.14	28	2.86	28	3.09	11	0.96	0.433	
Considerably adequate	2.68	28	3.14	28	3.04	28	2.86	28	3.36	11	0.91	0.459	
Reasonably adequate	2.54	28	2.46	28	2.25	28	2.36	28	2.82	11	0.99	0.418	
Rather adequate	2.00	28	2.07	28	1.46	28	1.46	28	1.18	11	1.60	0.179	
Pretty adequate	1.93	28	2.29	28	2.14	28	1.75	28	2.36	11	1.33	0.263	
Somewhat adequate	1.71	28	1.61	28	1.32	28	1.43	28	1.55	11	0.82	0.515	
Mildly adequate	1.36	28	1.21	28	1.29	28	1.68	28	1.82	11	2.73	0.033	X
Slightly adequate	1.04	28	0.68	28	0.86	28	0.79	28	0.45	11	1.19	0.320	
Barely adequate	0.54	28	0.68	28	0.61	28	0.64	28	0.55	11	0.13	0.970	
Neutral	0.00	28	0.00	28	-0.04	28	0.00	28	0.00	11	0.84	0.500	
Borderline	-0.04	28	0.04	28	-0.07	28	-0.18	28	0.36	11	1.11	0.358	
Barely inadequate	-0.93	28	-1.11	28	-1.00	28	-1.07	28	-0.91	11	1.48	0.214	
Slightly inadequate	-1.21	28	-1.21	28	-1.21	28	-1.07	28	-1.36	11	1.01	0.405	
Mildly inadequate	-1.64	28	-1.46	28	-1.54	28	-1.32	28	-1.73	11	0.92	0.453	
Somewhat inadequate	-1.68	28	-1.71	28	-1.82	28	-1.46	28	-0.82	11	3.72	0.007	X
Fairly inadequate	-2.18	28	-2.54	28	-2.25	28	-1.79	28	-2.45	11	2.27	0.066	
Pretty inadequate	-2.61	28	-2.25	28	-2.57	28	-2.32	28	-2.64	11	0.49	0.741	
Moderately inadequate	-2.64	28	-2.64	28	-2.61	28	-2.68	28	-2.36	11	0.52	0.720	
Rather inadequate	-2.64	28	-2.54	28	-2.39	28	-2.11	28	-2.55	11	1.74	0.146	
Considerably inadequate	-3.07	28	-3.57	28	-3.46	28	-3.25	28	-3.91	11	1.86	0.122	
Highly inadequate	-3.79	28	-4.36	28	-4.21	28	-3.79	28	-3.91	11	1.28	0.281	
Very inadequate	-3.79	28	-3.89	28	-3.50	28	-3.64	28	-4.00	11	1.01	0.404	
Decidedly inadequate	-3.96	28	-3.54	28	-4.11	28	-3.50	28	-3.73	11	3.13	0.017	X
Most inadequate	-4.14	28	-4.29	28	-4.25	28	-3.89	28	-4.09	11	0.43	0.785	
Fully inadequate	-4.32	28	-4.71	28	-4.43	28	-4.25	28	-4.55	11	0.44	0.781	
Very very inadequate	-4.43	28	-4.14	28	-4.39	28	-4.46	28	-4.45	11	0.43	0.786	
Wholly inadequate	-4.57	28	-4.68	28	-4.75	28	-4.54	28	-4.73	11	0.56	0.692	
Exceptionally inadequate	-4.64	28	-4.68	28	-4.68	28	-4.36	28	-4.45	11	1.37	0.249	
Entirely inadequate	-4.68	28	-4.93	28	-4.89	28	-4.79	28	-4.82	11	1.27	0.288	
Exceptionally inadequate	-4.71	28	-4.79	28	-4.75	28	-4.46	28	-4.55	11	1.97	0.103	
Totally inadequate	-4.82	28	-4.93	28	-4.89	28	-4.93	28	-4.91	11	0.48	0.752	
Extremely inadequate	-4.82	28	-4.82	28	-4.64	28	-4.54	28	-4.36	11	2.78	0.030	X
Absolutely inadequate	-4.82	28	-5.00	28	-4.64	28	-4.50	28	-5.00	11	1.01	0.407	
Completely inadequate	-4.93	28	-4.96	28	-4.93	28	-4.54	28	-4.64	11	1.58	0.183	

*df (2,75)

Table AD-2. Comparison of the relative goodness response alternative values for working age participants segmented by age

Descriptor	23-32		33-42		43-52		53-62		63-72		F*	F _{PROB}	Sig
	M	N	M	N	M	N	M	N	M	N			
Absolutely best	4.96	28	5.00	28	4.96	28	4.82	28	4.82	11	2.57	0.041	X
Undoubtedly best	4.93	28	4.75	28	4.75	28	4.61	28	4.00	11	1.79	0.135	
Truly best	4.86	28	4.79	28	4.61	28	4.75	28	4.64	11	0.81	0.522	
Best of all	4.86	28	4.96	28	4.93	28	4.79	28	4.91	11	1.13	0.344	
Decidedly best	4.50	28	4.32	28	4.54	28	4.39	28	4.55	11	0.40	0.812	
Best	4.46	28	4.71	28	4.50	28	4.32	28	4.36	11	0.82	0.515	
Extremely better	4.25	28	4.29	28	3.61	28	3.89	28	3.91	11	1.86	0.122	
Absolutely better	4.07	28	3.82	28	3.93	28	3.75	28	3.91	11	0.50	0.739	
Substantially better	3.43	28	3.36	28	3.39	28	3.00	28	3.18	11	1.89	0.116	
Decidedly better	3.43	28	2.96	28	3.21	28	3.07	28	3.18	11	1.85	0.124	
Conspicuously better	2.46	28	2.71	28	2.79	28	2.82	28	2.91	11	0.61	0.653	
Moderately better	2.14	28	2.18	28	2.04	28	2.25	28	1.91	11	0.68	0.607	
Rather better	2.14	28	1.57	28	1.96	28	1.68	28	1.82	11	2.10	0.086	
Somewhat better	1.71	28	1.64	28	1.64	28	1.43	28	2.00	11	1.51	0.205	
Slightly better	1.29	28	1.14	28	1.18	28	1.25	28	1.36	11	0.46	0.763	
Barely better	0.89	28	0.89	28	0.82	28	0.86	28	0.82	11	0.13	0.973	
Absolutely alike	0.61	28	0.93	28	1.43	28	1.18	28	2.00	11	1.15	0.335	
Alike	0.07	28	0.07	28	0.46	28	0.11	28	1.09	11	3.57	0.009	X
The same	0.00	28	0.00	28	0.00	28	0.11	28	0.91	11	4.78	0.001	X
Neutral	-0.04	28	0.04	28	-0.04	28	0.00	28	-0.09	11	1.28	0.280	
Borderline	-0.29	28	0.11	28	-0.18	28	-0.14	28	0.55	11	3.02	0.021	X
Marginal	-0.29	28	0.04	28	-0.11	28	-0.07	28	0.36	11	1.38	0.246	
Barely worse	-1.11	28	-1.14	28	-1.00	28	-1.04	28	-1.00	11	0.80	0.528	
Slightly worse	-1.32	28	-1.18	28	-1.18	28	-1.21	28	-1.64	11	2.41	0.053	
Somewhat worse	-1.93	28	-1.68	28	-1.86	28	-1.39	28	-1.55	11	2.38	0.055	
Worse	-2.32	28	-2.64	28	-2.43	28	-2.29	28	-2.64	11	0.71	0.586	
Moderately worse	-2.46	28	-2.43	28	-2.39	28	-2.61	28	-2.55	11	0.49	0.744	
Conspicuously worse	-3.00	28	-3.14	28	-3.32	28	-3.50	28	-3.55	11	1.65	0.166	
Noticeably worse	-3.00	28	-2.57	28	-2.82	28	-2.86	28	-2.45	11	1.74	0.146	
Notably worse	-3.04	28	-2.89	28	-3.11	28	-3.07	28	-3.00	11	0.39	0.813	
Much worse	-3.43	28	-3.39	28	-3.25	28	-3.32	28	-3.73	11	1.09	0.363	
Considerably worse	-3.43	28	-3.43	28	-3.50	28	-3.21	28	-3.73	11	1.12	0.352	
Decidedly worse	-3.61	28	-3.29	28	-3.54	28	-3.32	28	-3.27	11	0.70	0.592	
Largely worse	-3.64	28	-3.21	28	-3.54	28	-2.96	28	-3.18	11	4.82	0.001	X
Substantially worse	-3.75	28	-3.71	28	-3.82	28	-3.36	28	-3.82	11	1.80	0.133	
Very much worse	-4.00	28	-3.79	28	-3.93	28	-3.82	28	-3.82	11	0.52	0.719	
Decidedly worst	-4.36	28	-4.04	28	-4.21	28	-3.54	28	-4.09	11	2.46	0.050	
Absolutely worse	-4.64	28	-4.54	28	-4.68	28	-4.46	28	-4.00	11	1.34	0.261	
Undoubtedly worst	-4.86	28	-4.46	28	-4.68	28	-4.54	28	-4.18	11	2.28	0.064	
Absolutely worst	-4.89	28	-5.00	28	-5.00	28	-4.86	28	-5.00	11	2.39	0.055	
Worst of all	-5.00	28	-4.96	28	-4.61	28	-4.86	28	-5.00	11	0.83	0.508	

* df (2,75)

APPENDIX AF

Levene values for working age personnel segmented by age

Table AF-1. Levene values for working age personnel segmented by age for acceptability

Descriptor	SD					Levene	F _{CRIT} (2,46)
	23-32	33-42	43-52	53-62	63-72		
Extremely acceptable	0.55	2.46	0.69	2.73	3.72	6.31	X
Completely acceptable	0.68	0.79	0.69	1.95	0.93	2.02	
Very very acceptable	0.63	0.77	0.61	0.89	0.67	0.64	
Most acceptable	0.76	0.96	1.72	1.01	0.50	1.25	
Fully acceptable	0.89	1.07	0.83	0.86	1.19	0.53	
Wholly acceptable	0.98	2.01	0.99	2.47	1.19	2.15	
Highly acceptable	0.54	2.14	1.62	0.58	0.70	2.95	X
Quite acceptable	0.67	0.82	1.44	0.97	0.92	0.40	
Largely acceptable	0.69	2.27	2.16	2.06	0.65	2.93	X
Acceptable	0.88	0.96	1.23	1.35	0.83	1.69	
Rather acceptable	0.84	0.99	0.83	0.90	1.48	0.83	
Pretty acceptable	0.84	0.50	0.69	0.75	0.70	1.76	
Reasonably acceptable	1.08	0.83	0.69	0.78	1.29	1.49	
Moderately acceptable	1.20	0.63	0.86	1.18	0.50	0.37	
Fairly acceptable	0.88	1.17	0.63	0.93	1.04	2.11	
Mildly acceptable	0.79	0.86	0.73	0.78	0.98	0.74	
Somewhat acceptable	0.96	1.00	0.87	0.92	0.69	0.94	
Mildly acceptable	0.64	0.48	0.60	0.63	1.04	2.56	X
Slightly acceptable	0.59	0.31	0.33	0.51	0.60	2.27	
Sort of acceptable	0.52	0.51	0.71	0.69	0.40	0.46	
Barely acceptable	0.69	0.61	1.00	0.88	0.30	2.31	
Neutral	0.00	0.00	0.00	0.19	0.00	3.64	X
Borderline	0.57	0.60	0.69	0.65	0.63	0.11	
Marginal	1.06	0.96	0.72	0.76	1.91	3.07	X
Barely unacceptable	0.54	0.71	0.42	0.33	0.83	1.57	
Slightly unacceptable	0.70	0.48	0.36	0.42	0.67	2.65	X
Somewhat unacceptable	0.57	0.75	0.67	0.69	0.81	0.90	
Reasonably unacceptable	1.24	0.74	0.57	1.07	0.93	1.00	
Fairly unacceptable	0.79	0.81	0.55	0.79	0.67	1.30	
Moderately unacceptable	0.69	0.74	0.69	0.79	0.92	0.78	
Pretty unacceptable	0.72	0.79	0.80	1.29	0.69	0.80	
Rather unacceptable	0.83	0.99	0.71	0.83	0.90	1.41	
Unacceptable	0.90	1.28	1.06	1.26	1.14	2.43	
Notably unacceptable	0.72	1.02	0.74	0.83	0.81	1.37	
Considerably unacceptable	0.74	1.55	0.68	0.92	0.79	0.46	
Largely unacceptable	0.63	0.59	0.60	0.68	0.65	1.14	
Quite unacceptable	0.71	1.67	0.67	0.78	0.83	1.81	
Substantially unacceptable	0.61	0.75	0.72	0.74	0.82	0.95	
Decidedly unacceptable	0.88	1.43	0.72	0.94	0.77	2.00	
Highly unacceptable	0.61	0.51	0.55	0.48	1.14	2.22	
Highly unacceptable	0.53	0.58	0.61	1.60	0.77	0.17	
Most unacceptable	0.55	0.79	0.71	0.96	0.65	1.31	
Exceptionally unacceptable	0.46	0.44	0.42	0.50	0.65	1.84	
Very very unacceptable	0.46	0.64	0.69	0.63	0.82	3.10	X
Extremely unacceptable	0.39	0.39	0.42	0.55	0.50	2.63	X
Wholly unacceptable	0.48	1.74	0.36	0.79	0.67	3.43	X
Entirely unacceptable	0.76	0.26	0.19	0.50	0.90	2.73	X
Completely unacceptable	0.26	0.00	0.45	0.60	0.00	11.41	X
Totally unacceptable	0.19	0.19	0.19	0.26	0.30	0.99	
Absolutely unacceptable	0.19	0.00	0.00	0.36	0.00	13.54	X

Table AF-2. Levene values for working age personnel segmented by age for adequacy

Descriptor	SD					Levene	F _{CRIT} (2.46)
	23-32	33-42	43-52	53-62	63-72		
Totally adequate	0.82	0.74	0.90	0.83	0.81	0.91	
Exceptionally adequate	0.85	0.64	0.75	1.53	0.89	0.33	
Extremely adequate	0.84	1.97	1.73	0.70	0.69	0.78	
Absolutely adequate	1.19	0.78	2.61	0.84	1.19	3.11	X
Wholly adequate	0.93	1.76	0.92	0.94	2.65	3.16	X
Fully adequate	0.98	0.90	0.98	1.02	1.18	0.89	
Most adequate	1.03	1.19	0.77	1.03	1.35	0.92	
Entirely adequate	1.65	0.87	0.74	1.10	1.14	1.65	
Perfectly adequate	1.19	0.93	1.98	1.04	1.37	0.70	
Highly adequate	0.61	0.90	0.72	0.60	0.83	0.26	
Very very adequate	1.42	1.56	0.90	0.71	1.10	0.99	
Completely adequate	2.56	1.12	1.93	0.85	1.03	1.69	
Substantially adequate	0.91	1.73	0.69	2.32	0.94	4.53	X
Very adequate	1.73	0.74	0.79	0.63	0.81	0.80	
Decidedly adequate	0.93	1.13	0.79	0.79	1.01	1.22	
Largely adequate	0.88	1.39	0.63	0.86	2.21	2.22	
Quite adequate	1.14	0.89	0.76	0.93	1.14	1.48	
Considerably adequate	1.68	1.58	0.64	0.76	0.67	0.96	
Reasonably adequate	0.74	0.79	1.21	0.68	0.87	0.36	
Rather adequate	1.44	0.72	1.62	1.29	2.09	2.87	X
Pretty adequate	1.30	0.90	0.85	1.04	1.12	0.50	
Somewhat adequate	1.01	0.92	0.77	0.88	0.82	0.32	
Mildly adequate	0.73	0.63	0.85	0.61	0.60	0.58	
Slightly adequate	0.74	1.09	0.71	0.69	1.04	1.59	
Barely adequate	0.92	0.72	0.79	0.83	0.93	0.19	
Neutral	0.00	0.00	0.19	0.00	0.00	3.64	X
Borderline	0.43	0.58	0.60	0.67	1.75	4.55	X
Barely inadequate	0.47	0.31	0.00	0.38	0.30	2.52	X
Slightly inadequate	0.42	0.42	0.42	0.26	0.81	8.03	X
Mildly inadequate	0.68	0.69	0.64	0.90	0.90	0.11	
Somewhat inadequate	0.72	0.60	0.67	0.64	1.60	2.76	X
Fairly inadequate	0.86	0.69	1.04	1.32	0.69	1.16	
Pretty inadequate	1.42	1.40	1.10	1.16	0.81	0.52	
Moderately inadequate	0.68	0.68	0.69	0.48	0.67	0.99	
Rather inadequate	0.83	0.74	0.63	1.07	0.69	0.19	
Considerably inadequate	1.56	0.88	0.58	0.80	0.70	0.74	
Highly inadequate	2.25	0.49	0.63	0.63	0.83	2.23	
Very inadequate	0.79	0.69	1.35	0.68	0.77	1.84	
Decidedly inadequate	0.84	0.92	0.57	0.75	0.90	2.76	X
Most inadequate	1.69	0.76	0.75	1.57	0.83	0.54	
Fully inadequate	1.89	0.60	1.40	1.73	0.69	0.71	
Very very inadequate	0.69	1.80	0.74	0.58	0.69	2.06	
Wholly inadequate	0.69	0.55	0.52	0.74	0.65	2.16	
Exceptionally inadequate	0.68	0.48	0.48	0.73	0.93	2.62	X
Entirely inadequate	0.61	0.26	0.31	0.50	0.60	5.10	X
Exceptionally inadequate	0.46	0.42	0.44	0.64	0.52	5.05	X
Totally inadequate	0.48	0.26	0.31	0.26	0.30	1.98	
Extremely inadequate	0.39	0.39	0.49	0.64	0.67	7.74	X
Absolutely inadequate	0.55	0.00	1.52	1.55	0.00	3.45	X
Completely inadequate	0.26	0.19	0.26	1.53	0.67	4.89	X

Table AF-3. Levene values for working age personnel segmented by age for relative goodness

Descriptor	SD					Levene	F _{CRIT} (2,46)
	23-32	33-42	43-52	53-62	63-72		
Absolutely best	0.19	0.00	0.19	0.39	0.40	12.72	X
Undoubtedly best	0.38	0.59	0.44	0.63	3.00	7.54	X
Truly best	0.36	0.50	0.74	0.44	0.92	3.34	X
Best of all	0.45	0.19	0.26	0.42	0.30	4.56	X
Decidedly best	0.58	0.90	0.69	0.79	0.93	1.44	
Best	0.92	0.46	0.69	1.19	0.81	2.94	X
Extremely better	0.84	0.66	1.62	1.07	0.83	0.49	
Absolutely better	0.77	0.86	0.86	1.08	1.04	2.00	
Substantially better	0.74	0.62	0.63	0.61	0.87	2.26	
Decidedly better	0.79	0.64	0.50	0.77	0.60	1.48	
Conspicuously better	1.04	0.90	1.13	1.02	1.14	0.50	
Moderately better	0.65	0.67	0.84	0.59	0.54	0.36	
Rather better	0.71	1.00	0.88	0.77	0.60	1.01	
Somewhat better	0.81	0.49	0.62	0.50	1.18	1.88	
Slightly better	0.53	0.45	0.39	0.44	1.21	2.44	
Barely better	0.50	0.42	0.48	0.45	0.75	1.10	
Absolutely alike	1.52	1.78	2.15	2.28	3.00	6.62	X
Alike	0.26	0.26	1.23	0.57	2.02	15.69	X
The same	0.00	0.00	0.00	0.57	2.02	26.43	X
Neutral	0.19	0.19	0.19	0.00	0.30	2.18	
Borderline	0.71	0.57	0.55	0.65	1.57	2.80	X
Marginal	0.76	0.64	0.57	0.66	1.80	4.31	X
Barely worse	0.31	0.36	0.38	0.33	0.45	0.57	
Slightly worse	0.55	0.39	0.48	0.42	0.50	1.98	
Somewhat worse	0.86	0.67	0.59	0.79	0.69	1.23	
Worse	0.90	1.03	0.92	1.12	0.50	1.06	
Moderately worse	0.64	0.57	0.83	0.50	0.52	4.01	X
Conspicuously worse	0.98	0.89	0.86	0.79	0.52	0.40	
Noticeably worse	0.77	0.88	0.77	0.59	0.69	2.11	
Notably worse	0.69	0.74	0.42	0.72	1.00	1.91	
Much worse	0.57	0.74	0.59	0.77	0.65	1.62	
Considerably worse	0.63	0.84	0.69	0.74	0.79	0.75	
Decidedly worse	0.92	0.81	0.64	0.94	1.56	3.28	X
Largely worse	0.68	0.57	0.64	0.74	0.60	0.51	
Substantially worse	0.65	0.81	0.61	0.87	0.60	2.18	
Very much worse	0.61	0.79	0.47	0.55	0.87	2.57	X
Decidedly worst	0.83	1.00	0.74	1.53	0.83	1.04	
Absolutely worse	0.49	0.69	0.67	1.04	1.79	3.13	X
Undoubtedly worst	0.45	0.88	0.55	0.74	0.98	5.71	X
Absolutely worst	0.31	0.00	0.00	0.36	0.00	12.93	X
Worst of all	0.00	0.19	1.89	0.36	0.00	3.42	X

APPENDIX AG

ANOVA results for working age personnel segmented by age

Table AG-1. Comparison of the adequacy response alternative values for working age participants segmented by education level

Descriptor	HS & Associates		Bachelors		Graduate		F*	F _{PROB}	Sig
	Mean	N	Mean	N	Mean	N			
Absolutely adequate	4.65	26	3.81	26	4.31	26	4.44	0.015	X
Exceptionally adequate	4.58	26	4.19	26	4.23	26	0.88	0.417	
Totally adequate	4.50	26	4.08	26	4.38	26	1.92	0.153	
Entirely adequate	4.46	26	3.58	26	4.23	26	3.82	0.026	X
Extremely adequate	4.23	26	4.35	26	4.38	26	0.09	0.911	
Fully adequate	4.12	26	3.88	26	4.08	26	0.43	0.651	
Highly adequate	4.08	26	3.42	26	3.88	26	2.02	0.139	
Very very adequate	4.04	26	3.77	26	3.88	26	0.59	0.557	
Completely adequate	3.96	26	3.08	26	4.00	26	1.66	0.198	
Perfectly adequate	3.96	26	3.50	26	3.65	26	1.15	0.321	
Wholly adequate	3.62	26	3.88	26	3.58	26	0.30	0.742	
Very adequate	3.62	26	3.46	26	3.42	26	0.43	0.652	
Most adequate	3.58	26	3.77	26	3.69	26	0.19	0.831	
Largely adequate	3.23	26	2.85	26	2.88	26	0.57	0.566	
Considerably adequate	3.04	26	2.77	26	3.31	26	1.02	0.367	
Substantially adequate	3.00	26	3.31	26	3.27	26	0.51	0.600	
Quite adequate	2.81	26	2.62	26	3.04	26	1.08	0.345	
Decidedly adequate	2.69	26	3.27	26	3.23	26	1.97	0.147	
Pretty adequate	1.81	26	1.81	26	2.23	26	1.13	0.328	
Reasonably adequate	1.81	26	2.31	26	2.54	26	2.96	0.058	
Mildly adequate	1.62	26	1.27	26	1.46	26	1.34	0.268	
Rather adequate	1.54	26	1.85	26	2.08	26	1.46	0.240	
Somewhat adequate	1.42	26	1.35	26	1.65	26	1.25	0.293	
Slightly adequate	0.85	26	0.96	26	0.81	26	0.22	0.802	
Barely adequate	0.73	26	0.54	26	0.50	26	0.51	0.601	
Neutral	0.00	26	0.00	26	0.00	26	--	--	
Borderline	-0.04	26	-0.12	26	-0.04	26	0.21	0.813	
Barely inadequate	-1.08	26	-0.92	26	-1.12	26	2.42	0.096	
Slightly inadequate	-1.12	26	-1.12	26	-1.35	26	2.28	0.109	
Mildly inadequate	-1.27	26	-1.42	26	-1.65	26	1.61	0.206	
Somewhat inadequate	-1.46	26	-1.46	26	-1.42	26	0.01	0.988	
Rather inadequate	-2.15	26	-2.42	26	-2.38	26	1.22	0.301	
Moderately inadequate	-2.19	26	-2.65	26	-2.54	26	3.47	0.036	X
Fairly inadequate	-2.35	26	-2.27	26	-2.35	26	0.06	0.939	
Pretty inadequate	-2.38	26	-2.50	26	-2.62	26	0.31	0.737	
Considerably inadequate	-3.12	26	-3.46	26	-3.62	26	1.54	0.222	
Decidedly inadequate	-3.27	26	-3.73	26	-3.65	26	1.70	0.190	
Very inadequate	-3.77	26	-3.77	26	-3.77	26	0.00	1.000	
Most inadequate	-3.88	26	-3.88	26	-4.23	26	0.76	0.469	
Fully inadequate	-4.08	26	-4.35	26	-4.46	26	0.58	0.565	
Highly inadequate	-4.31	26	-4.19	26	-4.19	26	0.27	0.761	
Wholly inadequate	-4.31	26	-4.54	26	-4.62	26	1.08	0.344	
Exceptionally inadequate	-4.50	26	-4.81	26	-4.38	26	2.69	0.075	
Very very inadequate	-4.50	26	-4.15	26	-4.35	26	0.54	0.583	
Exceptionally inadequate	-4.69	26	-4.62	26	-4.62	26	0.13	0.879	
Entirely inadequate	-4.77	26	-4.69	26	-4.73	26	0.10	0.906	
Totally inadequate	-4.85	26	-4.88	26	-4.81	26	0.12	0.887	
Extremely inadequate	-4.88	26	-4.62	26	-4.54	26	2.55	0.085	
Absolutely inadequate	-4.92	26	-4.81	26	-4.81	26	0.43	0.649	
Completely inadequate	-4.96	26	-4.88	26	-4.85	26	0.45	0.640	

*df (2,75)

Table AG-2. Comparison of the relative goodness response alternative values for working age participants segmented by education level

Descriptor	HS & Associates		Bachelors		Graduate		F*	F _{PROB}	Sig
	Mean	N	Mean	N	Mean	N			
Absolutely best	4.85	26	4.88	26	4.92	26	0.29	0.748	
Best of all	4.73	26	4.92	26	4.96	26	1.66	0.196	
Truly best	4.58	26	4.81	26	4.88	26	2.94	0.059	
Undoubtedly best	4.12	26	4.62	26	4.81	26	3.62	0.032	X
Best	4.08	26	4.27	26	4.65	26	2.13	0.125	
Extremely better	4.08	26	4.35	26	3.81	26	1.34	0.269	
Absolutely better	4.04	26	3.92	26	3.69	26	0.89	0.416	
Decidedly best	3.92	26	4.23	26	4.38	26	1.57	0.215	
Substantially better	3.27	26	3.46	26	3.27	26	0.47	0.624	
Decidedly better	2.92	26	3.15	26	2.96	26	0.65	0.527	
Conspicuously better	2.12	26	2.58	26	2.65	26	1.67	1.673	
Moderately better	2.12	26	2.19	26	2.19	26	0.13	0.875	
Absolutely alike	1.69	26	0.77	26	1.23	26	1.27	0.286	
Rather better	1.69	26	1.96	26	1.77	26	0.80	0.455	
Somewhat better	1.35	26	1.69	26	1.54	26	1.96	0.148	
Slightly better	1.19	26	1.23	26	1.31	26	0.33	0.718	
Barely better	0.88	26	0.92	26	0.92	26	0.04	0.958	
Alike	0.27	26	0.23	26	0.04	26	0.70	0.501	
Neutral	0.04	26	-0.04	26	-0.04	26	1.33	0.270	
The same	0.00	26	0.00	26	0.00	26	--	--	
Borderline	-0.08	26	-0.27	26	-0.04	26	2.14	0.125	
Marginal	-0.08	26	-0.19	26	-0.08	26	0.29	0.748	
Barely worse	-1.00	26	-1.08	26	-1.12	26	0.54	0.586	
Slightly worse	-1.19	26	-1.23	26	-1.35	26	0.76	0.473	
Somewhat worse	-1.54	26	-1.73	26	-1.50	26	0.65	0.527	
Worse	-2.31	26	-2.62	26	-2.54	26	0.64	0.530	
Moderately worse	-2.35	26	-2.50	26	-2.58	26	0.94	0.396	
Noticeably worse	-2.46	26	-2.88	26	-2.58	26	1.68	0.193	
Notably worse	-2.54	26	-3.08	26	-3.19	26	5.61	0.005	X
Conspicuously worse	-2.77	26	-3.19	26	-3.19	26	1.16	0.320	
Decidedly worse	-2.88	26	-3.38	26	-3.12	26	1.92	0.153	
Considerably worse	-3.35	26	-3.46	26	-3.50	26	0.29	0.748	
Decidedly worst	-3.38	26	-4.08	26	-4.19	26	5.03	0.009	X
Much worse	-3.58	26	-3.35	26	-3.31	26	0.99	0.376	
Largely worse	-3.65	26	-3.42	26	-3.23	26	2.04	0.137	
Substantially worse	-3.88	26	-3.65	26	-3.65	26	0.66	0.520	
Very much worse	-4.12	26	-3.69	26	-3.92	26	2.57	0.083	
Undoubtedly worst	-4.27	26	-4.50	26	-4.50	26	0.60	0.554	
Absolutely worse	-4.50	26	-4.35	26	-4.31	26	0.25	0.782	
Worst of all	-4.50	26	-5.00	26	-4.96	26	1.55	0.219	
Absolutely worst	-4.92	26	-4.92	26	-4.81	26	0.63	0.535	

* df (2,75)

APPENDIX AH

Significant pairwise comparisons for working age personnel segmented by education level

Table AH-1. Significant F_{PROB} pairwise comparison values for working age personnel segmented by education level for acceptability

Descriptor	HS & Assoc Bachelors	HS & Assoc Graduate	Bachelors Graduate
Extremely acceptable			
Highly acceptable			
Fully acceptable			
Completely acceptable			
Very very acceptable			
Most acceptable			
Wholly acceptable			
Quite acceptable			
Largely acceptable			
Pretty acceptable			
Moderately acceptable			
Rather acceptable			
Reasonably acceptable			
Acceptable		0.003	
Fairly acceptable			
Mildly acceptable			
Mildly acceptable			
Somewhat acceptable			
Slightly acceptable			
Sort of acceptable			
Barely acceptable			
Neutral			
Borderline			
Marginal			
Barely unacceptable			
Slightly unacceptable			
Somewhat unacceptable			
Fairly unacceptable		0.01	0.043
Rather unacceptable			
Moderately unacceptable			
Reasonably unacceptable			
Notably unacceptable		0	
Unacceptable		0.008	0.022
Pretty unacceptable			
Quite unacceptable	0.029		
Decidedly unacceptable			
Considerably unacceptable			
Largely unacceptable			
Substantially unacceptable			
Most unacceptable			
Highly unacceptable			
Highly unacceptable			
Exceptionally unacceptable			
Very very unacceptable			
Wholly unacceptable			
Completely unacceptable			
Entirely unacceptable			
Totally unacceptable			
Extremely unacceptable			
Absolutely unacceptable			

Table AH-2. Significant F_{PROB} pairwise comparison values for working age personnel segmented by education level for adequacy

Descriptor	HS & Assoc Bachelors	HS & Assoc Graduate	Bachelors Graduate
Absolutely adequate	0.02		
Exceptionally adequate			
Totally adequate			
Entirely adequate	0.028		
Extremely adequate			
Fully adequate			
Highly adequate			
Very very adequate			
Completely adequate			
Perfectly adequate			
Wholly adequate			
Very adequate			
Most adequate			
Largely adequate			
Considerably adequate			
Substantially adequate			
Quite adequate			
Decidedly adequate			
Pretty adequate			
Reasonably adequate			
Mildly adequate			
Rather adequate			
Somewhat adequate			
Slightly adequate			
Barely adequate			
Neutral			
Borderline			
Barely inadequate			
Slightly inadequate			
Mildly inadequate			
Somewhat inadequate			
Rather inadequate			
Moderately inadequate	0.04		
Fairly inadequate			
Pretty inadequate			
Considerably inadequate			
Decidedly inadequate			
Very inadequate			
Most inadequate			
Fully inadequate			
Highly inadequate			
Wholly inadequate			
Exceptionally inadequate			
Very very inadequate			
Exceptionally inadequate			
Entirely inadequate			
Totally inadequate			
Extremely inadequate			
Absolutely inadequate			
Completely inadequate			

Table AH-3. Significant F_{PROB} pairwise comparison values for working age personnel segmented by education level for relative goodness

Descriptor	HS & Assoc Bachelors	HS & Assoc Graduate	Bachelors Graduate
Absolutely best			
Best of all			
Truly best			
Undoubtedly best			
Best			
Extremely better			
Absolutely better			
Decidedly best			
Substantially better			
Decidedly better			
Conspicuously better			
Moderately better			
Absolutely alike			
Rather better			
Somewhat better			
Slightly better			
Barely better			
Alike			
Neutral			
The same			
Borderline			
Marginal			
Barely worse			
Slightly worse			
Somewhat worse			
Worse			
Moderately worse			
Noticeably worse			
Notably worse	0.035	0.007	
Conspicuously worse			
Decidedly worse			
Considerably worse			
Decidedly worst	0.042	0.013	
Much worse			
Largely worse			
Substantially worse			
Very much worse			
Undoubtedly worst			
Absolutely worse			
Worst of all			
Absolutely worst			

APPENDIX AI

Levene values for working age personnel segmented by education level

Table AI-1. Levene values for working age personnel segmented by education level for acceptability

Descriptor	SD			Levene	F _{CRIT} (3.15)
	HS & Assoc	Bachelors	Graduate		
Extremely acceptable	0.51	1.62	1.76	1.56	
Highly acceptable	0.69	0.72	1.68	0.82	
Fully acceptable	0.80	0.96	0.81	0.04	
Completely acceptable	2.03	0.81	0.80	2.36	
Very very acceptable	1.99	0.86	0.85	0.78	
Most acceptable	0.86	1.07	0.98	0.51	
Wholly acceptable	2.04	1.00	0.71	2.75	
Quite acceptable	1.53	0.69	1.48	1.66	
Largely acceptable	2.04	0.89	1.37	1.89	
Pretty acceptable	0.76	0.75	0.75	0.31	
Moderately acceptable	0.63	0.69	0.67	0.19	
Rather acceptable	0.90	0.80	1.56	1.50	
Reasonably acceptable	0.99	0.76	1.06	0.48	
Acceptable	1.22	0.95	1.35	2.50	
Fairly acceptable	0.74	0.82	1.23	0.08	
Mildly acceptable	0.95	0.58	0.95	1.10	
Mildly acceptable	0.65	0.64	0.69	0.02	
Somewhat acceptable	0.78	0.95	1.01	0.31	
Slightly acceptable	0.37	0.40	0.69	0.10	
Sort of acceptable	0.57	0.57	0.69	0.50	
Barely acceptable	0.65	0.37	0.28	5.51	X
Neutral	0.00	0.00	0.39	4.34	X
Borderline	0.20	0.72	0.49	7.05	X
Marginal	0.39	0.71	0.71	3.06	
Barely unacceptable	1.13	0.33	0.91	2.05	
Slightly unacceptable	0.39	0.71	0.83	2.16	
Somewhat unacceptable	0.81	0.58	1.06	3.28	X
Fairly unacceptable	0.66	0.80	0.85	1.12	
Rather unacceptable	0.98	1.02	0.81	0.86	
Moderately unacceptable	0.90	1.14	1.26	0.04	
Reasonably unacceptable	0.86	0.81	1.27	0.68	
Notably unacceptable	0.88	0.76	0.75	1.24	
Unacceptable	1.59	0.91	1.07	8.48	X
Pretty unacceptable	0.86	0.81	0.96	0.41	
Quite unacceptable	0.86	0.75	0.74	0.41	
Decidedly unacceptable	1.48	1.03	0.63	5.64	X
Considerably unacceptable	0.90	0.90	0.78	0.86	
Largely unacceptable	0.69	0.74	0.72	0.04	
Substantially unacceptable	0.92	0.75	0.63	3.28	X
Most unacceptable	1.00	0.94	0.80	0.29	
Highly unacceptable	0.56	0.64	0.58	0.52	
Highly unacceptable	0.51	0.50	0.67	1.03	
Exceptionally unacceptable	0.81	0.47	0.40	7.69	X
Very very unacceptable	0.65	0.58	0.64	0.20	
Wholly unacceptable	0.81	0.70	0.51	2.57	
Completely unacceptable	0.46	0.43	0.43	0.22	
Entirely unacceptable	0.43	0.27	0.20	1.68	
Totally unacceptable	0.20	0.33	0.20	3.43	X
Extremely unacceptable	0.20	0.51	0.40	9.06	X
Absolutely unacceptable	0.00	0.20	0.27	4.59	X

Table AI-2. Levene values for working age personnel segmented by education level for adequacy

Descriptor	SD			Levene	F _{CRIT} (3,15)
	HS & Assoc	Bachelors	Graduate		
Absolutely adequate	0.63	1.36	0.97	4.84	X
Exceptionally adequate	0.58	1.67	0.91	2.15	
Totally adequate	0.71	0.84	0.85	0.32	
Entirely adequate	0.81	1.68	0.91	2.50	
Extremely adequate	2.05	0.75	0.80	1.78	
Fully adequate	0.95	0.99	0.93	0.98	
Highly adequate	0.56	1.90	0.65	4.17	X
Very very adequate	0.82	0.91	0.95	0.67	
Completely adequate	2.09	2.61	1.30	0.96	
Perfectly adequate	0.96	1.17	1.20	1.03	
Wholly adequate	1.60	1.03	1.92	1.05	
Very adequate	0.80	0.65	0.90	1.85	
Most adequate	1.03	1.14	1.26	0.49	
Largely adequate	1.45	1.54	1.28	0.02	
Considerably adequate	1.59	1.56	0.79	0.19	
Substantially adequate	1.60	0.93	0.92	0.02	
Quite adequate	1.13	1.06	0.92	1.60	
Decidedly adequate	1.49	0.92	1.03	0.54	
Pretty adequate	1.27	1.33	0.86	0.44	
Reasonably adequate	1.58	0.74	0.81	0.99	
Mildly adequate	0.64	0.67	0.95	0.72	
Rather adequate	0.99	1.43	0.93	0.18	
Somewhat adequate	0.50	0.89	0.75	1.26	
Slightly adequate	0.73	0.60	1.17	1.58	
Barely adequate	0.67	0.95	0.99	1.59	
Neutral	0.00	0.00	0.00	na	
Borderline	0.20	0.59	0.60	3.23	X
Barely inadequate	0.27	0.39	0.33	0.37	
Slightly inadequate	0.43	0.33	0.56	6.85	X
Mildly inadequate	1.08	0.58	0.56	0.71	
Somewhat inadequate	0.58	1.17	1.24	1.52	
Rather inadequate	0.54	0.86	0.57	6.40	X
Moderately inadequate	0.80	0.63	0.51	3.04	
Fairly inadequate	0.80	0.92	0.98	0.57	
Pretty inadequate	0.90	1.39	0.80	0.87	
Considerably inadequate	1.48	0.76	0.75	0.62	
Decidedly inadequate	0.96	0.87	1.06	0.31	
Very inadequate	0.95	0.65	0.76	0.83	
Most inadequate	0.82	1.63	0.86	1.00	
Fully inadequate	1.98	0.94	0.71	1.02	
Highly inadequate	0.68	0.49	0.75	2.40	
Wholly inadequate	0.93	0.65	0.75	2.74	
Exceptionally inadequate	0.76	0.49	0.75	4.46	X
Very very inadequate	0.71	1.78	0.80	0.77	
Exceptionally inadequate	0.62	0.57	0.70	0.17	
Entirely inadequate	0.59	0.55	0.72	0.17	
Totally inadequate	0.61	0.43	0.63	0.45	
Extremely inadequate	0.33	0.57	0.76	10.34	X
Absolutely inadequate	0.39	0.49	0.63	1.64	
Completely inadequate	0.20	0.43	0.61	1.92	

Table AI-3. Levene values for working age personnel segmented by education level for relative goodness

Descriptor	SD			Levene	F _{CRIT} (3.15)
	HS & Assoc	Bachelors	Graduate		
Absolutely best	0.46	0.33	0.27	1.30	
Best of all	0.72	0.39	0.20	6.76	X
Truly best	0.64	0.40	0.33	11.38	X
Undoubtedly best	1.42	0.70	0.49	5.71	X
Best	1.35	1.00	0.56	4.21	X
Extremely better	1.81	0.56	0.80	1.41	
Absolutely better	0.92	0.84	1.09	1.86	
Decidedly best	1.13	0.86	0.85	0.79	
Substantially better	0.87	0.86	0.72	0.98	
Decidedly better	0.84	0.73	0.77	0.47	
Conspicuously better	1.14	1.06	1.23	0.34	
Moderately better	0.65	0.49	0.69	1.53	
Absolutely alike	2.15	1.73	2.34	3.23	X
Rather better	0.68	0.77	0.91	2.08	
Somewhat better	0.56	0.74	0.58	0.75	
Slightly better	0.49	0.51	0.55	0.50	
Barely better	0.71	0.48	0.39	0.79	
Alike	0.83	0.99	0.20	2.71	
Neutral	0.20	0.20	0.20	0.00	
The same	0.00	0.00	0.00	na	
Borderline	0.27	0.45	0.53	3.97	X
Marginal	0.27	0.80	0.69	5.74	X
Barely worse	0.49	0.39	0.33	0.21	
Slightly worse	0.49	0.43	0.49	1.67	
Somewhat worse	0.71	0.83	0.81	0.13	
Worse	1.19	0.98	0.86	1.37	
Moderately worse	0.80	0.51	0.50	5.67	X
Noticeably worse	0.86	0.71	0.99	2.09	
Notably worse	0.86	0.74	0.63	2.56	
Conspicuously worse	1.53	0.85	0.98	0.75	
Decidedly worse	0.99	0.90	0.86	0.54	
Considerably worse	0.89	0.71	0.65	1.20	
Decidedly worst	1.17	0.98	0.80	1.62	
Much worse	0.81	0.63	0.79	1.05	
Largely worse	0.63	0.81	0.82	0.72	
Substantially worse	1.07	0.75	0.63	1.70	
Very much worse	0.59	0.84	0.56	2.66	
Undoubtedly worst	1.00	0.81	0.81	1.34	
Absolutely worse	0.76	0.94	1.35	0.94	
Worst of all	1.96	0.00	0.20	5.44	X
Absolutely worst	0.27	0.27	0.63	2.64	

APPENDIX AJ

Response alternatives for working age personnel scale generation

Table AJ-1. Adequacy response alternatives for working age personnel scale generation

Response Alternative	Mean	SD
Extremely adequate	4.28	0.87
Highly adequate	3.79	0.78
Very very adequate	3.76	0.98
Very adequate	3.36	0.83
Decidedly adequate	3.22	0.99
Substantially adequate	3.17	0.90
Largely adequate	3.10	0.88
Considerably adequate	3.05	0.84
Quite adequate	2.87	0.98
Reasonably adequate	2.31	0.81
Pretty adequate	2.05	0.86
Rather adequate	1.93	0.90
Somewhat adequate	1.55	0.70
Mildly adequate	1.44	0.62
Slightly adequate	1.09	0.47
Barely adequate	0.93	0.49
Neutral	-0.02	0.15
Borderline	-0.14	0.66
Barely inadequate	-1.07	0.35
Slightly inadequate	-1.27	0.53
Mildly inadequate	-1.56	0.70
Somewhat inadequate	-1.68	0.67
Fairly inadequate	-2.31	0.76
Rather inadequate	-2.48	0.77
Moderately inadequate	-2.53	0.65
Pretty inadequate	-2.61	0.81
Considerably inadequate	-3.51	0.77
Decidedly inadequate	-3.64	0.92
Very inadequate	-3.77	0.76
Most inadequate	-4.07	0.91
Highly inadequate	-4.15	0.65
Very very inadequate	-4.44	0.68
Fully inadequate	-4.46	0.76
Wholly inadequate	-4.58	0.72
Exceptionally inadequate	-4.61	0.61
Extremely inadequate	-4.69	0.53
Entirely inadequate	-4.72	0.56
Completely inadequate	-4.80	0.50
Totally inadequate	-4.80	0.50
Absolutely inadequate	-4.82	0.51

Table AJ-2. Relative goodness response alternatives for working age personnel scale generation

Response Alternative	Mean	SD
Absolutely best	4.87	0.42
Best of all	4.86	0.42
Truly best	4.64	0.72
Undoubtedly best	4.58	0.78
Decidedly best	4.33	0.83
Best	4.30	0.99
Extremely better	4.05	0.87
Absolutely better	3.82	0.97
Substantially better	3.21	0.68
Decidedly better	3.09	0.76
Moderately better	2.07	0.68
Rather better	1.87	0.76
Somewhat better	1.64	0.69
Slightly better	1.23	0.51
Barely better	0.94	0.40
Alike	0.29	0.89
The same	0.05	0.57
Neutral	-0.03	0.25
Borderline	-0.15	0.64
Marginal	-0.21	0.83
Barely worse	-1.12	0.45
Slightly worse	-1.30	0.55
Somewhat worse	-1.75	0.72
Moderately worse	-2.48	0.65
Noticeably worse	-2.75	0.78
Notably worse	-2.97	0.79
Conspicuously worse	-3.25	0.90
Decidedly worse	-3.35	0.90
Largely worse	-3.36	0.75
Considerably worse	-3.40	0.71
Much worse	-3.46	0.73
Substantially worse	-3.64	0.74
Very much worse	-3.90	0.71
Decidedly worst	-4.01	0.96
Absolutely worse	-4.46	0.86
Undoubtedly worst	-4.50	0.82
Absolutely worst	-4.90	0.36
Worst of all	-4.93	0.27

APPENDIX AK

Acceptability, adequacy, and relative goodness scales generated with the Balanced Numeric Values method

Table AK-1. Five-point acceptability scale developed using the Balanced Numeric Values method

Response Alternative	Mean	SD
Extremely acceptable	4.48	0.71
Reasonably acceptable	2.26	0.82
Neutral	-0.02	0.21
Fairly unacceptable	-2.31	0.80
Very very unacceptable	-4.51	0.64

Table AK-2. Six-point acceptability scale developed using the Balanced Numeric Values method

Response Alternative	Mean	SD
Extremely acceptable	4.48	0.71
Pretty acceptable	2.36	0.78
Barely acceptable	1.04	0.52
Slightly unacceptable	-1.20	0.51
Pretty unacceptable	-2.75	0.83
Wholly unacceptable	-4.66	0.64

Table AK-3. Seven-point acceptability scale developed using the Balanced Numeric Values method

Response Alternative	Mean	SD
Extremely acceptable	4.48	0.71
Largely acceptable	3.09	0.83
Mildly acceptable	1.43	0.67
Neutral	-0.02	0.21
Somewhat unacceptable	-1.78	0.76
Notably unacceptable	-3.27	0.92
Wholly unacceptable	-4.66	0.64

Table AK-4. Eight-point acceptability scale developed using the Balanced Numeric Values method

Response Alternative	Mean	SD
Extremely acceptable	4.48	0.71
Quite acceptable	3.12	0.84
Fairly acceptable	1.99	0.80
Barely acceptable	1.04	0.52
Slightly unacceptable	-1.20	0.51
Fairly unacceptable	-2.31	0.80
Notably unacceptable	-3.27	0.92
Wholly unacceptable	-4.66	0.64

Table AK-5. Nine-point acceptability scale developed using the Balanced Numeric Values method

Response Alternative	Mean	SD
Extremely acceptable	4.48	0.71
Quite acceptable	3.12	0.84
Moderately acceptable	2.25	0.71
Barely acceptable	1.04	0.52
Neutral	-0.02	0.21
Slightly unacceptable	-1.20	0.51
Moderately unacceptable	-2.41	0.77
Quite unacceptable	-3.50	0.82
Wholly unacceptable	-4.66	0.64

Table AK-6. Eleven-point acceptability scale developed using the Balanced Numeric Values method

Response Alternative	Mean	SD
Extremely acceptable	4.48	0.71
Highly acceptable	4.03	0.64
Pretty acceptable	2.36	0.78
Somewhat acceptable	1.48	0.69
Barely acceptable	1.04	0.52
Neutral	-0.02	0.21
Slightly unacceptable	-1.20	0.51
Somewhat unacceptable	-1.78	0.76
Pretty unacceptable	-2.75	0.83
Substantially unacceptable	-3.66	0.76
Wholly unacceptable	-4.66	0.64

Table AK-7. Five-point adequacy scale developed using the Balanced Numeric Values method

Response Alternative	Mean	SD
Extremely adequate	4.28	0.87
Pretty adequate	2.05	0.86
Neutral	-0.02	0.15
Fairly inadequate	-2.31	0.76
Very very inadequate	-4.44	0.68

Table AK-8. Six-point adequacy scale developed using the Balanced Numeric Values method

Response Alternative	Mean	SD
Extremely adequate	4.28	0.87
Quite adequate	2.87	0.98
Barely adequate	0.93	0.49
Barely inadequate	-1.07	0.35
Rather inadequate	-2.48	0.77
Highly inadequate	-4.15	0.65

Table AK-9. Seven-point adequacy scale developed using the Balanced Numeric Values method

Response Alternative	Mean	SD
Extremely adequate	4.28	0.87
Quite adequate	2.87	0.98
Mildly adequate	1.44	0.62
Neutral	-0.02	0.15
Slightly inadequate	-1.27	0.53
Pretty inadequate	-2.61	0.81
Highly inadequate	-4.15	0.65

Table AK-10. Eight-point adequacy scale developed using the Balanced Numeric Values method

Response Alternative	Mean	SD
Extremely adequate	4.28	0.87
Largely adequate	3.10	0.88
Rather adequate	1.93	0.90
Barely adequate	0.93	0.49
Barely inadequate	-1.07	0.35
Somewhat inadequate	-1.68	0.67
Pretty inadequate	-2.61	0.81
Highly inadequate	-4.15	0.65

Table AK-11. Nine-point adequacy scale developed using the Balanced Numeric Values method

Response Alternative	Mean	SD
Extremely adequate	4.28	0.87
Decidedly adequate	3.22	0.99
Reasonably adequate	2.31	0.81
Slightly adequate	1.09	0.47
Neutral	-0.02	0.15
Barely inadequate	-1.07	0.35
Fairly inadequate	-2.31	0.76
Considerably inadequate	-3.51	0.77
Highly inadequate	-4.15	0.65

Table AK-12. Eleven-point adequacy scale developed using the Balanced Numeric Values method

Response Alternative	Mean	SD
Extremely adequate	4.28	0.87
Very adequate	3.36	0.83
Quite adequate	2.87	0.98
Rather adequate	1.93	0.90
Barely adequate	0.93	0.49
Neutral	-0.02	0.15
Barely inadequate	-1.07	0.35
Somewhat inadequate	-1.68	0.67
Rather inadequate	-2.48	0.77
Considerably inadequate	-3.51	0.77
Highly inadequate	-4.15	0.65

Table AK-13. Five-point relative goodness scale developed using the Balanced Numeric Values method

Response Alternative	Mean	SD
Absolutely best	4.87	0.42
Moderately better	2.07	0.68
Neutral	-0.03	0.25
Moderately worse	-2.48	0.65
Absolutely worst	-4.90	0.36

Table AK-14. Six-point relative goodness scale developed using the Balanced Numeric Values method

Response Alternative	Mean	SD
Absolutely best	4.87	0.42
Decidedly better	3.09	0.76
Barely better	0.94	0.40
Barely worse	-1.12	0.45
Notably worse	-2.97	0.79
Absolutely worst	-4.90	0.36

Table AK-15. Seven-point relative goodness scale developed using the Balanced Numeric Values method

Response Alternative	Mean	SD
Absolutely best	4.87	0.42
Substantially better	3.21	0.68
Somewhat better	1.64	0.69
Neutral	-0.03	0.25
Somewhat worse	-1.75	0.72
Conspicuously worse	-3.25	0.90
Absolutely worst	-4.90	0.36

Table AK-16. Eight-point relative goodness scale developed using the Balanced Numeric Values method

Response Alternative	Mean	SD
Absolutely best	4.87	0.42
Substantially better	3.21	0.68
Moderately better	2.07	0.68
Barely better	0.94	0.40
Barely worse	-1.12	0.45
Somewhat worse	-1.75	0.72
Much worse	-3.46	0.73
Absolutely worst	-4.90	0.36

Table AK-17. Nine-point relative goodness scale developed using the Balanced Numeric Values method

Response Alternative	Mean	SD
Absolutely best	4.87	0.42
Absolutely better	3.82	0.97
Moderately better	2.07	0.68
Slightly better	1.23	0.51
Neutral	-0.03	0.25
Slightly worse	-1.30	0.55
Moderately worse	-2.48	0.65
Substantially worse	-3.64	0.74
Absolutely worst	-4.90	0.36

Table AK-18. Eleven-point relative goodness scale developed using the Balanced Numeric Values method

Response Alternative	Mean	SD
Absolutely best	4.87	0.42
Absolutely better	3.82	0.97
Decidedly better	3.09	0.76
Rather better	1.87	0.76
Barely better	0.94	0.40
Neutral	-0.03	0.25
Barely worse	-1.12	0.45
Somewhat worse	-1.75	0.72
Notably worse	-2.97	0.79
Very much worse	-3.90	0.71
Absolutely worst	-4.90	0.36

APPENDIX AL

Response alternatives for working age personnel scale generation using the Balanced Terms method

Table AL-1. Adequacy response alternatives for working age personnel scale generation using the Balanced Terms method

Response Alternative	Mean	SD
Extremely adequate	4.28	0.87
Extremely inadequate	-4.69	0.53
Highly adequate	3.79	0.78
Highly inadequate	-4.15	0.65
Very adequate	3.36	0.83
Very inadequate	-3.77	0.76
Decidedly adequate	3.22	0.99
Decidedly inadequate	-3.64	0.92
Considerably adequate	3.05	0.84
Considerably inadequate	-3.51	0.77
Somewhat adequate	1.55	0.70
Somewhat inadequate	-1.68	0.67
Mildly adequate	1.44	0.62
Mildly inadequate	-1.56	0.70
Slightly adequate	1.09	0.47
Slightly inadequate	-1.27	0.53
Barely adequate	0.93	0.49
Barely inadequate	-1.07	0.35
Neutral	-0.02	0.15
Borderline	-0.14	0.66

Table AL-2. Relative goodness response alternatives for working age personnel scale generation using the Balanced Terms method

Response Alternative	Mean	SD
Absolutely best	4.87	0.42
Absolutely worst	-4.90	0.36
Best of all	4.86	0.42
Worst of all	-4.93	0.27
Undoubtedly best	4.58	0.78
Undoubtedly worst	-4.50	0.82
Decidedly best	4.33	0.83
Decidedly worst	-4.01	0.96
Substantially better	3.21	0.68
Substantially worse	-3.64	0.74
Decidedly better	3.09	0.76
Decidedly worse	-3.35	0.90
Moderately better	2.07	0.68
Moderately worse	-2.48	0.65
Somewhat better	1.64	0.69
Somewhat worse	-1.75	0.72
Slightly better	1.23	0.51
Slightly worse	-1.30	0.55
Barely better	0.94	0.40
Barely worse	-1.12	0.45
Alike	0.29	0.89
The same	0.05	0.57
Neutral	-0.03	0.25
Borderline	-0.15	0.64
Marginal	-0.21	0.83

APPENDIX AM

Acceptability, adequacy, and relative goodness scales generated with the Balanced Terms method

Table AM-1. Five-point acceptability scale developed using the Balanced Terms method

Response Alternative	Mean	SD
Extremely acceptable	4.48	0.71
Moderately acceptable	2.25	0.71
Neutral	-0.02	0.21
Moderately unacceptable	-2.41	0.77
Extremely unacceptable	-4.80	0.42

Table AM-2. Six-point acceptability scale developed using the Balanced Terms method

Response Alternative	Mean	SD
Extremely acceptable	4.48	0.71
Pretty acceptable	2.36	0.78
Barely acceptable	1.04	0.52
Barely unacceptable	-1.21	0.66
Pretty unacceptable	-2.75	0.83
Extremely unacceptable	-4.80	0.42

Table AM-3. Seven-point acceptability scale developed using the Balanced Terms method

Response Alternative	Mean	SD
Extremely acceptable	4.48	0.71
Quite acceptable	3.12	0.84
Somewhat acceptable	1.48	0.69
Neutral	-0.02	0.21
Somewhat unacceptable	-1.78	0.76
Quite unacceptable	-3.50	0.82
Extremely unacceptable	-4.80	0.42

Table AM-4. Eight-point acceptability scale developed using the Balanced Terms method

Response Alternative	Mean	SD
Extremely acceptable	4.48	0.71
Quite acceptable	3.12	0.84
Fairly acceptable	1.99	0.80
Barely acceptable	1.04	0.52
Barely unacceptable	-1.21	0.66
Fairly unacceptable	-2.31	0.80
Quite unacceptable	-3.50	0.82
Extremely unacceptable	-4.80	0.42

Table AM-5. Nine-point acceptability scale developed using the Balanced Terms method

Response Alternative	Mean	SD
Extremely acceptable	4.48	0.71
Quite acceptable	3.12	0.84
Moderately acceptable	2.25	0.71
Barely acceptable	1.04	0.52
Neutral	-0.02	0.21
Barely unacceptable	-1.21	0.66
Moderately unacceptable	-2.41	0.77
Quite unacceptable	-3.50	0.82
Extremely unacceptable	-4.80	0.42

Table AM-6. Eleven-point acceptability scale developed using the Balanced Terms method

Response Alternative	Mean	SD
Extremely acceptable	4.48	0.71
Quite acceptable	3.12	0.84
Pretty acceptable	2.36	0.78
Somewhat acceptable	1.48	0.69
Barely acceptable	1.04	0.52
Neutral	-0.02	0.21
Barely unacceptable	-1.21	0.66
Somewhat unacceptable	-1.78	0.76
Pretty unacceptable	-2.75	0.83
Quite unacceptable	-3.50	0.82
Extremely unacceptable	-4.80	0.42

Table AM-7. Five-point adequacy scale developed using the Balanced Terms method

Response Alternative	Mean	SD
Extremely adequate	4.28	0.87
Somewhat adequate	1.55	0.70
Neutral	-0.02	0.15
Somewhat inadequate	-1.68	0.67
Extremely inadequate	-4.69	0.53

Table AM-8. Six-point adequacy scale developed using the Balanced Terms method

Response Alternative	Mean	SD
Extremely adequate	4.28	0.87
Considerably adequate	3.05	0.84
Barely adequate	0.93	0.49
Barely inadequate	-1.07	0.35
Considerably inadequate	-3.51	0.77
Extremely inadequate	-4.69	0.53

Table AM-9. Seven-point adequacy scale developed using the Balanced Terms method

Response Alternative	Mean	SD
Extremely adequate	4.28	0.87
Considerably adequate	3.05	0.84
Slightly adequate	1.09	0.47
Neutral	-0.02	0.15
Slightly inadequate	-1.27	0.53
Considerably inadequate	-3.51	0.77
Extremely inadequate	-4.69	0.53

Table AM-10. Eight-point adequacy scale developed using the Balanced Terms method

Response Alternative	Mean	SD
Extremely adequate	4.28	0.87
Considerably adequate	3.05	0.84
Somewhat adequate	1.55	0.70
Barely adequate	0.93	0.49
Barely inadequate	-1.07	0.35
Somewhat inadequate	-1.68	0.67
Considerably inadequate	-3.51	0.77
Extremely inadequate	-4.69	0.53

Table AM-11. Nine-point adequacy scale developed using the Balanced Terms method

Response Alternative	Mean	SD
Extremely adequate	4.28	0.87
Decidedly adequate	3.22	0.99
Somewhat adequate	1.55	0.70
Barely adequate	0.93	0.49
Neutral	-0.02	0.15
Barely inadequate	-1.07	0.35
Somewhat inadequate	-1.68	0.67
Decidedly inadequate	-3.64	0.92
Extremely inadequate	-4.69	0.53

Table AM-12. Eleven-point adequacy scale developed using the Balanced Terms method

Response Alternative	Mean	SD
Extremely adequate	4.28	0.87
Very adequate	3.36	0.83
Considerably adequate	3.05	0.84
Somewhat adequate	1.55	0.70
Barely adequate	0.93	0.49
Neutral	-0.02	0.15
Barely inadequate	-1.07	0.35
Somewhat inadequate	-1.68	0.67
Considerably inadequate	-3.51	0.77
Very inadequate	-3.77	0.76
Extremely inadequate	-4.69	0.53

Table AM-13. Five-point relative goodness scale developed using the Balanced Terms method

Response Alternative	Mean	SD
Absolutely best	4.87	0.42
Moderately better	2.07	0.68
Neutral	-0.03	0.25
Moderately worse	-2.48	0.65
Absolutely worst	-4.90	0.36

Table AM-14. Six-point relative goodness scale developed using the Balanced Terms method

Response Alternative	Mean	SD
Absolutely best	4.87	0.42
Decidedly better	3.09	0.76
Barely better	0.94	0.40
Barely worse	-1.12	0.45
Decidedly worse	-3.35	0.90
Absolutely worst	-4.90	0.36

Table AM-15. Seven-point relative goodness scale developed using the Balanced Terms method

Response Alternative	Mean	SD
Absolutely best	4.87	0.42
Substantially better	3.21	0.68
Somewhat better	1.64	0.69
Neutral	-0.03	0.25
Somewhat worse	-1.75	0.72
Substantially worse	-3.64	0.74
Absolutely worst	-4.90	0.36

Table AM-16. Eight-point relative goodness scale developed using the Balanced Terms method

Response Alternative	Mean	SD
Absolutely best	4.87	0.42
Substantially better	3.21	0.68
Moderately better	2.07	0.68
Barely better	0.94	0.40
Barely worse	-1.12	0.45
Moderately worse	-2.48	0.65
Substantially worse	-3.64	0.74
Absolutely worst	-4.90	0.36

Table AM-17. Nine-point relative goodness scale developed using the Balanced Terms method

Response Alternative	Mean	SD
Absolutely best	4.87	0.42
Substantially better	3.21	0.68
Moderately better	2.07	0.68
Slightly better	1.23	0.51
Neutral	-0.03	0.25
Slightly worse	-1.30	0.55
Moderately worse	-2.48	0.65
Substantially worse	-3.64	0.74
Absolutely worst	-4.90	0.36

Table AM-18. Eleven-point relative goodness scale developed using the Balanced Terms method

Response Alternative	Mean	SD
Absolutely best	4.87	0.42
Decidedly best	4.33	0.83
Decidedly better	3.09	0.76
Moderately better	2.07	0.68
Barely better	0.94	0.40
Neutral	-0.03	0.25
Barely worse	-1.12	0.45
Moderately worse	-2.48	0.65
Decidedly worse	-3.35	0.90
Decidedly worst	-4.01	0.96
Absolutely worst	-4.90	0.36

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V LLA -d/1 MODELING, DESIGN AND
LAYOUT OF A CASCADED
THIRD-ORDER FEED-
FORWARD DELTA-SIGMA
ANALOG-TO-DIGITAL
CONVERTER FOR RF
WIRELESS APPLICATIONS
NERURKAR

Account Number/Name

66640-000
UNIVERSITY OF DAYTON*

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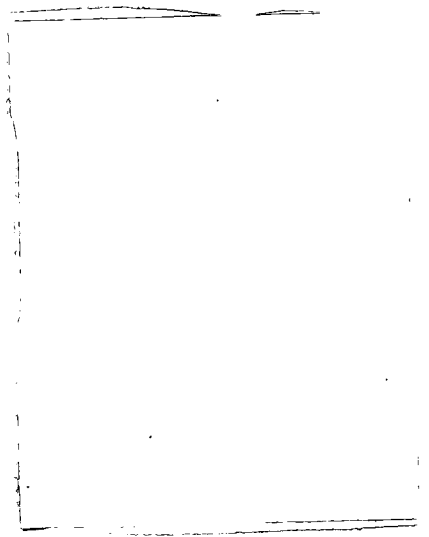
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