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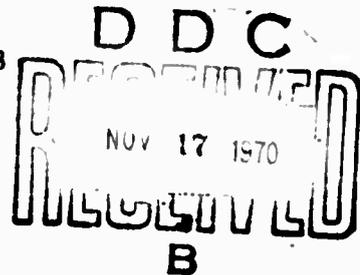
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NORMATIVE DATA ON THE LEAST-PREFERRED  
CO-WORKER SCALE (LPC) AND THE  
GROUP ATMOSPHERE QUESTIONNAIRE (GA)

Allan B. Posthuma

University of Washington  
Seattle, Washington

Technical Report 70-8  
August, 1970



ARPA Order 454  
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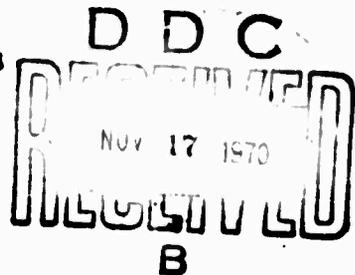
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**Allan B. Posthuma  
University of Washington  
Seattle, Washington**

**Abstract**

This report presents means and standard deviations of Least-Preferred Co-worker (LPC) and Group Atmosphere (GA) scales. Since the number of items contained on both instruments has varied over the years, all results are reported as average item scores (based on an eight-point scale).

The data represent LPC scores collected from various population samples and ratings of group atmosphere by task groups in real life, as well as by laboratory groups.

NORMATIVE DATA ON THE LEAST-PREFERRED CO-WORKER SCALE (LPC)  
AND THE GROUP ATMOSPHERE QUESTIONNAIRE (GA)

Allan B. Posthuma  
University of Washington

This report presents normative data on the means and standard deviations of the Least-Preferred Co-worker scale (LPC) and the Group Atmosphere scale (GA) for various real-life and laboratory task groups, obtained in recent studies.

The Least Preferred Co-worker scale (LPC) has been used extensively in leadership research by Fiedler and his associates, as well as by a growing number of other investigators in the area. The score is based on a set of eight-point, bi-polar adjective scales modeled after Osgood's Semantic Differential (1957). Two scale items are illustrated below:

Friendly:      :      :      :      :      :      :      :      : Unfriendly  
          8      7      6      5      4      3      2      1

Cooperative :      :      :      :      :      :      :      :      : Uncooperative  
              8      7      6      5      4      3      2      1

These items are scored simply by summing the score values over each of the items of the scale. Thus, a twenty-item scale will have a range of scores from 20 to 180, or, as expressed in this paper as item means, from 1.0 to 8.0. The LPC score has been interpreted as a measure of relationship versus task orientation (Bishop, 1964), cognitive complexity (Mitchell, 1970), and attitude of the leaders (Fishbein, Landy, and Hatch, 1970). Fiedler (1967) reviewed the literature on the interpretation of the LPC scale, but a definitive description is still to be written.

The Group Atmosphere (GA) score is obtained from a set of scale items similar or identical to those contained in LPC scales. The score has been used to estimate the quality of leader-member relations, as perceived by the leader. McNamara (1967) has shown that the score is highly related to the group members' loyalty to the leader.

The paper is organized so that samples from similar populations are listed together under the headings of military, business executives, university students, church officials, high school students, post office management, and university faculty. These presumably different normative groups were chosen to determine whether any significant differences existed in means and standard deviation of LPC. Each sample description indicates whether it was drawn from a real-life situation or from a training situation, in which members rated laboratory tasks. Where appropriate, the publication source for each sample is cited.

Over the years the number of items contained in the LPC scale has varied from 60 to 20 items, and the GA scale, from 10 to 20 items. However, since 1955 all have used an eight-point, bi-polar adjective scale. The extra items have been added to the scales, and, therefore, the larger item scales do not represent an entirely different instrument from the lesser item scale. For this reason it seemed appropriate to compare all scales on the basis of average item scores (based on an eight-point scale) for that scale so that the results could be easily compared over various groups. A 16-item LPC scale and a 10-item GA scale are presented as Appendices A and B.

#### 1. Military

##### Sample 1: Naval ROTC Cadets

(a) Description of Sample. This sample was drawn from Naval ROTC cadets participating in military leadership classes at the University of Illinois during 1962. The research involved measuring reaction to participatory and more directive types of leadership. Leaders were senior NROTC students, and membership included NROTC freshmen and sophomores.

(b) Publication. Anderson & Fiedler (1964).

	<u>N</u>	<u>Mean</u>	<u>S.D.</u>
(c) <u>LPC</u> (17-item)	89	3.45	1.26
(d) <u>GA</u> (17-item)			
(1) Leaders	30	6.42	0.57
(11) Members	90	6.80	0.70

Sample 2: ROTC Cadets

(a) Description of Sample. Seniors in the Army and Navy ROTC programs at the University of Illinois participated in three experimental conditions: control, internal stress, and external stress. GA scores represent average of all conditions. Task 1 was structured, and Task 2, unstructured.

(b) Publication. Newese & Fiedler (1965).

(c) <u>LPC</u> (17-item)	165	3.40	1.48
(d) <u>GA</u> (17-item)			
(1) Session One			
(1) Leader	55	6.20	0.70
(2) Members	110	6.06	0.79
(11) Session Two			
(1) Leader	55	6.70	0.78
(2) Members	110	6.30	0.49

Sample 3: Belgian Navy Noncommissioned Officers and Enlisted Men

(a) Description of Sample. This sample was drawn from a group of Belgian navy petty officers and naval recruits. The research involved comparing the performance of groups differing in composition of petty officers and recruits as well as cultural background, including the leadership on situational tasks in a naval basic training base.

(b) Publication. Fiedler (1966).

	<u>N</u>	<u>Mean</u>	<u>S.D.</u>
(c) LPC (17-item)			
(1) Petty Officers	48	3.26	1.29
(11) Recruits	240	3.16	1.62
(d) GA (10-item)			
(1) Leader			
(1) Petty Officers	48	6.73	0.84
(2) Recruits	48	6.75	0.92
(11) Members (Recruits)	191	6.71	0.85

**Sample 4: Canadian Military Officers and Enlisted Personnel**

(a) Description of Sample. This sample was drawn from a group of senior military officers (mostly with rank of major) attending a leadership workshop for the Canadian military college system. For research purposes, 30 recently enlisted recruits were used in laboratory exercises conducted during the workshop. The composition of the groups was mixed, including the leadership, between the officers and men. The workshop was held in the summer of 1967.

(b) Publication. Fiedler & Chemers (1968).

(c) LPC (16-item)

(1) Officers	19	3.77	0.75
(11) Men	30	4.91	1.28

(d) GA (12-item)

    Tank One

(1) Leaders	15	6.05	1.01
(2) Members	30	7.00	0.90

**Sample 5: Canadian Armed Forces in Victoria, B. C.**

(a) Description of Sample. Personnel in this sample participated in a three-hour testing session, during which various paper and pencil questionnaires were completed. The survey was conducted in the summer of 1969.

(b) Publication. Posthuma (1970)

(c) <u>LPC</u> (16-item)	<u>N</u>	<u>Mean</u>	<u>S.D.</u>
(i) Senior NCO instructors	57	4.07	0.82
(ii) Commissioned Officers*	52	3.97	0.78
(iii) OCS Cadets (recruits)	100	3.40	1.24
(iv) ROTC Cadets (2nd year)	84	4.14	1.07

2. Business Executives

## Sample 6: Middle Management Leadership Seminars

(a) Description of Sample. These data come from a series of seminars conducted by the Executive Development Center of the University of Illinois. The program attracts a wide cross-section of middle management from the U. S. for a week-long seminar on various aspects of management. The data were obtained from groups involved in laboratory tasks as part of the leadership training program. The last set of data was obtained from a similar session run for senior federal civil servants by the U. S. Civil Service Commission in Seattle, Washington.

(b) Publication. Fiedler, unpublished.

(c) <u>LPC</u>	<u>N</u>	<u>Mean</u>	<u>S.D.</u>
(i) 1968 Executive Development Seminar (16-item)	33	4.09	0.75
(ii) 1969 Civil Service Executive Seminar (17-item)	31	3.68	0.73
(d) <u>GA</u>			
(i) 1967 Executive Development Seminar (10-item)	18	6.23	0.51
(ii) 1969 Executive Development Seminar (10-item)	22	6.98	0.58

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\* Ex-NCO's, recently promoted to officer status

(iii) 1969 Civil Service Executive Seminar	<u>N</u>	<u>Mean</u>	<u>S.D.</u>
(1) Task One (10-item)			
Leaders	15	6.88	0.58
Members	30	6.65	0.89
(2) Task Two (10-item)			
Leaders	15	7.14	0.73
Members	30	7.30	0.73
(3) Task Three (10-item)			
Leaders	15	6.93	0.95
Members	30	6.77	1.33

### 3. University Students

Sample 7: University students

(a) Description of Sample. These data were obtained from a class of honors students in psychology at the University of Illinois who rated each class during the 1966 session.

(b) Publication. Fiedler & Blood, unpublished.

(c) LPC (No information on number of scale items)

(d) GA (10-item)

(i) Session One	34	5.97	1.11
(ii) Session Two	34	5.89	1.21
(iii) Session Three	34	6.19	1.17
(iv) Session Four	34	5.65	1.25
(v) Session Five	30	6.06	1.03
(vi) Session Six	34	5.98	0.86

### 4. Church Officials

Sample 8: Church Leaders

(a) Description of Sample. These data were obtained at two leadership conferences held for the Unitarian Church. The first was in Toronto, Canada, in October, 1962, and the other, in Davenport, Iowa, in 1968. Delegates to this conference ranged in age from 20 to 60 years, and 80 percent had college training. All held leadership and administrative positions in the Unitarian Church.

(b) The second set of data was published in Mitchell (1970a).

(c) <u>LPC</u>	<u>N</u>	<u>Mean</u>	<u>S.D.</u>
(1) Toronto (20-item)	61	3.70	1.02
(11) Davenport (16-item)	47	3.95	0.88
(d) <u>GA</u> (10-item)			
(1) Toronto (average for 10 tasks)			
(1) Leaders	78	6.58	0.93
(2) Members	139	6.59	0.62
(11) Davenport (for members)			
(1) Task 1	30	7.03	0.98
(2) Task 2	30	6.90	0.83
(3) Task 3	30	7.08	1.00
(4) Task 4	30	7.13	0.74

##### 5. High School Students

###### Sample 9: High School Students

(a) Description of Sample. Girls and boys of high school age who participated in the 1966 Los Amigos de las Americas program in the Honduras. GA scores represent the average of team's ratings of the atmosphere in their team while in Honduras, and was obtained prior to their departure home at the end of the summer.

(b) Publication: Fiedler, O'Brien, & Ilgen (1970).

	<u>N</u>	<u>Mean</u>	<u>S.D.</u>
(c) <u>LPC</u> (16-item)	114	3.85	1.33
(d) <u>GA</u> (17-item)	114	6.42	0.64

## 6. Post Office Management

### Sample 10: Post Office Supervisors

(a) Description of Sample. First line supervisors (level one) and middle management (levels two and three) personnel of various post offices in Illinois. The research involved measuring the effects of leadership training on performance of supervisors, and the GA scores represent the ratings of the supervisors' opinions of the atmosphere of their groups.

(b) Publication: Fiedler, Nealey, & Wood, unpublished.

(c) LPC (16-item)

(i) First line supervisors	91	3.58	1.32
(ii) Second and third level managers	49	3.18	1.13

(d) GA (20-item)

(i) First line supervisors	92	6.31	0.88
(ii) Second and third level managers	52	6.45	0.79

## 7. University Faculty

### Sample 11: University Faculty

(a) Description of Sample. Faculty members at the University of Illinois. The GA scores represent a rating of the faculty member's own department.

(b) Publication. Unpublished (research was in progress at the time of publication of this report.)

(c) LPC (17-item)

(i) Agriculture	155	3.71	0.66
(ii) Engineering	71	3.71	0.70

	<u>N</u>	<u>Mean</u>	<u>S.D.</u>
(iii) Physical Science	121	3.77	0.80
(iv) Biological Science	50	3.56	0.82
(v) Business	55	3.34	0.78
(vi) Education	86	3.62	0.78
(vii) Journalism	23	3.86	0.61
(viii) Social Science	36	3.27	0.90
(ix) Humanities	107	3.46	0.82
(d) <u>GA</u> (10-item)			
(i) Agriculture	153	6.96	2.09
(ii) Engineering	66	7.19	2.07
(iii) Physical Science	107	7.11	1.97
(iv) Biological Science	48	6.91	2.34
(v) Business	53	6.81	2.20
(vi) Education	86	6.90	1.78
(vii) Journalism	22	6.96	1.95
(viii) Social Science	36	6.47	2.19
(ix) Humanities	92	6.67	1.89

### Discussion

The Least Preferred Co-worker Scale. The introduction to this report indicated that different forms of the LPC scale have been used. Both the number of items (from 16 to 20) and the choice of the bipolar adjectives has varied. The vast majority of scales, however, have used either a 16- or 17-item measure. The difference between these two scales is one item (lots of fun - serious) which many researchers have dropped from the 17-item scale, as it appears to be ambiguous for most respondents and yields inconsistent

scores in comparison to other items. Thus, the only difference between the 16- and 17-item scales is this one item and, in addition, the order arrangement of the items. Table 1 (see page 11) indicates minor differences in item means dependent on the number of scale items. A t-test on the item means of the 16- and 17-item scales was not significant, but an F test on the variance produces a difference which is significant at less than the .01 level. However, this difference in the variance is understandable in light of the extra item in the 17-item scale, and future research should be confined to the 16-item scale to avoid this source of variance.

The two groups in Table 1 that reveal the largest difference in scores are business executives (item 3) and post office middle management (item 6). A t-test on this difference was not significant at the .05 level ( $t = 1.39$ ). Therefore the occupational groups considered in this report cannot be significantly differentiated on LPC scores.

A slight trend for higher military ranks to have higher LPC scores is suggested by the data on business executives and church officials, but the post office data provide contrary evidence. Further, education does not appear to be positively related to LPC scores as the university faculty means are lower than less educated business and military executives. (See Table 2, page 12.)

Group Atmosphere. The GA scale produces some interesting comparisons. In comparison to laboratory groups, real-life groups have somewhat lower item means (not significant) and significantly greater variance ( $F = 3.61, p < .01$ ). This difference can probably be attributed to the artificial nature of laboratory groups where it would be difficult to develop strong negative feelings and where the attitude toward the group would produce any severe differences in opinion among group members. In a laboratory group, members are aware of the temporary nature of the experience and are involved with tasks they

TABLE 1

## Summary of LPC Item Means and Standard Deviations

	<u>N</u>	<u>Mean</u>	<u>S.D.</u>
1. Different Item Scales			
16-item	678	3.90	1.05
17-item	1275	3.49	0.95
20-item	61	3.70	1.02
2. Military			
Officers	71	3.87	0.77
NCO's	105	3.67	1.05
Men	270	3.50	1.45
ROTC	100	3.40	1.24
OCS	100	3.40	1.24
3. Business Executives	64	3.89	0.74
4. Church Officials	108	3.83	0.95
5. High School Students	114	3.85	1.33
6. Post Office Management			
First line supervisors	91	3.58	1.32
Middle management	49	3.18	1.13
7. University Faculty			
Science	397	3.69	0.75
Humanities - Social Sciences	143	3.37	0.86
Professional Schools	<u>164</u>	<u>3.61</u>	<u>0.72</u>
8. Overall Average	2014	3.71	1.05

TABLE 2

## Summary of Group Atmosphere Item Means and Standard Deviations

	<u>N</u>	<u>Mean</u>	<u>S.D.</u>
1. Different Item Scales			
10-item (laboratory studies)	755	6.85	0.82
10-item (laboratory and real-life situations)	1662	6.69	1.22
12-item (laboratory studies)	45	6.57	0.96
17-item (laboratory studies)	564	6.36	0.68
20-item (laboratory studies)	144	6.38	0.83
2. Leaders	374	6.58	0.81
3. Members	760	6.70	0.81
4. Laboratory Groups	1508	6.70	0.80
5. Real-life Groups	<u>907</u>	<u>6.49</u>	<u>1.52</u>
6. Overall Average	2415	6.60	1.60

know will last only for a certain length of time. This is not the case in real-life situations, where members hold their jobs for a variety of reasons, and where tensions build up over a considerable period and a complex series of experiences. It is interesting that there are no significant differences between the leader's and the group's perceptions of the group atmosphere. However, it is important to note that none of the leader-member comparisons draws upon real-life situations. The data for real-life groups in this report do not report information for both leaders and their groups. The data from the laboratory groups may not be representative of real-life situations.

The number of scale items seems to affect the results of the GA scale. All the real-life groups used 10-item scales, and these results could not be compared to laboratory groups using a different number of scale items for reasons already discussed. However, when the laboratory groups using the 10-item scale were compared to laboratory groups using the 17-item scale, there was a significant difference in the variance ( $F = 1.46, p < .01$ ), although the means did not differ significantly. These results indicate that the scales operate differently. One possible explanation for this difference may be that the 17-item data were obtained from ROTC students who may have more cohesive attitudes toward members of their groups (and, hence, have a restricted variance in GA scores) than the samples for the 10-item data which included people with a varied background, many of whom were strangers to each other before being brought together in a training session (thus, resulting in a wider range of GA scores).

People differ in the ways they think about those with whom they work. This may be important in working with others. Please give your immediate, first reaction to the items on the following page.

On the following sheet are pairs of words which are opposite in meaning, such as Very Neat and Not Neat. You are asked to describe someone with whom you have worked by placing an "X" in one of the eight spaces on the line between the two words.

Each space represents how well the adjective fits the person you are describing, as if it were written:

Very Neat :    :    :    :    :    :    :    :    : Not Neat  
                   8      7      6      5      4      3      2      1  
                   Very Quite Somewhat Slightly Slightly Somewhat Quite Very  
                   Neat Neat Neat Neat Untidy Untidy Untidy Untidy

FOR EXAMPLE: If you were to describe the person with whom you are able to work least well, and you ordinarily think of him as being quite neat, you would put an "X" in the second space from the words Very Neat, like this:

Very Neat :    :   X   :    :    :    :    :    :    : Not Neat  
                   8      7      6      5      4      3      2      1  
                   Very Quite Somewhat Slightly Slightly Somewhat Quite Very  
                   Neat Neat Neat Neat Untidy Untidy Untidy Untidy

If you ordinarily think of the person with whom you can work least well as being only slightly neat, you would put your "X" as follows:

Very Neat :    :    :    :    :    :    :    :    : Not Neat  
                   8      7      6      5      4      3      2      1  
                   Very Quite Somewhat Slightly Slightly Somewhat Quite Very  
                   Neat Neat Neat Neat Untidy Untidy Untidy Untidy

If you would think of him as being very untidy, you would use the space nearest the words Not Neat.

Very Neat :    :    :    :    :    :    :    :   X   : Not Neat  
                   8      7      6      5      4      3      2      1  
                   Very Quite Somewhat Slightly Slightly Somewhat Quite Very  
                   Neat Neat Neat Neat Untidy Untidy Untidy Untidy

Look at the words at both ends of the line before you put in your "X". Please remember that there are no right or wrong answers. Work rapidly; your first answer is likely to be the best. Please do not omit any items, and mark each item only once.

LPC

Think of the person with whom you can work least well. He may be someone you work with now, or he may be someone you knew in the past.

He does not have to be the person you like least well, but should be the person with whom you had the most difficulty in getting a job done. Describe this person as he appears to you.

Pleasant	: <u>  </u> :	Unpleasant
Friendly	: <u>  </u> :	Unfriendly
Rejecting	: <u>  </u> :	Accepting
Helpful	: <u>  </u> :	Frustrating
Unenthusiastic	: <u>  </u> :	Enthusiastic
Tense	: <u>  </u> :	Relaxed
Distant	: <u>  </u> :	Close
Cold	: <u>  </u> :	Warm
Cooperative	: <u>  </u> :	Uncooperative
Supportive	: <u>  </u> :	Hostile
Boring	: <u>  </u> :	Interesting
Quarrelsome	: <u>  </u> :	Harmonious
Self-assured	: <u>  </u> :	Hesitant
Efficient	: <u>  </u> :	Inefficient
Gloomy	: <u>  </u> :	Cheerful
Open	: <u>  </u> :	Guarded

GROUP ATMOSPHERE SCALE

Describe the atmosphere of your group by checking the following items.

- 1. Pleasant :   /  /  /  /  /  /  /   : Unpleasant
- 2. Friendly :   /  /  /  /  /  /  /   : Unfriendly
- 3. Bad :   /  /  /  /  /  /  /   : Good
- 4. Worthless :   /  /  /  /  /  /  /   : Valuable
- 5. Distant :   /  /  /  /  /  /  /   : Close
- 6. Cold :   /  /  /  /  /  /  /   : Warm
- 7. Quarrelsome :   /  /  /  /  /  /  /   : Harmonious
- 8. Self-assured :   /  /  /  /  /  /  /   : Hesitant
- 9. Efficient :   /  /  /  /  /  /  /   : Inefficient
- 10. Gloomy :   /  /  /  /  /  /  /   : Cheerful

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13. ABSTRACT <p>This report presents means and standard deviations of Least-Preferred Co-worker (LPC and Group Atmosphere (GA) scales. Since the number of items contained on both instruments has varied over the years, all results are reported as average item scores (based on an eight-point scale).</p> <p>The data represent LPC scores collected from various population samples and ratings of group atmosphere by task groups in real life, as well as by laboratory groups.</p>			

14	KEY WORDS	LINK A		LINK B		LINK C	
		ROLE	WT	ROLE	WT	ROLE	WT
	Least Preferred Co-worker (LPC) Group Atmosphere (GA) task groups						