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PERSONALITY FACTORS AND THEIR INFLUENCE ON GROUP BEHAVIOR: A QUESTIONNAIRE STUDY

GENEVIEVE O. ROGGE

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RESEARCH LABORATORY OF ELECTRONICS
MASSACHUSETTS INSTITUTE OF TECHNOLOGY
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Abstract

The purpose of this report is twofold: (a) to describe the construction and analysis of a questionnaire instrument designed to measure some aspects of the individual's personality organization which, it was hypothesized, would influence his behavior in, and reactions to, task-oriented groups; (b) to report significant relations found between the personal characteristics measured by the questionnaire and several features of behavior exhibited in an experimental group.

1. CONSTRUCTION OF THE QUESTIONNAIRE AND PRELIMINARY FACTOR ANALYSIS

The questionnaire* was designed to be used in the Group Networks Laboratory in its research on communication in task-oriented groups (5). An extensive series of pilot studies undertaken by the laboratory in connection with the design of an experiment** (described in section 3) provided the opportunity for conducting a large number of depth interviews with enlisted Navy personnel. Fifty-five men, supplied by the Receiving Station for the First Naval District, Boston, were individually interviewed about their reactions to working in a group and their general feelings toward groups.

Analysis of these interviews suggested that the following personality and attitudinal dimensions would significantly affect behavior in task-oriented groups: (a) a sociability dimension defined at the positive end by the gregarious individual who prefers to work with and around other people; (b) an activity dimension characterized at the positive extreme by the initiative-taking individual who, in a new situation, does not wait for others to act but seeks immediately to dominate and manipulate his environment; and (c) an "expectation" dimension with, on the positive side, the individual who views the world as friendly or, at least, does not expect hostility.

With the interviews as a source for colloquial phrasing as well as content, a number of questionnaire items were constructed to measure these dimensions. Most of the items were of the usual agree-disagree type, consisting of a statement of an attitude with which the subject indicates his agreement or disagreement (AD items). The remaining items were of the write-in type (WI items), consisting primarily of incomplete sentences which the subject finishes in his own words.

From a preliminary group of 45 AD items and 6 WI items pretested on 30 pilot subjects (enlisted Navy personnel), we selected 33 AD and 4 WI items. Of the WI items, three were sentence completion (SC items); the fourth requested from the subject a short statement as to what he would do if he were in a group in which one member was a "troublemaker." The resulting questionnaire included two sections. The first contained the AD items arranged in random order. The second was composed of the WI items.

This form of the questionnaire was administered to 100 new Army recruits from the Reception Center at Fort Devens, Ayer, Massachusetts. The subjects were informed that they were to take anonymously an attitude questionnaire which was not a test and consequently involved no right or wrong answers. They were instructed to respond as

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*I am indebted to Lee S. Christie for his generous suggestions and help in the design of this questionnaire, and for supervising the computations involved in the two factor analyses.

**The design and running of this experiment was a joint effort of Lee S. Christie, R. Duncan Luce, Josiah Macy, Jr., and the author. Other facets of it will be reported at a later date.

honestly as they could for the AD items and to enter the first phrase that occurred to them without concern for grammar or spelling for the WI items.*

Factor analysis of the responses of the 100 subjects to the AD items yielded five factors.** Factors II and III corresponded, respectively, to the activity and expectation dimensions described above. Factors I and IV were both involved in the delimitation of sociability, with Factor I the more purely social or gregarious component. Factor IV was tentatively interpreted as a measure of the degree to which the individual member is self-sufficient within, or emotionally independent of, the group. The fifth factor was not clearly delimited. At the time, it seemed to be a measure of general security-insecurity, and since that was only indirectly related to the primary concern the few items that contributed significantly to it were deleted. However, its reappearance in the second factor analysis permitted a more intelligible interpretation and its defining items have been retained in the final scoring of the questionnaire.

Revision of the remaining AD items consisted of (a) deletion of those items that did not contribute appreciably to any one of the first four factors and (b) construction of new items designed to measure those factors more extensively. Several scales developed by other investigators were consulted as a source for other items that would get at these factors, and some new items were included which were suggested by the work of Gough, McClosky, and Meehl (8) on a scale to measure dominance; by the work of Phillips (12) on a questionnaire to measure attitudes toward self and others; and by Brogden's factor analysis (2) of the Allport-Vernon scale for measuring primary personal values (1).***

Analysis of the WI items showed them to be quite successful in eliciting meaningful responses from the subjects. For these responses we developed objective scoring procedures that yielded high agreement among four judges who independently scored all responses. Pearson product-moment correlations between the subjects' scores and their quasi-Factor scores on Factors I through IV indicated that the SC items provided a significant measure of the sociability dimension. On the basis of a similar correlational analysis, the "troublemaker" WI item was tentatively considered to be a further measure of the activity dimension. Accordingly, two more WI items, both of the SC type, were added to the questionnaire.

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*Exact wording of the instructions may be found in Appendix A, which presents the final form of the questionnaire.

**The interpretation of the results of this first factor analysis is essentially parallel to, though not as straightforward as, that of the second factor analysis based on responses from 360 subjects. To conserve space, only the results of the second factor analysis will be presented in detail. See Tables I, II, and III.

***As arranged in the final form of the questionnaire reproduced in Appendix A, items 1, 3, 6, 10, 11, 17, 18, and 21 were suggested by the work of Gough, McClosky, and Meehl (8); items 2 and 24 were suggested by items in the Allport-Vernon scale (1); and item 13 was suggested by an item in Phillips' questionnaire (12).

Table I

The Correlation Matrix

Item*	2	3	4	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1	0.032	0.195	-0.023	-0.029	0.102	0.035	0.142	0.285	0.076	0.008	-0.055	0.106	0.064	0.020	0.073	-0.009	0.036	-0.035	-0.015	0.074	0.085	0.030	0.137	0.026	0.217	0.097	0.176	0.203
2		0.016	0.044	0.002	0.042	0.093	0.093	-0.034	0.110	0.059	-0.001	0.133	0.029	-0.003	0.077	0.050	0.108	0.003	0.048	-0.014	0.057	0.105	0.066	-0.005	0.057	0.006	0.066	0.056
3			0.145	0.102	0.141	0.050	0.070	0.314	0.234	-0.041	0.069	0.133	-0.060	-0.067	0.290	0.068	0.066	0.090	0.153	0.036	0.125	0.046	0.426	-0.026	0.332	-0.014	0.066	0.363
4				0.022	0.119	0.028	0.113	0.013	0.067	0.069	0.004	0.156	0.091	0.001	0.039	0.140	-0.032	0.113	-0.018	0.008	0.010	-0.023	0.046	0.067	0.070	-0.004	0.014	0.048
6					-0.043	0.031	0.048	0.056	0.110	-0.050	0.070	0.167	0.027	-0.176	0.149	0.138	0.036	0.036	0.096	-0.078	0.053	0.029	0.165	0.017	0.059	-0.229	-0.106	0.060
7						-0.021	0.227	0.127	0.178	0.118	0.088	0.290	-0.138	0.082	0.136	0.149	0.066	0.148	0.035	0.069	0.294	0.081	0.182	0.121	0.101	0.091	0.201	0.168
8							0.047	0.080	0.076	0.086	0.151	0.180	0.079	0.083	0.075	0.120	0.082	0.053	0.132	0.026	0.056	0.146	0.065	0.054	0.052	0.062	0.079	0.077
9								0.191	0.164	0.040	0.037	0.300	0.058	0.005	0.135	0.196	0.003	0.070	0.072	0.016	0.134	-0.025	0.087	0.083	0.119	0.004	0.071	0.103
10									0.134	-0.056	-0.027	0.178	-0.039	-0.117	0.184	0.015	0.023	-0.004	0.117	0.044	0.117	-0.017	0.207	-0.046	0.220	-0.018	0.039	0.230
11										0.072	0.170	0.234	0.025	-0.018	0.224	0.085	0.065	0.099	0.034	0.068	0.092	0.080	0.243	0.084	0.236	0.010	0.114	0.243
12											0.105	0.124	0.135	0.617	-0.030	0.046	-0.029	0.038	-0.010	0.255	-0.007	0.084	-0.087	0.407	0.020	0.190	0.329	-0.009
13												0.244	0.072	0.047	0.067	-0.008	-0.013	0.176	0.121	0.112	0.001	0.169	0.045	0.088	-0.020	0.009	0.152	0.066
14													-0.028	0.050	0.272	0.314	0.069	0.165	0.207	0.133	0.310	0.151	0.164	0.133	0.134	0.027	0.206	0.162
15														0.152	-0.046	0.125	0.014	0.060	-0.064	-0.016	0.123	0.048	-0.108	0.126	0.071	0.097	-0.068	0.007
16															-0.233	0.015	-0.061	0.089	0.000	0.210	0.011	0.013	-0.217	0.434	-0.087	0.302	0.287	-0.073
17																0.042	-0.011	0.089	0.127	0.073	0.105	0.038	0.462	-0.045	0.040	-0.148	-0.035	0.430
18																	0.118	0.090	0.236	0.032	0.127	0.009	0.108	0.032	0.004	-0.106	0.028	-0.031
19																		0.049	0.076	0.003	0.135	0.004	0.074	-0.053	-0.134	-0.196	0.093	-0.029
20																			0.124	0.125	0.110	0.162	0.062	0.161	0.016	0.226	0.175	0.109
21																				0.071	0.109	0.642	0.158	0.006	0.028	-0.151	0.092	0.042
22																					0.109	0.149	0.026	0.229	0.035	0.229	0.406	0.097
23																						0.031	0.140	-0.019	0.127	-0.022	0.077	0.114
24																							0.010	0.073	0.008	0.062	0.148	0.021
25																								-0.036	0.373	-0.131	0.027	0.514
26																									-0.017	0.197	0.273	0.052
27																										0.020	0.059	0.411
28																											0.346	0.135
29																												0.075

*Item 5 was eliminated because of an extreme frequency split.

Table II

The Centroid Matrix

Item*	I	II	III	IV	V	h^2**
1	0.264	0.141	0.283	0.189	-0.189	0.242
2	0.161	0.050	-0.101	-0.076	-0.061	0.048
3	0.424	0.336	0.057	0.245	0.116	0.399
4	0.168	0.066	0.036	-0.171	-0.010	0.063
6	0.112	0.213	-0.261	-0.110	0.183	0.172
7	0.390	0.142	0.119	-0.144	-0.138	0.226
8	0.255	-0.072	-0.171	-0.036	-0.035	0.102
9	0.328	0.190	0.067	-0.212	-0.167	0.221
10	0.286	0.298	0.163	0.189	-0.119	0.247
11	0.402	0.170	-0.044	-0.046	0.169	0.223
12	0.351	-0.480	0.238	-0.206	0.253	0.516
13	0.247	-0.171	-0.224	-0.054	0.129	0.160
14	0.568	0.132	-0.154	-0.259	-0.114	0.444
15	0.112	-0.117	0.054	-0.214	-0.008	0.075
16	0.224	-0.599	0.347	-0.243	0.120	0.603
17	0.344	0.363	-0.180	0.141	0.230	0.356
18	0.277	0.098	-0.176	-0.305	-0.167	0.238
19	0.099	0.063	-0.154	-0.103	-0.179	0.080
20	0.320	-0.154	-0.085	-0.034	-0.057	0.138
21	0.352	-0.113	-0.521	0.268	-0.199	0.519
22	0.332	-0.304	0.128	0.167	0.011	0.247
23	0.330	0.163	0.020	-0.144	-0.196	0.195
24	0.330	-0.345	-0.457	0.319	-0.232	0.593
25	0.421	0.474	-0.077	0.274	0.285	0.564
26	0.322	-0.395	0.181	-0.165	0.184	0.354
27	0.335	0.281	0.243	0.191	0.092	0.296
28	0.183	-0.371	0.339	0.087	-0.177	0.324
29	0.430	-0.336	0.164	0.098	-0.088	0.342
30	0.470	0.299	0.121	0.328	0.253	0.496

*Item 5 was eliminated because of an extreme frequency split.
**Communality.

Table III

The Rotated Factor Matrix

Item*	I	II	III	IV	V
1	0.059	0.274	-0.020	0.025	0.402
2	-0.011	0.062	0.076	0.206	-0.004
3	-0.031	0.595	0.013	0.079	0.093
4	0.050	0.062	0.091	0.220	-0.003
6	-0.145	0.176	0.000	0.198	-0.283
7	0.087	0.179	-0.038	0.342	0.280
8	0.085	0.087	0.214	0.192	-0.046
9	0.033	0.151	-0.070	0.404	0.173
10	-0.075	0.382	-0.029	0.082	0.296
11	0.136	0.386	-0.057	0.223	-0.046
12	0.707	0.007	-0.006	0.086	-0.098
13	0.175	0.078	0.152	0.116	-0.176
14	0.106	0.256	0.133	0.591	0.023
15	0.190	-0.081	-0.041	0.173	-0.012
16	0.751	-0.191	-0.034	0.030	0.028
17	-0.136	0.535	0.044	0.173	-0.173
18	-0.017	0.012	0.071	0.481	0.000
19	-0.100	-0.031	0.112	0.233	0.042
20	0.205	0.075	0.222	0.196	0.015
21	-0.094	0.172	0.674	0.163	-0.036
22	0.395	0.149	0.224	-0.049	0.129
23	0.012	0.154	0.014	0.370	0.184
24	0.069	0.058	0.754	0.050	0.022
25	-0.146	0.727	-0.004	0.072	-0.099
26	0.567	0.118	0.029	0.262	-0.005
27	0.128	-0.099	-0.078	-0.043	-0.072
28	0.429	0.099	0.099	-0.058	0.342
29	0.456	0.123	0.250	0.071	0.230
30	0.068	0.699	-0.003	-0.021	0.050

*Item 5 was eliminated because of an extreme frequency split.

Table IV

The Intercorrelations of the Quasi-Factor Scores

	II	III	IV	V
I	-0.009	0.194	0.079	-0.008
II		0.145	0.191	0.320
III			0.162	0.098
IV				0.195

2. ANALYSIS OF QUESTIONNAIRE RESPONSES OF 360 SUBJECTS

The revised form of the questionnaire was administered to 360 male subjects (all new Army recruits at Fort Devens) prior to their participation in an experiment. The design of the experiment and the discussion of relations between the variables measured by the questionnaire and behavior exhibited in the experiment will be presented in section 3. This section will be concerned solely with the analysis of responses to the questionnaire itself.

a. FACTOR ANALYSIS OF THE AGREE-DISAGREE ITEMS

Thirty AD items were included in the questionnaire. They were scored dichotomously as zero or one, depending on whether or not the response was deemed to be indicative of good adjustment. Item 5 showed an extreme frequency split and was dropped from the battery. Only one of the remaining items, Item 4, showed a frequency split more extreme than three to one. Although Item 4 was included in the factor analysis, it was subsequently eliminated. With no extreme frequency splits, it was deemed reasonable to obtain correlations from the Pearson product-moment formula, since this was computationally easy to apply. Accordingly, correlation coefficients were computed for the 406 pairs formed from the 29 items. The correlation matrix is given in Table I.

The correlation matrix was subjected to a factor analysis that used Thurstone's Centroid Method. Five factors were extracted, and the final residuals had a mean absolute value of 0.034 with a standard deviation of 0.028. Since only 2.2 percent of the residuals lay beyond the 1 percent point of the distribution, the analysis was stopped at this point. The centroid factor loadings and the communalities are presented in Table II.

Orthogonal rotations were performed to obtain simple structure. The factor loadings are given in Table III. Examination of the patterns in the ten plots, taking the factors two at a time, showed the orthogonal structure to be very satisfactory, with a small exception in the I-V plane. It is, therefore, reasonable to view as independent the traits defined by the items which identify the factors.

DESCRIPTION OF THE FACTORS. The items that contribute significantly to each factor are listed below. The description of each item takes into account whether an agree or disagree response was scored as positive.

Item No.	Loading	Description
		Factor I
16	0.75	Prefers to work in a group rather than in isolation.
12	0.71	Does not like to work alone when doing a job.
26	0.57	Prefers, whatever the job, to work in a place where there are other people present.
29	0.46	Does not feel that he works better alone because there is nothing but work to occupy him.

Item No.	Loading	Description
		Factor I (continued)
28	0.43	Does not agree that, because of striving to keep up with the other members, he gets more done in a group.
22	0.40	Does not agree that, as a result of wasting time in social activities, he gets less done in a group.
20	0.20	Does not agree that groups are inefficient, to be used only if the job requires it.
		Factor II
25	0.73	Does not prefer to be a mere member of the group rather than leader.
30	0.70	Likes to have a position of responsibility in his work groups.
3	0.60	Would be a good leader.
17	0.54	Does not dislike telling others what to do.
11	0.39	Does not dislike having responsibility for other people.
10	0.38	Is consulted by people when decisions have to be made.
14	0.26	When in a new group that is just beginning, does not usually wait to see how the group will be organized before finding his place in it.
		Factor III
24	0.75	Disagrees that charitable policies in government weaken the individual's initiative.
21	0.67	Does not always determine what others think before taking a stand.
8	0.21	Does not agree that, because of favoritism among friends, the members of a group should be mere acquaintances.
		Factor IV
14	0.59	When in a group that is just beginning, does not usually wait to see how the group will be organized before finding his place in it.
18	0.48	Does not have more trouble concentrating than others do.
9	0.40	Disagrees that he has less drive and energy than others.
23	0.37	Does not usually sit back and watch the others when in a new group.
7	0.34	When in a new, unorganized group, pitches in and gets things started.
19	0.23	Disagrees that he likes to be leader only when he is the most proficient at the job to be done.

Item No.	Loading	Description
		Factor V
1	0.40	Usually takes the responsibility for introducing people when a new group is being formed.
28	0.34	Does not agree that, due to striving to keep up with the other members, he gets more done in a group.
10	0.30	Is consulted by people when decisions have to be made.
6	0.28	Does not usually have to stop and think before acting.
7	0.28	When in a new, unorganized group, pitches in and gets things started.

Before discussing the interpretations of the factors, there are two points concerning the derivation of the interpretations and one note of caution that should be stated. First, both the obvious, or surface, content of the item and its broader implications for behavior were considered in deciding the psychological nature of the item's contribution to a factor. Second, the results and interpretations of factor analyses carried out by other investigators which are relevant to this study were kept in mind throughout the interpretation of the present analysis. Finally, since the total number of items contributing to each factor is small, interpretation of the factors must be considered provisional.

The items contributing to Factor I have to do with a preference for working in groups rather than alone, as well as an over-all positive approach toward work groups; that is, competition is not considered the main driving force in groups, nor are work groups thought of as essentially time-wasting and inefficient. This factor has been named "affability in work groups."

The items that define Factor IV also deal with the individual's reactions to groups, but they are more particularly concerned with the specific manner in which the individual relates himself to the group than with the favorable or unfavorable character of his general orientation toward the group. Specifically, this factor may be said to measure the level of self-sufficiency characteristic of the individual as he functions within a group. The individual who is high on this factor is not likely to be overly dependent on the group for approval, direction, and the like. To refer to the specific content of the items, the high individual in general does not compare himself unfavorably with others in drive, energy, and ability to concentrate; and, more specifically, when involved in a new and unorganized group he is not afraid to pitch in and get things started, nor does he sit back to watch the others and wait for direction and structure. This factor has been labelled "self-sufficiency of the individual within the group."

The items that identify Factor II deal primarily with a preference for a position of responsibility in one's work and secondarily with a willingness to assume responsibility for other people. This factor is interpreted as a measure of "initiative-taking" or "activity-level"; that is, the individual who scores high on this factor desires to take an active role in controlling and manipulating his environment. It seems reasonable

that the high individual, in order to continue the active role, would often have to assume responsibility for other people; and such an interpretation would explain the secondary position on this factor of items that characterize the high individual as not averse to accepting responsibility for others in terms of making decisions and giving orders. This factor has been named "initiativity."

There is some overlap between Factors II and IV because of the presence in both of item 14, which contributes the highest loading to Factor IV and the lowest to Factor II. The behavior referred to in item 14 (not waiting to see how a new group will be organized before finding one's place in it), however, has a significance for Factor IV that is different from its significance for Factor II. In connection with Factor IV, the individual does not "hold back" because he is "free" to act, because there is no excessive dependence on the group for emotional control that would inhibit action; whereas with Factor II, the individual does not "hold back" because he "must" act out of his need to dominate the environment.

The items that delimit Factor V deal with the relation of the individual to people in general as well as to people in groups. The individual who scores high on this factor seems to assume adult social responsibility for others to the degree that in a new group he introduces people, helps get things started, and does not use competition with other group members as his incentive to work. Also, he is consulted by others and does not display unusual hesitation when action is required. The items that critically defined Factor V in the first factor analysis,* and were deleted because of the seeming irrelevance of Factor V (then interpreted as a measure of general security-insecurity), may be examined for supplementary information. In terms of their content the high-scoring individual does not find it hard to make conversation nor does he feel uneasy when meeting new people. This suggests that Factor V may be a measure of the degree to which normal consideration for, and ease of associating with, other people has been developed. This is related to the security-insecurity dimension, noted in the first factor analysis, in the sense that the development of this social maturity depends in part on whether or not the individual basically feels secure. There is some overlap between Factors V and II, and a reasonable explanation is that willingness to take such responsibility for others can be the result of an unavoidable aspect of initiative-taking (Factor II); it is also an integral part of the behavior of those who have attained a basic social ease or maturity (Factor V). Factor V has been named, somewhat unsatisfactorily, "considerateness."

The interpretation of Factor III must be especially tentative, since it is defined by only three items. The individual who scores low on this factor fears that charitable

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*The items that significantly identified Factor V in the first factor analysis were, in order of importance, "I find it very hard to make conversation with people I don't know well" and "I usually feel uneasy when I meet people for the first time." Their loadings were, respectively, 0.56 and 0.53. Disagreement with these items was scored as the positive response.

governmental policies have unfavorable effects on the individual's willingness to provide for himself, and he is afraid to commit himself before he has ascertained the views of others. He also feels that favoritism is unavoidable in groups where some members are friends. The content of these items is similar to a few of the statements characteristic of the authoritarian personality described in current literature. For example, Maslow (11) states that the world as conceived by the authoritarian is a frightening place in which people are essentially hostile to one another and are viewed as "primarily selfish or evil or stupid." In the light of this description, the low-scoring individual suggests facets of the authoritarian and the high-scoring individual of the nonauthoritarian personality. Although this overlap is only to the extent of three questionnaire items, it can be utilized in interpreting Factor III if the interpretation serves as a basis for the construction of additional items and is considered provisional upon the outcome of further study with such new items. Accordingly, this factor has been tentatively named "other-confidence," to refer to the basic favorable or unfavorable expectation that the individual has of the world and the people in it.

Relation to Other Factor Analytic Investigations. As indicated earlier, the results of other studies were kept in mind throughout the process of identifying the present factors. Their relation to the factors described by other investigators is as follows.

Fleishman (6) in a study of supervisory behavior has described two independent factors that correspond closely to our Factors II and V. One, named "initiating structure," was concerned with the degree to which the leader planned, scheduled, criticized, and so on; the other, called "consideration," dealt with the degree to which the leader considered his workers' feelings. Their similarity to the present Factor II (initiativity) and Factor V (considerateness) is manifest.

Guilford and Guilford (9) have presented the results of a factor analysis of several tests of introversion-extroversion, and the results of the present study are similar in several respects. The Guilfords described their first factor as "sociability or gregariousness"; it is similar to the present Factor I (affability in work groups). Their second factor, described as an "emotional" factor involving "a thread of emotional immaturity or emotional dependency," is similar to the present Factor IV, which is described in the positive direction as "self-sufficiency of the individual within the group." There is some overlap between their Factor III, described as involving aggressiveness and dominance, and the present Factor II (initiativity), and between their Factor IV, on which the high-scoring individual is, among other things, considerate of the feelings of others and the present Factor V (considerateness).

The partial relation of Factor III to the conception of the authoritarian personality has already been noted. It is also related to Brogden's factor analysis (2) of the Allport-Vernon scale (1) from which item 24 (which has the highest loading on Factor III) was adapted. Brogden's data show that this item has its highest loading on the factor identified as "humanitarian tendency" and it also has a significant loading on the factor named "tendency toward liberalism."

Derivation of Quasi-Factor Scores. Scores were derived for each subject on each factor, and it was in terms of these scores that behavior on the questionnaire was related to behavior in the experiment. These relationships will be discussed in the third section, but it is appropriate here to describe the nature of the scores. To obtain scores that would be independent (uncorrelated) and maximally meaningful, and would avoid the extensive labor required in computing exact factor scores, the following method was used. Items that contributed significantly to more than one factor were omitted from the scoring. Also omitted were items that did not contribute appreciably to any factor. The remaining group of scorable items included: for Factor I, items 12, 16, 22, 26, and 29; for Factor II, items 3, 10, 11, 17, 25, and 30; for Factor III, items 21 and 24; for Factor IV, items 7, 9, 14, 18, and 23; and for Factor V, items 1 and 6. A subject's quasi-score on a factor is the sum of his positive responses to the relevant items. Thus, scores range on Factors I and IV from 0 to 5, on Factor II from 0 to 6, and on Factors III and V from 0 to 2.

The Pearson product-moment intercorrelations for the quasi-factor scores are presented in Table IV. The only significant correlation is between Factors II and V. This is probably a result of the combined effect of items 1 and 6 (scored on Factor V) and item 10 (scored on Factor II), which had definite, but not critical, loadings on the other factor. The psychological significance of this overlap between Factors II and V has already been discussed.

b. ANALYSIS OF THE WRITE-IN ITEMS

Of the six WI items, five were of the sentence-completion type and were combined to give one total score. This type of item has been studied by several experimenters in the last decade. Rohde (13) administered the Rohde-Hildreth Sentence Completion Blank to a sample of college students and reported that a qualitative analysis of the individual's responses was very useful. Cameron (3), and Cameron and Magaret (4) have used incomplete sentences that ended in "because" or "although" to study language and thought processes in the schizophrenic and in the normal adult subject. Their analysis, however, was concerned only with the degree of coherence and clarity of the phrases which the subjects constructed to complete the causal relationship. Symonds (14) has reported on the use of the SC item as a projective technique by the OSS in its assessment program. The responses to 100 SC items of a sample of individuals with high emotional stability and high over-all ratings were compared with responses of a sample of individuals with low ratings, but no trends were observed in the responses which would differentiate the high from the low individuals. Symonds concluded that the SC test was useful when interpreted in conjunction with other test and interview data for a particular subject, but it could not safely be used alone for prediction purposes. Fouriezos, Hutt, and Guetzkow (7) used SC items in conjunction with Rorschach and TAT protocols as a basis for rating the need structure of individuals in discussion groups; but the method of scoring the SC items is not reported.

Since the SC item combines the advantages of a projective technique and quick, paper-pencil administration, it could prove to be an especially valuable type of item, provided that objective, reliable scoring procedures can be developed. The projective technique has two special advantages: it generally provides more revealing data about personality organization than does the AD item; it does not require the subject to evaluate and report his own attitudinal and personality characteristics, a task which he may not be able to do honestly or accurately; rather, the experimenter evaluates the significance of his responses.

The five SC items used in the final form of the questionnaire were:

1) When I'm in a group, I usually.....
2) Groups nearly always.....
3) The members of a group should never....
4) In most groups you find.....
5) I think that groups.....

Preliminary inspection of all responses revealed frequently recurring categories or types of response. Furthermore, a particular response-type was usually, though not exclusively, given to a particular SC item. For example, completing the sentence by naming a particular kind of person to be found in groups, e.g. a "wiseguy" or a good leader, usually occurred in response to item 4, but sometimes to item 2 after insertion of the verb "have." A scoring key was devised on the basis of the categories or types of response, regardless of the particular SC item to which they were given. For example, if a subject completed any of the SC items by mentioning unfavorable types of people, such as "troublemakers" or "wiseguys," the response was scored as a negative (minus) one. If favorable types were mentioned, such as "good workers" or a "good leader," it was scored as a positive (plus) response. Finally, if the type of person mentioned was neither agreeable nor disagreeable, e.g. "men and women" or "people," the response was considered neutral and received a score of zero.

Item 3 was not included in the scoring because it generally elicited stereotyped, uninformative responses. For example, more than half of the subjects responded to this item with some version of the phrase: "The members of a group should never fight." Responses to this item were not completely neglected, in that the judges were instructed to read them for supplementary information that might clarify ambiguous responses to other items. For example, if a subject responded to item 4 with the single word "clown," consideration of his response to item 3 might indicate whether he was using the term in the sense of "wiseguy" (which is scored minus) or in the sense of someone who is fun at parties (which is scored plus). A total sentence-completion score was obtained for each subject by totaling his scores on items 1, 2, 4, and 5, with a plus given two points, a zero (neutral) one point, and a minus, no points. Thus, scores ranged from zero (a minus on each of the four responses) to eight (a plus on each response).

The next question was: Can the scoring procedure devised for the SC items be used

reliably? To answer this, three judges, in addition to the experimenter who had devised the key and scored all responses according to it, were trained to use the score categories. Training consisted of the following. First, each judge carefully read the instructions. Second, questions were raised by the judges in one another's presence (so that each had the same training experience) and were answered by indicating the relevant statements in the scoring key. Third, the responses of 15 pilot subjects were presented to the judges, who discussed them in common with the experimenter, who also acted as a judge, until complete agreement was reached as to the proper score for each of the sample responses. Then each judge independently scored all responses of all 360 subjects. Once the actual judging process had begun, judges were not permitted to consult with one another or to ask any further questions.

The reliability with which the scoring categories were applied to the four SC items was computed by the following method. The total possible number of pairwise agreements for a given judgment, that is, the scoring of one SC response for one subject, is given by the formula $\left[N(N-1)\right]/2$, where N equals the number of judges. With four judges this value is six. Since four judgments are made for each of the 360 subjects, the total possible number of agreements, i.e. if there were perfect agreement on each judgment, is 8640. The ratio of actual or obtained agreements (taken pairwise over the four judges) to the total possible number of agreements gives a reliability figure. Its value in the present case was 0.981. A reliability value can be computed for each SC item separately. That is, with a maximum number of six agreements for each of 360 responses to a particular item, the total possible number of agreements is 2160. The resulting ratios follow: item No. 1, 0.981; item No. 2, 0.979; item No. 3, 0.988; item No. 4, 0.975. It may be concluded that the present scoring key can be applied to these SC items with very high reliability.

Descriptively, the SC score can be said to be a measure of over-all positive or negative orientation toward groups. As such, it was an additional, and in one sense broader, measure (it was not limited to on-the-job attitudes toward groups) of this dimension than Factor I (affability in work groups). A Pearson product-moment correlation was computed between I scores and SC scores for all 360 subjects; its value was 0.502 with a SE of 0.040. Since the distribution of the quasi-factor scores of all subjects on Factor I was markedly skewed at the high end (81 subjects attained the highest possible score of 5), it seemed advisable to differentiate further among the high-scoring group. Accordingly, since the SC score and quasi Factor I score seemed to be measuring aspects of the same dimension ("sociability"), these two scores were summed for each subject. The resulting distribution was a more satisfactory approximation to a normal curve.

Responses to the remaining WI item, which were in the form of a short statement from the subject as to what he would do if there were a "troublemaker" in his group, were scored in terms of the type of action proposed. For example, some of the response categories were: (a) removal or expulsion of the "troublemaker" from the group;

(b) a cooperative attempt on the part of the subject to discover the "troublemaker's" problem and help him solve it; (c) reporting the "troublemaker" to the person in charge and letting the latter handle it; or (d) simply to avoid the "troublemaker" and, consequently, to ignore the whole situation. The complete list of response categories and instructions for scoring are given in Appendix C. The reliability with which this scoring key could be applied was determined in the same fashion as for the SC items. The average level of pairwise agreement was 0.976.*

It had originally been hoped that the responses to this item would constitute a further measure of the dimension of initiative-taking (Factor III). However, although the Pearson product-moment correlation between scores on the TR item and quasi-scores on Factor II was significant, its value (0.272) was not as high as expected. The explanation for this is probably to be found in an inadequacy of the item itself, namely, its failure to elicit revealing information from all the subjects. The responses of approximately one-third of the subjects were scored in neutral or middle categories because of their stereotyped nature. For example, the full response of many subjects was the uninformative statement that they would talk to the troublemaker. Since the quasi-Factor II scores yielded an approximately normal distribution and thus permitted adequate differentiation among the subjects, it was decided to omit the "troublemaker" WI item from further consideration.

The "troublemaker" item yielded one further result that is related to the interpretation of Factor V. Three of the response categories used to score this item were partly defined by whether the action advocated by the subject was cooperatively oriented and took into account consideration for the "troublemaker's" feelings (category H) or whether it was peremptory and abrupt as far as the "troublemaker's" feelings were concerned (categories C and D). The responses of 134 of the 360 subjects were scored in these categories. According to our interpretation of Factor V as a measure of "considerateness" it is to be expected that subjects who score high on this factor will be more likely to suggest dealing with the "troublemaker" in a way that displays consideration of his feelings. To test this, a chi-square was computed in which Factor V scores were arrayed against "considerate" and "inconsiderate" responses of the 134 subjects. It was significant beyond the 5-percent level. Subjects who gave "considerate" (category H) responses were more frequently the high scorers on Factor V; subjects who gave "inconsiderate" (categories C and D) responses were more frequently the low scorers. This finding supports our identification of Factor V as "considerateness."

*The total number of subjects in this computation was 358 instead of 360. Two subjects were omitted, since they did not respond to the item.

3. RELATION BETWEEN BEHAVIOR ON THE QUESTIONNAIRE AND BEHAVIOR IN THE EXPERIMENT*

The 360 subjects whose responses to the questionnaire were discussed in section 2 participated in an experiment after completing the questionnaire. Analysis of the significant relations between behavior on the questionnaire and behavior in the experiment will be indicative of the usefulness of the questionnaire.

The design of the experiment was as follows.** The subjects were placed in separate groups of five men each and were given a task of the following kind. Each member of the group was given a different bit of information; the problem was to circulate this information throughout the group by means of written communication. The task was completed when every member was in possession of all the information.

The five men were seated around a table which has been described elsewhere (5, 10). The table was so constructed that though the men were not visible to one another they could communicate by means of written messages. There were restrictions imposed on the lines of communication that were permissible within a group. Three different networks (patterns of communication channels within a group) were used: circle, pinwheel, and governor. Although these networks have been described elsewhere (5), it will be useful to summarize their important characteristics.

In the circle network every man can send messages to and receive messages from each of two other men. Therefore, each man has access to two reciprocal channels of communication. This gives each man direct contact with two of the other four men and indirect contact (via an intermediary man) with the other two. Though each man has a different pair of neighbors, each position is essentially equivalent in that each has two reciprocal channels.

In pinwheel, all communication channels are one-way; that is, they are either incoming or outgoing but never both (reciprocal). Since each position sends to and receives from two positions, each man has access to four communication channels (two incoming and two outgoing) and thus has some kind of contact with the other four men. As in circle, there is only one type of position.

In governor, as in circle, all channels are two-way (reciprocal); however, there are two types of positions in this network. Two of the men (centers) have reciprocal channels with the other three men, but not with each other; and these other three (peripheral) men have no channels other than those linking them to the two centers.

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*All correlations reported here were obtained by the Pearson product-moment method. All contingency tests were computed from two-by-two tables unless otherwise indicated. Chi-square was used when frequencies were adequate and Yates' correction for continuity was applied when necessary. When frequencies were too small to permit use of chi-square, Fisher's exact test was employed.

**A complete account of the experimental design will not be given, since only a brief description is needed to make clear the nature of the behavioral measures that were analyzed in relation to questionnaire behavior.

There were 24 groups run on each of the three networks, giving a total of 72 groups. As indicated earlier, the 360 subjects (five men per group) were enlisted Army personnel from Fort Devens, Ayer, Massachusetts.

After taking the questionnaire, the subjects were instructed in the experimental procedure. It was explained that each member would be given the same set of three photographs, but that each would have his set arranged in a different order. Thus one of them might have Photograph I in the left position; another might have it on the right; and for still another it might be in the middle. Subjects were assured that on any given trial everyone would have a different order or arrangement. Their job was to find out the order in which each man's photographs were arranged. Each man had a buzzer at his work-space which he was instructed to press when he had obtained all the information and had recorded it on his answer sheet. The subjects were told that they would be stopped at the end of ten minutes even if some had not finished. It was explained that when they had finished, or had been stopped, each man would be given a new set of pictures, and a new task would begin. The subjects were told that the experiment would continue until the group had completed two successive tests with no errors, that is, when each man reported the other four picture arrangements correctly; however, the actual terminal point was 13 trials if they failed to get their successive tasks correctly. Finally, the procedure for giving them information about their error count was demonstrated. This involved a report at the end of each task of the total number of errors made by the whole group on that task.

Subjects were given no information on the pattern of their network. Each man knew only to which man he could send messages and from whom he could receive them. Nor were subjects given any warning of the difficulty they would experience in finding a common language to describe the stimulus material. Though there were discriminable differences in the facial expressions of the three photographs (all of the same person), these differences were not in terms of such obvious cues as varying mouth or eye positions. Consequently, the subjects tended to identify the pictures spontaneously by mood-connoting adjectives; for example, the "tired" one or the "bored" one. This almost always resulted in confusion with, for example, subjects using the same adjective to refer to different pictures. Thus, the elimination of confusion by establishing a common code, i.e. a set of names for the three pictures whose "meaning" was the same for all members of the group, was the critical factor in problem solution (learning to circulate the information accurately).

Before the subjects were started on the experimental problem they were given two practice trials in which to familiarize themselves with the apparatus and the mechanics of sending messages, recording answers, and the like. This stimulus material was unambiguous, consisting of a set of three primary colors arranged in different orders. At the end of the experiment a questionnaire which inquired into their reactions to their group and its performance was administered to the subjects.

Three sets of measures of behavior in the experiment will be discussed in relation

to personality questionnaire responses. The first set of measures is derived from a content analysis of messages sent on the two practice trials.* The second set includes two over-all measures of group performance, namely, a rough index of learning or error reduction in each group and a measure of over-all message output for each group. The third set of measures is concerned with responses to the postexperiment questionnaire covering the subject's reactions to his group.

a. CONTENT ANALYSIS OF MESSAGES SENT ON THE PRACTICE TRIALS

The practice trials were chosen for analysis for the following reason. Once the group has developed an organizational structure, isolation of differences in behavior attributable to individual personality characteristics becomes quite difficult. Since the practice trials were first in the series, they offered the best opportunity to get at such relationships, and the messages sent on the two practice trials were subjected to a partial content analysis. Any message or part of a message that fitted into one of three categories was tallied as one entry. All messages whose content did not relate to the limited set of categories were ignored. The categories were as follows.

1. Information Request: Any message, whether request or order, which sought information about some other member's arrangement of the stimulus material was tallied here (e.g. "Send me your orders" or "Send me man B's information"). If a particular message included a request, by name, for more than one man's information, it was nevertheless recorded as one entry. This category also included information requests that did not specify a particular man (e.g. "Send me what you have so far.").

2. Directions Given: Any message that proposed, whether in the form of a request or a command, a specific method of handling the information was recorded in this category (e.g. "Whenever you get any information, send it to every man you're in touch with," or "Please send your information to man D because he can send it on to me"). Those directive messages which sought information as defined in the first category were excluded from this category and tallied only in category 1.

3. Error Recognition: Subjects were informed in the instructions that since on any trial every member would have a different arrangement of the stimulus material it would be an error (either on their part or someone else's) if their answer sheet showed two or more men with the same arrangement. Any message making direct use of this knowledge (e.g. "Men D and E have the same order so one of them is wrong") was recorded in this category. It was possible that the sender of the message might himself be the source of the error (e.g. by misinterpreting his incoming information). However, no check was made on this since, with such unambiguous stimulus material, such an event would be most unlikely.

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*The analysis of the experimental trials the primary purpose of which is to determine the conditions under which ambiguity is reduced and a successful common code is established, has not yet been completed.

Since the identification of messages to be tallied in these categories was quite simple and unambiguous, it was not considered necessary to test them for reliability (interjudge agreement as to their applicability). The relationships found between personality characteristics and message-sending behavior will be discussed separately for each of the three message types.

Information Request. It was hypothesized that, other things being equal, the individuals who scored high on the dimension of initiative-taking (Factor II) would, in attempting to take an active role in the situation, send a higher proportion of information request (IR) messages. In order to make other factors as equal as possible, it was necessary to rule out differences in such message sending that arose from the exigencies of the particular group situation. For example, in a given group each member might send out his information so quickly that the need for IR messages in that group would be relatively low; in another group unusually slow sending on the part of one member would result in relatively high pressure on the other members to request his information. Therefore a score was computed for each subject that represented the proportion, relative to his group, of IR messages sent by that subject. Specifically, the total number of IR messages sent by a given subject was divided by the total number of IR messages sent by the whole group. This value, expressed as a percentage, was the subject's IR score.

Since subjects in both circle and pinwheel are all in the same position in that each has two incoming and two outgoing channels, they were lumped together to give a total N of 240 for the following computation. The correlation between IR scores and quasi Factor II (initiativity) scores was found to be 0.156, which is significant beyond the 0.01 level.* Thus, for subjects in circle and pinwheel groups there is a significant, but small, positive relationship between sending IR messages and tendency toward inititiative-taking (Factor II).

The subjects in governor groups were treated differently because all subjects did not have an equal number of incoming and outgoing channels. Accordingly, the center men in governor were considered separately from the peripheral men.

Considering the two centers in the same group, each was ranked as to whether he was "high," "low," or "tied" on Factor II, as compared with the other center. Similarly, each center was ranked as "high," "low," or "tied" on his IR score, as compared with the other center. Accordingly, a three-by-three chi-square table was set up. The resulting value was 5.33, which is significant beyond the 0.02 level. A similar chi-square based on all peripheral men was computed, but it was not significant (the probability level was 0.50). However, comparison of the distribution of the quasi Factor II scores of the peripheral men with the distribution of scores for the whole

*The correlations for circle and pinwheel groups treated separately were, respectively, 0.285, which is significant beyond the 0.01 level, and 0.195, which is significant beyond the 0.05 level.

sample shows that among the peripheral men there were about half as many high scorers and twice as many low scorers as in the whole sample. Consequently, the failure to demonstrate a significant relationship among the peripheral men may well be due to the heavier concentration of low scorers.

Directions Sent. Factor II (initiativity) was also hypothesized as an important determiner of sending messages containing directions. Of the 360 subjects only 23 sent such messages. A chi-square test was run, comparing the 23 who sent directions with the 337 subjects who did not in terms of their quasi scores on Factor II. In order to obtain adequate frequencies, the distribution of scores on Factor II was divided approximately in half, and subjects were accordingly categorized as either low or high scorers. The resulting chi-square value, 4.45, was significant beyond the 0.05 level. Subjects who sent directions were more likely to be high scorers on Factor II than those who did not.

Error Recognition. There were 44 subjects out of the total sample who sent messages of this type. Nine of these cases represent a special class and will be discussed separately. Chi-square tests were run to determine whether or not the remaining 35 men differed significantly from the rest of the sample on any of the dimensions measured by the questionnaire. It was found that these 35 men were significantly different with respect to quasi scores on Factor III (other-confidence) which ranged from 0 to 2. The chi-square value from the two-by-three table was 8.52, which is significant beyond the 0.02 level. Specifically, those men who sent messages telling others they were in error were more frequently low scorers on Factor III, (i.e. they were more inclined to be wary and suspicious of the world). A plausible interpretation of this result is that those who generally conceive their environment to be hostile find it easier to call others to account.

The nine men referred to earlier constitute a special class in that they sent error recognition (ER) messages only after someone else had sent them. That is, these nine subjects sent ER messages on the second practice trial only, and in every case some other man had previously sent an ER message on the first trial. The average of the quasi Factor III scores for these nine men is above the average for the whole sample (i.e. they are not inclined to be suspicious and wary). Though the paucity of such cases does not warrant a statistical test, this finding is in line with the interpretation.

b. OVER-ALL GROUP PERFORMANCE: LEARNING AND MESSAGE OUTPUT

Since the three externally imposed communication networks differed in important ways, it was expected that they would differentially favor the influence of the personality characteristics measured by the questionnaire. This expectation was satisfied. Consequently, the results will, for the most part, be discussed separately for each network.

Because these results do not in every case reach adequate significance levels, the reason for their inclusion will be stated. Since the purpose of the experiment was not to investigate the effect of personality characteristics on performance but to determine the conditions under which effective ambiguity (noise) reduction occurs, the isolation of

differences in behavior related to personality differences among the subjects is difficult. It was less difficult with behavior on the practice trials, on which the effect of developing group structure was less and the demands of the difficult experimental task were absent. However, the results presented in this section are based on measures of performance throughout the experiment and they necessarily reflect the influence on behavior of many complex factors; for example, the particular structure developed by the group. Since this only confuses the picture as far as the effect of personality factors is concerned, any definite relationships that can be isolated are worth mention. Therefore some relationships that serve to strengthen interpretations suggested by significant results will be discussed although they fail, per se, to reach significance. Finally, such a discussion may prove a source for hypotheses for later research. Of course all of these results are provisional upon future research in which the influence of personality factors will be an intrinsic part of the experimental design. (That is, subjects will be selected for variation in personality characteristics and observed in experimentally controlled situations.)

Learning or Error Reduction. The index of learning used was the total number of errors made by the group; that is, a high score means many errors and therefore little learning. Scores ranged from 3 to 371.

From the 24 pinwheel groups there is a significant, negative correlation between the average of members' quasi Factor II (initiativity) scores and total errors. The value of the correlation was -0.457, which is significant beyond the 0.05 level. That is, groups with higher averages on initiativity were more successful in reducing errors. The corresponding correlations for circle and governor groups are, respectively, -0.014 and -0.108, neither of which is significant. It may be that the absence of directly reciprocal communication channels which is unique to pinwheel may produce some initial restraint. Consequently, in pinwheel the more initiative-taking groups (those whose members average higher on Factor II) will have more chance of success; in circle and governor other factors will play an important role.

In both pinwheel and governor the dimension of sociability bears some relation to error reduction. The correlation between the sociability level of a group (average of members' combined scores on Factor I and the SC items) and its total errors is 0.352 for the 24 pinwheel groups and 0.316 for the 24 governor groups. Combining pinwheel and governor subjects into one group, the value of the correlation is 0.280, which borders on significance. (For a sample of this size, a correlation of 0.285 is needed for the 0.05 level.) Apparently the less sociable groups are more successful in reducing errors. For the circle groups, the relationship, though not significant, is in the opposite direction. The value of the correlation is -0.241. That is, in circle groups sociability has, if anything, a favorable effect on error reduction.

In circle groups there is a definite, though not significant, correlation (0.367) between the average of quasi scores on Factor V (considerateness) and total errors. That is, groups who average high on considerateness tend to be unsuccessful in reducing

errors. If one may assume that the situation in circle groups, where all communication channels are reciprocal and the same number of channels is available to each man, favors informal, "friendly" interaction, it would then seem reasonable that additional tendency to be considerate of others would work against effective performance. The corresponding correlations for pinwheel and governor, though small and also not significant, are in line with this interpretation. For governor groups, where there is reciprocal communication but inequality in number of channels available, the correlation (0.167) is smaller but in the same direction as in circle. For pinwheel groups, where reciprocal channels are absent, although each member has the same number of channels, the correlation (-0.237) is in the opposite direction. That is, the more considerate groups tend to have a lower error level.

Message Output. Considerateness level is also related to message output in governor groups. To obtain an index of average message output, the total number of messages sent by a group was divided by the number of trials completed by that group. For governor groups, the correlation between average message output and level of considerateness is 0.561, which is significant beyond the 0.01 level. The corresponding correlations for circle and pinwheel are, respectively, -0.089 and -0.035, neither of which comes close to significance. It may be recalled that in governor, unlike pinwheel and circle, there is inequality in the number of available channels. Specifically, there are center men who have more, and peripheral men who have fewer, channels. Consequently, compared to demands on circle and pinwheel subjects, the demand on center men is greater and on peripheral men it is less. It seems reasonable that considerateness and willingness to assume social responsibility (Factor V) would partly determine whether or not the center men meet the demand for messages and whether or not the peripheral men keep sending after minimum demands have been met.

c. SUBJECTS' EVALUATIONS OF THEIR GROUPS

From 15 AD items inquiring into the individual's feelings about the experiment (these items were included in the questionnaire administered at the end of the experiment) three independent measures* were obtained. Each of the three measures had five items contributing to it; the sum of the individual's positive responses to the relevant items for a given measure represented his score on that measure. Thus the possible range of scores on each was from zero to five. The measures were as follows:

1. Satisfaction with the Job. Items such as "I truly enjoyed my job" and "I considered my job fairly pleasant" defined this measure.

2. Satisfaction with Own Performance. Items such as "I feel sure my answers were correct" and "I would be very surprised if a lot of my answers were incorrect"

*This post-questionnaire was used in a previous set of experiments conducted by the GNL and the three scores derived from it correspond to three independent factors yielded by a factor analysis of the questionnaire reported elsewhere (5).

defined this measure.

3. Satisfaction with the Organization Developed by the Group. Items such as "The organization our group developed was very effective" and "Our group organized its work about as well as other groups" defined this measure.

In order to test for differences in subject satisfactions attributable to variation in personality characteristics it was again necessary to control differences arising from the particular circumstances of each group. For example, members of groups that successfully solved the problem were generally more satisfied with their jobs than were members of unsuccessful groups. Consequently, an average was computed for every group on each of the three satisfaction measures. Then only those individuals whose scores deviated markedly from the group average were analyzed in terms of their personality characteristics.

Satisfaction with the Job (SJ). Individuals who deviated in either direction from the group average on job satisfaction were significantly different from the rest of the sample with respect to Factor III (other-confidence).* However, the direction of the relationship is different in pinwheel from that in circle and governor. In the pinwheel groups 18 subjects were more than 1.5 points below the group SJ average. Of these dissatisfied subjects only one was a low scorer on Factor III (i.e. conceived his environment to be hostile). The difference between these dissatisfied subjects and the rest of the pinwheel subjects was subjected to Fisher's exact test, and the probability level was found to be 0.050. Conversely, the more satisfied subjects in pinwheel (1.4 or more points above the group SJ average) tended to be low scorers on Factor III. The probability level for this difference, also computed by Fisher's exact test, was below 0.031.

The picture is reversed in circle and governor groups; the dissatisfied subjects were low scorers on Factor III. Specifically, individuals who were more than 1.5 points below the group SJ average were tested against the rest of the circle and governor subjects and the resulting chi-square value of 5.64 was significant beyond the 0.02 level. With the more satisfied subjects in these two networks the difference was not significant, although it was in the proper direction; that is, those more satisfied were more frequently high scorers on Factor III.

In other words, individuals who are dissatisfied in circle and governor are those who tend to see their environment as hostile, whereas those who are dissatisfied in pinwheel do not view their world so. Conversely, those who are above average in job satisfaction in pinwheel are those who see the world as generally hostile. The explanation of this finding probably lies in the fact that the pinwheel network differed from both circle and governor in that no subject could send to the same man from whom he could receive. In both circle and governor, on the other hand, all communication channels

*All contingency tests arraying Factor III scores vs job satisfaction involved two-by-two tables with, on the one hand, "deviants" and "not deviants" and, on the other hand, subjects with scores of zero and those with scores of one or two on Factor III. Subjects scoring one and two were combined in order to get adequate frequencies.

were reciprocal (if A could send to B, B could send to A). If one may speculate, it would seem that the individual who does not conceive his environment to be hostile is more at home in a situation characterized by direct intercommunication with others; whereas the individual who expects a hostile environment is not as likely to be uneasy in a situation where such direct, reciprocal communication is not possible.

Satisfaction with Own Performance (SP). Individuals who deviated in either direction from the average for their group on satisfaction with their own performance (sureness of their own accuracy) were significantly different from the rest of the sample in terms of their scores on Factor II (initiativity).* As above, the nature of the relationship was different in circle and governor from that in pinwheel. But unlike the above situation, where positive deviants tended to be at one extreme and negative deviants at the other extreme on the personality factor, both positive and negative deviants were concentrated at the same extreme, and a second measure was found to differentiate the positive from the negative deviants. To test the difference between the deviants and the rest of the sample, a chi-square was computed for comparing, in terms of their quasi Factor II scores, those circle and governor subjects who deviated at least two points from the group SP average with the other subjects in circle and governor (those who did not so deviate). The resulting value, 4.55, was significant beyond the 0.05 level. The deviants (individuals who were either unusually satisfied or unusually dissatisfied with the adequacy of their answers) were more frequently low scorers on Factor II (not inclined to be initiative-taking) than the rest of the circle-governor subjects.

Similarly, a chi-square was computed for pinwheel subjects who deviated by at least two points. Its value was 4.28, which is also significant beyond the 0.05 level. However, the difference was in the opposite direction. That is, pinwheel deviants were more frequently high scorers on Factor II (inclined to take the initiative).

The data at hand do not yield an explanation of this relationship, but we can speculate upon it. Though the subjects were told the group's total error count, they were given no error count of individual members. Any estimate of their own and fellow members' error levels had to be based on inferences from their message information, and direct interchange could provide them with important cues; for example, being able to exchange questions and answers directly about how particular stimulus labels or names are used. As noted above, a unique characteristic of the pinwheel network is its lack of reciprocal communication. That is, if A can send to B, A cannot receive from B. Thus it may be that more information helpful to such error estimates is available in circle and governor.

It seems reasonable that individuals who are moderately or strongly inclined to be

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*All contingency tests concerned with satisfaction with one's own performance involved two-by-two tables. Subjects were separated into two groups with respect to quasi Factor II scores by combining into one category those with scores of 0, 1, 2, or 3 and into the other category those with scores of 4, 5, or 6. This was done to obtain adequate frequencies.

initiative-taking would actively attempt to make such estimates. It would follow that in circle and governor, where more helpful information was available, the middle and high scorers on "initiativity" would tend to set the average for the group in estimate of performance and would thus be closer to that average, but that the low scorer on "initiativity" would be more likely to differ from the rest of his group. If this reasoning is applied to the case of pinwheel, it would be the high scorer on "initiativity" who would deviate from the average. That is, the individuals who are most inclined to take the initiative would attempt inferences from whatever information is at their disposal, while the more moderate individuals would lean on knowledge of the whole group's performance and make estimates more similar to one another.

There remains the problem of what differentiates the high from the low deviant. It was thought that message output might be important in this connection. In order to test this, the total number of messages sent in a given group was divided by five (the number of members) to get the average individual output in that group. Then it was determined for each deviant whether he fell above or below the average message output for his group. A chi-square was computed, comparing high with low deviants as to whether they were above or below average in message output relative to their group. The resulting value, 3.99, was significant beyond the 0.05 level. Individuals who, compared with their fellow members, were unusually satisfied with (sure of) the accuracy of their performance were more frequently above average in message output; those who were unusually unsure of their performance were more frequently below average in the number of messages they sent.

Satisfaction with the Organization Developed by the Group (SO). Individuals who deviated in either direction from their group SO average were significantly different from the rest of the sample in terms of their quasi scores on Factor IV (self-sufficiency of the individual within his group). Unlike the results for the other two satisfaction measures, the same relationship holds for all three networks. However, like the results with the SP measure, both positive and negative deviants were at the same extreme on the relevant-personality dimension, and a second measure (again message output) differentiated the high from the low deviants.

Specifically, a chi-square was computed for comparing the 63 subjects from all three networks who deviated more than 1.5 points in either direction from their group's SO average with the rest of the sample in terms of their quasi Factor IV scores.* The resulting value was 15.16 which is significant beyond the 0.001 level. The subjects who deviated markedly from their fellow members in terms of reporting satisfaction or dissatisfaction with their group's organization were more frequently high scorers on Factor IV. What this finding may very well reflect is simply that individuals who tend

*In order to obtain adequate frequencies, individuals with quasi scores of 0, 1, 2, or 3 on Factor IV were combined into one group, and those with scores of 4 or 5 were combined into a second group.

to be self-sufficient within a group are able to express relatively more (or less) satisfaction with the group.

The deviant subjects can be distinguished as to whether they were relatively more satisfied or more dissatisfied on the basis of their message output. A chi-square was computed which compared high (more satisfied) deviants with low (more dissatisfied) deviants as to whether they were above or below the average in their group of individual message output. Its value, 4.34, is significant beyond the 0.02 level. Those who were unusually satisfied, relative to their fellow members, with their group's organization were more frequently above average in message output; those who were unusually dissatisfied were more frequently below average in message output.

4. SUMMARY AND CONCLUSIONS

On the basis of 55 individually conducted depth interviews with enlisted Navy personnel, a questionnaire was constructed for measuring several personality and attitudinal factors that were hypothesized to have important effects on behavior in task-oriented groups. The first form of the questionnaire, which consisted of some write-in items requiring the subject to respond in his own words, as well as the usual agree-disagree items, was given to 100 new Army recruits. Analysis of responses to the write-in items and factor analysis of the agree-disagree items clarified the variables that the questionnaire was designed to measure and indicated which factors needed more extensive item coverage. A second form of the questionnaire which incorporated additional items of both types was constructed.

The questionnaire was administered to 360 Army recruits who subsequently served as subjects in an experimental study of noise-reduction in task-oriented groups.

Factor analysis of the responses of these subjects to the agree-disagree items yielded five independent factors that were tentatively interpreted as: affability in work groups (Factor I); initiativity (Factor II); other-confidence (Factor III); self-sufficiency of the individual within the group (Factor IV); and considerateness (Factor V). The relation of these results to the results of other factor analytic studies was indicated. The present interpretations are considered provisional upon the outcome of further research. Additional items should be constructed to measure the factors as now conceived, and responses from a broader population should be obtained and analyzed to determine whether or not the interpretations need modification. Finally, data on the reliability of the questionnaire is needed.

Analysis of the write-in items showed them to be quite amenable to objective scoring. The sentence-completion items, in particular, which require the subject to finish incomplete sentences in his own words, were found to be a further measure of the sociability (affability) dimension. The sentence-completion item, because of its projective-technique aspect in combination with quick, paper-pencil administration, has been considered a potentially valuable research tool; but the lack of objective, reliable, scoring methods has been a drawback. The data of this study indicated, however, that

it is possible to devise meaningful score categories that can be applied with high reliability by independent judges.

In order to obtain some evidence of the usefulness of the questionnaire, certain aspects of the behavior of the subjects in the experiment on "noise reduction" were analyzed in relation to the questionnaire responses of those subjects. These aspects were: the satisfaction of the subjects with their own performance and that of their group; types of communication directed to fellow members; the average number of communications; and the degree of group learning (error reduction). Significant relationships were found between these experimental variables and the personality variables measured by the questionnaire. In view of these findings, the questionnaire may be regarded as a useful instrument.

A fruitful line for further research would be the direct study of the effect of these personality variables on behavior. Studies in which subjects, who have been selected on the basis of their personality characteristics, are observed in experimental situations, would be especially valuable.

Appendix A

QUESTIONNAIRE

Subject ____
Exper No. ____

This is a questionnaire about your attitudes toward various things. THIS IS NOT A TEST. There are no right or wrong answers. We simply want to know how YOU feel about some things. We are not asking for your name or any other identification, so please fill out the questionnaire as honestly as you can.

Your questionnaire will not help us unless you mark every item; so please, DO NOT LEAVE OUT ANY ITEM.

Part I. DIRECTIONS: Please read each of the following statements. If you AGREE with the statement, mark an A on the blank line in front of that statement. If you DISAGREE with the statement, mark a D.

1. __ In a group I usually take the responsibility for getting people introduced.
2. __ There will always be wars because basic human nature is aggressive and self-assertive.
3. __ I would be a good leader of people.
4. __ I would rather spend my free time going to the movies or watching TV than relaxing and talking with friends.
5. __ Friendship is one of the most important things in life.
6. __ I usually have to stop and think before I act, even in small matters.
7. __ When I'm in a new group that's not yet organized, I pitch in and get things moving.
8. __ The guys in a group should be just acquaintances because if they are good pals, someone always favors someone else.
9. __ I do not have as much drive and energy as other people seem to have.
10. __ People often turn to me when decisions have to be made.
11. __ I do not like to have responsibility for other people.
12. __ When I'm doing a job, I prefer to work alone.
13. __ One soon learns to expect very little of others.
14. __ If I'm in a group that is just getting started, I usually wait and see how it will get organized before finding my own place in it.
15. __ The really important things that happen to us were meant to be that way.
16. __ If I had my choice, I would always prefer to work in a group rather than by myself.
17. __ I hate to have to tell others what to do.
18. __ I have more trouble concentrating than other people seem to have.
19. __ I like to be the leader in a group only when I know the job better than anyone else.
20. __ In general, groups are inefficient and should be used only if the job requires it.
21. __ I always see what others think before I take a stand.
22. __ I can't get as much done in a group as by myself because you're always taking time out to talk and joke.
23. __ When I first get into a group, I usually sit back and watch the others.
24. __ Present-day charitable policies in government tend to weaken the individual's initiative.

25. __ When I'm in a group, I'd rather be just one of the guys on the job than be the leader.

26. __ Whatever job I'm doing, I like to work in a place where there are other people around.

27. __ I enjoy having the responsibility for showing others the best way to do the job.

28. __ In a group I try to keep up with the next guy and don't take time out to smoke or read a paper, so I usually get more done in a group than alone.

29. __ I get more done by myself because there's nothing else to do but work.

30. __ In the groups I work in, I like to have a position of responsibility.

Part II. DIRECTIONS: Each of the following items is an incomplete sentence followed by a blank line. On each line you are to write something to complete each sentence. Don't worry about spelling or grammar. Just write down the FIRST THING YOU THINK OF to finish the sentence -- no matter how silly or strange it may seem to you.

When I'm in a group, I usually _____.

Groups nearly always _____.

The members of a group should never _____.

In most groups you find _____.

I think that groups _____.

Appendix B

SCORE CATEGORIES FOR SENTENCE-COMPLETION WRITE-IN ITEMS

There are four sentence-completion items to be judged. The item that begins "The members of a group should never" is to be omitted. You may read this item, however, if you need additional context for judging the meaning of phrases given in response to the other items. Each of the other four items will receive a score of plus, zero, or minus. If one of the items is left blank (there are only a few such cases) it automatically receives a score of zero. The basis for the score categories is the type of response. Although a given type usually occurs with a particular sentence-completion item, it does not always do so. You are to score by type. This will become clear as you read through the descriptions of the categories.

After you have become familiar with the scoring categories, you may begin to judge in the following way. Read the respondent's completion of the first item. Consult the description of the type of response usually given to that item. If it fits, decide whether plus, zero, or minus is the appropriate score and record it. If the response you are judging does not fit into that type, read over the other types and decide where it does fit. Then decide and record the appropriate score. Next, read and judge the second response. Be sure to judge each response of each subject separately. This means that the score categories should be carefully consulted each time you judge a response.

The following type of response is usually given to the item that begins "When I'm in a group I usually." Whenever it occurs, score as follows:

Plus: Any expression of pleasant feeling, such as: "I usually have fun or enjoy myself." "Like to talk." "Talk with everyone." "Like it better." "Make friends." The pleasant feeling may be related to work, such as: "I pitch in." "I help." "I get things moving." "I take part." "I like to see everything on the ball." "I try to do my best." "I try to reach the top." "I try to lead or organize." "I do a better job." "I try to find out the group's purpose."

Zero: Any neutral response, such as: "I do my share" (with the implication of not pitching in, but of doing merely what is required). "I do what everyone else is doing." "I sing or whistle." "I (just plain) talk." (If the "talk" implies enjoyment or that the group has something in common to talk about, this obviously has a pleasant overtone and, see above, is scored plus.) "I pay attention." " I like my presence known." In short, any response that has no definite negative or positive cast.

Minus: Any expression of unpleasant feeling or restraint.

1. Restraint: The main characteristic of such responses is that they indicate the respondent sits back, watching and waiting. Hatred of group is not necessarily implied, but some restraint or passivity or defensiveness is indicated. Examples: "I feel bashful." "I mind my own business." "I look

it over, or look the people over." "I find out what the others are like or how they feel."

2. Overtly unpleasant feeling expressed. Examples: "I want to leave." "I don't do as much work." "I don't work as well."

The following type of response is usually given to the item that begins "Groups nearly always." Whenever it occurs, score as follows:

Plus: Any generally pleasant or laudatory statement about groups and what one finds in them. For example: "are fun," "are good," "are efficient," "do more work," "keep up morale," "have things in common," "are a good way to do things," or "are necessary to our way of life."

Zero: Any neutral statement, such as: "are organizations," "have a leader," "depend on individuals or are composed of them," "work well only as each individual works," "are growing," "are large," or "are small," "are an interesting study," "have something to do" (if meant in neutral sense and not in positive sense of having things in common).

In a few cases the response has both positive and negative overtones; e. g. "groups take time to do what they want." In such cases the net effect is neutral and the response is scored here.

Minus: Anything that has an unpleasant or blaming overtone, such as: "stink," "are bad," "are not for me," "fight," "are inefficient." If there is an implication that groups have to be "watched" or "kept in line," consider this a negative tone and score here.

The type of response that names a particular kind of person to be found in groups is usually given to the item that begins "In most groups you find," though it may be given to any of the other items. Score as follows:

Plus: "Friends." "Buddies." "Good guys." "A good leader." "A natural or born leader." "An outstanding personality." In other words, if the kind of person mentioned is favorable, the item gets a plus.

Zero: Anything that is neutral gets a zero, such as: "People." "All kinds." "People that are different." "Good and bad." "Leaders and followers." In short, anything that has neither a negative or positive overtone.

Minus: "Wiseguys," "troublemakers," "soreheads," "a bad apple." "Someone who wants to be boss or to run things." In short, any kind of person who is unpleasantly characterized.

The following two types of response are usually given to the item that begins "I think that groups." Whenever they occur, score as follows:

Plus: Any response that implicitly accepts the existence of the group and then overtly advises some course of behavior for the group is a positive response. For example: "should stick together," "should be well organized," "should cooperate," "should work together." In short, any response that begins with "should" and then tells how the group should go about

doing something.

Zero: There are a few neutrals of this form: "should" responses that do not imply basic acceptance of the group; for example, "should get more organized."

The conditional type of response that is given in the form of some proposition about groups that is only conditionally true, i.e. is followed by "if," "when," "but," and the like.

Plus: If the first part of the statement is favorable ("work better," "are good," etc.) and is followed by "when," score the response plus. For example: "groups get more done when they have cooperation, or training, or a good leader." In some cases, "but" may be substituted for "when," as in: "groups are good but should be run well," which is really equivalent to "groups are good when they are run well."

Zero: If the favorable proposition is qualified by "most of the time" or "in most cases," the response is scored zero. For example: "groups are good most of the time."

Minus: If the favorable statement or proposition about groups is followed by "if," it is to be scored minus. The implication here is that the favorable proposition does not hold very frequently. For example: "groups are OK if they are run right." Also, those few cases in which the preliminary statement is unfavorable, even though it is followed by "when," are scored minus. For example: "groups are bad when they are not run right."

Another negative (minus) form is any response in which the respondent limits the group to certain places, jobs, or people only. For example: "groups are OK sometimes," "groups are OK on some jobs or for some people, or when one man can't do it alone."

Appendix C

SCORE CATEGORIES FOR TROUBLEMAKER WRITE-IN ITEM

The responses that you are to judge are in the form of answers to the question, "What would you do if you were working in a group and there was a troublemaker in it who was causing difficulty?" Read over each respondent's solution (answer) and then compare it with each category described below. Decide which category comes closest to describing the particular solution (answer) you are judging. Then record the letter of that category and the numerical score as your judgment of the respondent's answer. Leave the most difficult judgments for the last. They will be easier to judge after you have become well acquainted with the score categories.

The following categories (A, B, C) receive a score of zero.

Category A: This solution is to avoid, stay away from, ignore the troublemaker. It is a passive, leave-me-alone, don't-bother-me attitude. It involves a mind-my-own-business and leave-troublemaker-alone approach as well. In the extreme case, this takes the form of leaving the group.

Category B: Any solution that starts out "I and the group" or "We" or "I'd get together with the other guys" or "I'd take a vote of the guys" is placed in this category. It does not matter what the group is then going to do, whether it is harsh or harmonious. It is classified here if the respondent indicates that he will not act alone. Any solution that involves finding out what the other men think fits here. In other words, the respondent will not act alone.

Category C: This category is small, rather neutral and uninformative. It includes two kinds of solutions: (1) the respondent merely states that he would talk to the troublemaker without indicating what he would say or whether it would be pleasantly or aggressively toned; and (2) the respondent simply states that he would make the troublemaker change, without any indication of how this would be accomplished.

The following categories (D, E, F) receive a score of one.

Category D: This category includes some action of an unpleasant nature directed toward the troublemaker, varying from just "telling him off" to the use of physical force. Examples are: telling him "to shut up," "to cut it out," "telling him off," and so on. Any solution that requires direct physical action (e.g. "beating him up") or the threat of it (e.g. "I'd get him alone and straighten him out any way I could") is categorized here.

This category also includes unpleasant solutions of a nature intermediate between hitting and just telling him to cut it out. For example, making remarks designed to make the troublemaker feel ashamed, or silly, or uncomfortable, -- in general "putting him in his place." Also, "keeping an eye on him" implies suspicion or mistrust.

Category E: This category includes solutions that require punishment of the troublemaker or having him reported to his superior. Examples of punishments are: assigning to the troublemaker the worst jobs, such as KP duty, or generally making it hard for him. The "report him" solution includes both a direct report about the troublemaker by the respondent and also an indirect report; for example, "have him reported" or "the leader should be told about it."

Category F: This is the "change or leave" category. Usually this involves telling the troublemaker to "wise up or get out." It also includes solutions in which the respondent says in effect: "either I'd straighten him out or throw him out." Another example is "have him change or get out." In general, this category requires an "either-or" (either he changes or he is replaced) state of affairs.

The following categories (G, H) receive a score of two.

Category G: The solutions scored here involve elimination of the troublemaker. For example: "fire him," "have him kicked out," "tell him to leave." Even if the solution is softened ("try to have him removed" or "drop him" or "send him to another group"), score it in this category.

Category H: This is a "pleasant" category in contrast to category D, which involves "unpleasant-to-the-troublemaker" solutions. In general it requires a solution that corrects the problem in a peaceful, harmonious, or constructive way. For example, it includes:

1. "Try to reason with him." "Try to explain his error to him." "Try to make him understand." (In some cases the respondent may say that he will try to help the troublemaker correct his error; but note the difference between this and category K where the help involves trying to see the troublemaker's side of the problem.)

2. "Talk to him in a friendly way." "Try to straighten him out" if the implication is one of doing it pleasantly and without hurting him.

3. "Just be friendly or try to get around him nicely."

The following categories (K, M) receive a score of three.

Category K: This category includes two kinds of solutions: (1) any solution that involves an attempt to find out what is bothering the troublemaker or what the real situation is; and (2) any solution that requires the respondent to take aside the troublemaker and talk to him in a friendly way.

Category M: This category also includes two kinds of responses: (1) "Segregate or isolate the troublemaker and have him work by himself." (This does not mean "leave him alone" as in category A. It has to involve some intent on the part of the respondent to arrange for the troublemaker to work alone.) (2) "Explain the group objective or purpose to the troublemaker." (Interpret this literally. An explanation to

the troublemaker that the group has a job to do or that he is hurting the group is not enough.)

Note on Judging Answers with More Than One Solution. If there are two solutions offered in a single answer (provided they are not of the "either-or," category F, type) score according to the first solution given and ignore any others. If the first solution is of the uninformative, category D, type ("I'd talk to him") score according to the second, more informative, solution.

BIBLIOGRAPHY

1. G. W. Allport, P. E. Vernon, A Study of Values (Houghton Mifflin, Boston, 1931).
2. H. E. Brogden, The Primary Personal Values Measured by the Allport-Vernon Test: A Study of Values, Psychol. Monogr. 66, Whole No. 348 (1952).
3. N. Cameron, A study of thinking in senile deterioration and schizophrenic disorganization, Amer. J. Psychol. 51, 650-664 (1938).
4. N. Cameron, A. Magaret, Experimental studies in thinking: I. Scattered speech in the responses of normal subjects to incomplete sentences, J. Exp. Psychol. 39, 617-627 (1949).
5. L. S. Christie, R. D. Luce, J. Macy, Jr., Communication and Learning in Task-Oriented Groups, Technical Report No. 231 (Research Laboratory of Electronics, M.I.T., May 1952).
6. E. A. Fleishman, The description of supervisory behavior, J. Appl. Psychol. 37, 1-6 (1953).
7. N. T. Fouriezos, M. L. Hutt, H. Guetzkow, Measurement of self-oriented needs in discussion groups, J. Abnorm. Soc. Psychol. 45, 682-690 (1950).
8. H. G. Gough, H. McClosky, P. E. Meehl, A personality scale for dominance, J. Abnorm. Soc. Psychol. 46, 360-366 (1951).
9. J. P. Guilford, R. B. Guilford, Personality factors S, E, and M, and their measurement, J. Psychol. 2, 109-127 (1936).
10. H. J. Leavitt, Some effects of certain communication patterns on group performance, J. Abnorm. Soc. Psychol. 46, 38-50 (1951).
11. A. H. Maslow, The authoritarian character structure, J. Soc. Psychol., Society for the Psychological Studies of Social Issues Bull. 18, 401-411 (1943).
12. E. L. Phillips, Attitudes toward self and others: A brief questionnaire report, J. Consult. Psychol. 15, 79-81 (1951).
13. A. R. Rohde, Explorations in personality by the sentence completion method, J. Appl. Psychol. 30, 169-181 (1946).
14. P. M. Symonds, The sentence completion test as a projective technique, J. Abnorm. Soc. Psychol. 42, 320-329 (1947).