THE ASSOCIATION BETWEEN PERCEPTIONS OF DAILY EXPERIENCES AND SE-ETC(U)

UNCLASSIFIED 81-2

END

A-81

ETC
The Association Between Perceptions of Daily Experiences and Self- and Spouse-Rated Mood

Arthur A. Stone
Long Island Research Institute
and
Department of Psychiatry and Behavioral Science
State University of New York at Stony Brook

Technical Report
Approved for Public Release

Prepared for:
OFFICE OF NAVAL RESEARCH
800 North Quincy Street
Arlington, Virginia 22217

DISTRIBUTION STATEMENT A
Approved for public release;
Distribution Unlimited

Reproduction in whole or in part is permitted for any purpose of the United States Government
A recent study by Rehm (1978) reported strong associations between the daily report of pleasant and unpleasant events and a global mood rating. This study examined desirable and undesirable events in an effort to replicate and extend Rehm's work by having 26 married couples complete a daily event and mood checklist about husbands for 14 consecutive days. The group averaging strategy generally used to describe event-mood correlations was compared to a tabulation of significant individual correlations. The observed correlations...
were consistent with a previous study of pleasant events by Lewinsohn and Graf (1973) and a study of unpleasant events by Lewinsohn and Talkington (1979), yet were considerably smaller than those reported by Rehm. Wives' ratings of their husbands' mood revealed the same relationships with experiences as did husbands' self-rated mood. Differences in the populations studied and the event and mood assessments between our study and Rehm's could account for this finding. A tabulation approach to the data showed that few subjects actually achieved statistically significant associations in contrast to the group approach which indicated small associations across all subjects.
The Association Between Perceptions of Daily Experiences and Self- and Spouse-Rated Mood

Arthur A. Stone
Long Island Research Institute

and

Department of Psychiatry and Behavioral Science
State University of New York at Stony Brook

Running Head: Daily Experience and Mood
Lewinsohn and his colleagues have shown that experiencing pleasant events is associated with self-report of daily mood (Lewinsohn & Graf, 1973; Lewinsohn & Libet, 1971). Participants in one study completed the Pleasant Events Schedule (PES), a checklist of pleasant experiences modified for usage with community participants (Lewinsohn & Libet, 1972), and the Depression Adjective Checklist (Lubin, 1965) for 30 consecutive days. A -.25 correlation was observed between the daily report of number of pleasant events and the depressed mood scale. This finding confirmed similar relationships observed when PES and mood data had been collected in cross-sectional studies (Lewinsohn & Libet, 1972; MacPhillamy & Lewinsohn, 1974). The data have been interpreted by Lewinsohn and his colleagues as supportive of his well-known reinforcement theory of depression (Lewinsohn, 1974).

Until recently, however, the effects of unpleasant events on mood had not been examined. Unpleasantness may be a particularly important quality of daily experience given the findings that unpleasant life events consistently relate to both physical and psychiatric dysfunction (Dohrenwend & Dohrenwend, 1974; Johnson & Sarasen, 1978; Mueller, Edwards & Yarvis, 1977; Vinokur & Seltzer, 1975). Rehm (1978) has recently reported studies which did include both pleasant and unpleasant events as predictors of daily mood. College students rated their mood with a ten-point scale (0 = worst mood ever, 10 = best mood ever) and recorded pleasant and unpleasant events in
diary format for 14 days. Correlations averaged over individuals were substantial: .65 and -.36 for the frequency of pleasant and unpleasant events with mood, respectively, in the first study and .51 and -.35 in a replication. Multiple correlations using both pleasant and unpleasant events as predictors yielded values of .70 in both studies. Lewinsohn and Talkington (1979) have also shown that unpleasant events, as assessed with their daily Unpleasant Events Schedule, are associated with Depression Adjective Checklist scores. Over a 30 day reporting period, depressives and control subjects had an average correlation of .29 between unpleasant events and mood scores.

Rehm's (1978) finding that 49% of mood variation was attributable to all events and that 34% was attributable to pleasant events alone is impressive, especially in light of the relatively small percentage of variation that Lewinsohn and Graf (1973) predicted using pleasant events (6%) and that Lewinsohn and Talkington (1979) predicted using unpleasant events (8%).

The present study was an attempt to gather further data on the relationship between daily experience and mood. Methodological refinements in the design of the study and in the instrumentation used for data collection were instituted to provide a more accurate estimate of the relationship between experience and mood. Specifically, a demographically heterogeneous sample of community participants was used to avoid possibly biased results from young, well-educated college students as used in Rehm's study. Checklist methods were used to collect both experience and mood data. These were chosen over diary-type and global rating methods because the presentation of standardized stimuli, inherent in the checklist method,
appears desirable given that the research materials are self-administered and the phenomena measured are complex (Masterson, 1975). The unipolar quality of "desirability/undesirability," which at face value is very similar to the "pleasantness/unpleasantness" quality used in Rehm's and Lewinsohn's work, was used to rate reported events. Mood was assessed with the Nowlis Mood Adjective Checklist (Nowlis, 1965) which provides 12 mood scales based on four-point ratings of 36 adjectives. Finally, unlike other studies which relied solely on self-assessment of mood, this study extended mood measurement to include spouses' ratings of target individuals' moods. Target individuals' event reports could then be correlated with spouse-rated mood, extending the analysis from solely self-report with the possibility of an association between measures due to rater response sets, to observer-report of mood.

Another issue explored in this paper is the method which has been used to analyze daily event and mood data. Typically, correlations have been computed for each subject across days. Tests of significance based on the mean and standard error of the correlations are then computed for the entire group, having first been transformed to Fisher's Zs. The shortcoming of this method is that it is unclear whether or not a significant association between experience and mood for any individual has been achieved because individual correlations are not tested for significance. An appropriate significance test for individuals is based on the number of days used in the calculation of the coefficient. Thus, averaging individuals' correlations combines usually the information about nonsignificant and significant correlations. It is possible with the usual method to have an overall significant group
correlation, as tested with a t-test based on the mean and standard error of the individual correlations, when no individual coefficient is significant. This paper will compare results when the data are subjected to this analysis and to a tabulation of significant and nonsignificant individual correlations.

Method

Subjects. Married couples were solicited from local communities with both mailings to addresses randomly selected from the county telephone directory and advertisement in local newspapers. Payment of $20 for participation was offered. Thirty-two couples were mailed questionnaires and 26 were returned and properly completed. The average age of male participants was 38 (range: 29-54). The median education category of males was 1-3 years of college and approximately equal thirds were in social classes I-II, III, and IV-V on the Hollingshead Two Factor Index of Social Position. Median household income was $19,000. Despite the voluntary nature of the subject selection, these statistics correspond extremely well to equivalent statistics from the Census for the areas from which subjects came. Thus, although representativeness was not a consideration in subject selection, on the variables measured participants do reflect the relatively broad range of variability inherent in the generally middle class suburb in which they live.

Procedure. Several months prior to the daily recording period, couples completed a battery of questionnaires. During the two week recording period, a daily events checklist and the Howls Mood Adjective Checklist (the short version modified so that ratings were for the entire day) were completed by husbands about themselves and were completed by wives about their husbands.
The checklist consisted of 66 event categories representing a distillation of a large pool of daily events collected from another group of couples who had recorded "important" and "emotionally- laden" events for two weeks (Stone, 1978). This event checklist was comprised of 20 headings and subheadings specifying general content areas: the six major headings were work-related activities, leisure activities, financial activities, family and friends, other happenings, and write-in, for events which were viewed as significant, yet were not included on the checklist. Checked events were rated in spaces opposite the items on two bipolar dimensions with 14-point adjective-anchored scales (desirability/undesirability and changing/stabilizing) and on one 7-point unipolar scale (meaningfulness). These three dimensions were obtained from a factor analysis of six event qualities related to the concept "stress" (Redfield & Stone, 1979). Husbands were instructed to complete the form about themselves and wives about their husbands independently of one another at the end of the day for two weeks. Both forms were mailed the next morning to encourage daily completion (Stone, 1978).

Results

The average number of days couples completed the forms was 13.2 (range: 7-14) and husbands recorded an average of 5.9 events per day. For the remainder of this paper an event is called desirable or undesirable according to which side of the desirability/undesirability scale the husband used, following the approach of Rehm (1978) and Lewinsohn and Graf (1973), no distinction was made concerning the degree of rated desirability. Thus, the resulting sums of daily events are similar to the sums of pleasant and unpleasant events used in the previously cited daily mood studies. The means
and standard deviations for the event and mood data presented in Table 1 were calculated by averaging individuals' means and standard deviations, which are based on daily reports. Desirable events were reported 2-1/2 times as often as undesirable events.

To facilitate interpretation and analysis of the mood data, the 12 Nowlis mood scales were factored allowing a smaller number of factor scores to represent mood in the correlational analyses. Males' and females' mood scale scores (N=346 days) were submitted to principal component analysis followed by orthogonal rotation (varimax). Three factors with eigenvalues greater than unity were derived for both males and females accounting for 60% and 57% of the total mood variation, respectively. Factor loadings of the 12 scales on the male and female factors are presented in Table 2.

The pattern of loadings is similar for both sexes. Factor 1 is comprised of skepticism, aggression, anxiety, concentration, and sadness, and additionally of egotism for females only. We label this factor Negative Engagement (NE) given its negative - cd and its action component (i.e., aggression, concentration). Conversely, Factor 2 is called Positive Engagement (PE) because of the high loadings on surgency, elation and social affection, and additionally of warmth and egotism for males only, indicative of positive mood, while the loading of vigor gets at the engagement component. The third factor accounts for roughly 10% of mood's variation, half
As soCi a ti!on tEE:WEen Perceptions Ca
cat4,; FrCV71C'US t.v.o-ac c-c-Erc, T&Z Cie
do5 S'I'C'E

As some of the work cited in the introduction of the paper used depressed mood as the outcome, we have also included the Sadness scale in some of the forthcoming analyses. This was done in spite of the fact that Sadness loaded .77 on NE because it was still possible that NE would not adequately represent the scale.

Our first analysis followed the method used by Rehm (1976): correlations between husband-rated and wife-rated mood (the three factors and Sadness scale) and the number of desirable and undesirable events reported by husbands were computed for each couple across their daily reports for the two week reporting period. The 26 sets of correlation coefficients, a set of each couple, were transformed to Fisher Zs to normalize their typically skewed distributions for statistical testing (Cohen & Cohen, 1975). Mean correlations over couples were computed by averaging the Fisher Zs and transforming the resulting means back to correlations. These mean correlations are presented in Table 3 with the results of t-tests for significant deviation from zero. It should be noted that the average correlation between the number of desirable and undesirable events was .01 for the males. As can be seen from the table the direction of these mean coefficients is consistent with expectations from previous research. Namely,
Sadness was directly related to undesirable experiences ($t(25)=3.69$, $p<.01$) while PE was related inversely to undesirable experiences ($t(25)=-.42$, $p<.01$) and directly to desirable experiences ($t(25)=4.29$, $p<.01$). Apathy was not reliably associated with either experience. Furthermore, both the Sadness scale and the NE Factor had the same pattern of significance with events: Sadness was directly related to undesirable events ($t(25)=3.69$, $p<.01$) and not related to desirable events. Compared to NE, Sadness was less strongly related to events. The patterns of significant relationships were identical when wife (observer)-rated moods were correlated with husband (target)-reported experiences: NE with undesirable experiences ($t(25)=3.86$); PE with undesirable experiences ($t(25)=2.85$); PE with desirable experiences, ($t(25)=5.51$); and, Sadness with undesirable experiences ($t(25)=2.08$).

In contrast to the previous analysis which did not examine individual correlation coefficients, our second analysis tested individuals' coefficients with critical values based on the number of paired observations for each coefficient. Given the comparability of the results with NE and Sadness demonstrated in the previous analysis and Sadness's moderate factor loading on NE, we felt that Sadness would be adequately represented by NE, and only the need factors are considered hereafter. The critical value at the .05 level of significance for a correlation with 14 observations required an absolute value equal to or greater than .60; for the couple with only 7 observations, the critical value was .76. Because only three subjects had fewer than 14 observations and only one subject had fewer than ten, we felt the differential criteria for significance would not adversely affect the results. Indeed, the criteria for significance are stringent given the relatively low power of the tests. Correlations between events and need factors for all couples are found in Table A.
A simple tabulation of the number of individuals achieving significant correlations between events and mood factors allows a direct comparison of this analytic method to the previous one. Additionally, with the tabulation analysis, both positive and negative correlations may be presented separately whereas in the previous analysis the signs of the correlations were obscured by the averaging procedure. Table 5 presents a summary of the number of individuals with significant correlations according to event class and sign of correlation for the three mood factors. The cells of this table corresponding to the significant relationships found in the previous analysis, i.e., desirable events with PE and undesirable events with NE and PE for males and females, are notable because they have either all negative or all positive significant correlations. The remaining cells have either combinations of both positive and negative significant correlations or few significant correlations. The strongest event-mood relationship had 10 of 26 (38%) individual correlations significant (desirable events with PE for females). Overall, the average number of significant individual correlations for those event-mood relationships reaching significance in the analysis was 5.5 (21%), a surprisingly small proportion.

It is possible that while neither desirable nor undesirable experiences taken alone could not predict mood scores, both types of experiences taken together might predict. To test this hypothesis, a set of multiple correlations were run. Desirable and undesirable experiences were used to simultaneously predict each of the six mood factor scores for each couple.
The multiple correlations for couples are presented in Table 5. Statistically, the multiple correlation must be at least as large as the larger of the two individual correlations with the mood scales and, because there are two predictors, the multiple correlation will usually be greater than the larger simple correlation. Our way of comparing whether the dual predictor strategy was better than single correlations at predicting mood factor scores was to examine the levels of significance of the regressions. Looking at significant regressions only takes into account the fact that two predictors are being used, and that they should account for more mood variation than by chance alone, by testing the multiple correlations with fewer degrees of freedom. If there are many instances when the regression strategy is significant, yet neither of the simple correlations are, then we would conclude that the multiple predictor strategy does a better job at accounting for mood variation. Tabulations of significant correlations from Table 4 reveal that: 19 times one or both of the simple correlations was significant, yet regression was not; 23 times one or both of the simple correlations was significant and the regression was significant; and, only once were both of the simple correlations nonsignificant and the regression significant.

Discussion

The summarization of the 36 Nowlis mood adjectives with principal components analysis yielded three readily interpretable factors accounting for approximately 60% of the variance. The factor structure was quite similar for husbands' ratings of their own mood and wives' ratings of their husbands' mood. The correlations observed are comparable in magnitude to those Lewinscn and Graf (1973) and Lewinscn and Tellingston (1979) found. Of the three Nowlis mood factors, only Positive and Negative Engagement had any relationship
to the report of daily experiences using analytic methods identical to those previously reported in the literature. Moreover, the relationships were not dependent on whether mood was self- or other-rated; the pattern of correlations was the same for both views of the targets' (husbands) daily mood. They do, however, fall far short of the strong relationships reported by Rehm (1978). Pleasant experiences in Rehm's study accounted for 34% of mood's variation, while desirable events in this study explained at most 12% of the variance.

With the averaging analysis, Negative Engagement was shown to be directly related to undesirable events, while Positive Engagement was directly related to desirable events and inversely related to undesirable events. The tabulation of significant individual correlations also demonstrated that PE was related to both desirable and undesirable events, and that NE was related only to undesirable events. For males, both the magnitude of the correlations and the number of significant individual correlations were similar for the significant relationships between mood and both types of events. For females, however, desirable events had a stronger relationship with PE than did undesirable events; this was also seen in the tabular analysis. Thus, a consistent finding for both males and females was that undesirable events were related to positive and negative mood factors, while desirable events were related only to the positive mood factor. The strengths of these relationships were generally comparable, although for females positive mood was related more strongly to desirable events than to undesirable events.

The similar findings of Lewinschn's studies and this study, all of which used similar study designs, suggests that the methodological differences between these studies and Rehm's study explain Rehm's strong event-mood correlations. The free format recording and simple mood assessment used by
Rehm seems particularly prone to bias given the temporal proximity of event and mood recording. This bias was probably reduced with the more complex event and mood assessments used by this study and Lewinsohn's studies. Furthermore, telephone interviews conducted after this study revealed that none of the participants suspected that we were investigating the event and mood association lessening the possibility that the results are biased in favor of detecting a relationship. The target-observer procedure lead most couples to believe we were studying marital communications.

Analysis of the significance levels of the individual correlation coefficients observed on the three mood factors provided a somewhat different view of the same data - only a small proportion of the sample had actually achieved significant associations. At best, 33% of the target individuals had reliable correlations on any of the mood factors and on the average only 5.5% of the sample had significant correlations on each factor.

A regression approach to the data, wherein both desirable and undesirable experiences were used to predict mood, demonstrated fewer significant relationships compared with the simple correlations. This suggests that mood was related strongly to either desirable or undesirable experiences, and that there was not an addictive effect of both types of experiences. It should be kept in mind, however, that with only 14 observations the test's statistical power, i.e., probability of achieving significance, was not great. Nevertheless, this ipsative approach implies that the association may be valid for only a small proportion of subjects, while the nomothetic approach implies a small association for most subjects.

The observed associations between events and mood are not meant to imply that event experience results in affect states. Although this is a plausible
hypothesis, no data have been presented which rule out several alternative hypothesises such as mood-producing events or, as Coyne (1976) has suggested, a reciprocal process involving both events and mood mutually influencing each other over time. In lieu of experimental studies, a much closer analysis of the temporal relationships between mood and events, involving many measurements, has the potential of clarifying the causal issue.
References


Footnotes

The author thanks John M. Neale and Maurice S. Satin for comments on early drafts of this paper. This research was partially supported by the Office of Naval Research. Reprints requests should be sent to Arthur A. Stone, Long Island Research Institute, Health Sciences Center, 7-10, Stony Brook, New York 11794.

Data from the dimensions changing/stabilizing and meaningfulness and from a symptom checklist, which was also completed by participants, was not analyzed here as the focus of this paper was desirability and undesirability of events and their relationship to mood.
Table 2

Variables Marking Rotated Mood Factors For Males' and Females' Reporting About Males' Moods

<table>
<thead>
<tr>
<th>Nowlis Mood Scales</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Skepticism</td>
<td>.79</td>
<td>.72</td>
</tr>
<tr>
<td>Aggression</td>
<td>.79</td>
<td>.71</td>
</tr>
<tr>
<td>Anxiety</td>
<td>.79</td>
<td>.71</td>
</tr>
<tr>
<td>Sadness</td>
<td>.77</td>
<td>.58</td>
</tr>
<tr>
<td>Surgency</td>
<td>.83</td>
<td>.82</td>
</tr>
<tr>
<td>Elation</td>
<td>.79</td>
<td>.82</td>
</tr>
<tr>
<td>Social Affection</td>
<td>.78</td>
<td>.74</td>
</tr>
<tr>
<td>Egotism</td>
<td>.45</td>
<td>.64</td>
</tr>
<tr>
<td>Nonchalance</td>
<td>.42</td>
<td>.65</td>
</tr>
<tr>
<td>Vigor</td>
<td>.57</td>
<td>-.61</td>
</tr>
<tr>
<td>Fatigue</td>
<td>.59</td>
<td></td>
</tr>
<tr>
<td>Concentration</td>
<td>.53</td>
<td>-.54</td>
</tr>
</tbody>
</table>

Variance Explained  25.5  22.3  12.1  23.3  23.6  9.7

Note. Factor loadings between -.40 and +.40 are omitted.
### Table 3

Correlations Among the Daily Frequency of Desirable and Undesirable Events and Husband and Wife-Rated Mood Factors

<table>
<thead>
<tr>
<th></th>
<th>Males (Targets)</th>
<th>Females (Observers)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Negative Engagement</td>
<td>Positive Engagement</td>
</tr>
<tr>
<td>Desirable Events</td>
<td>-.09</td>
<td>.26**</td>
</tr>
<tr>
<td>Undesirable Events</td>
<td>.32**</td>
<td>-.24**</td>
</tr>
</tbody>
</table>

* p < .05  
** p < .01
## Table 4

### Individual Correlations Between Daily Report of Events and Mood Factors

<table>
<thead>
<tr>
<th>Subject</th>
<th>MALES</th>
<th></th>
<th>FEMALES</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NE</td>
<td>PE</td>
<td>A</td>
<td>NE</td>
<td>PE</td>
</tr>
<tr>
<td>D</td>
<td>C</td>
<td>R</td>
<td>D</td>
<td>C</td>
<td>R</td>
</tr>
<tr>
<td>14</td>
<td>-42</td>
<td>43</td>
<td>48</td>
<td>77</td>
<td>-32</td>
</tr>
<tr>
<td>14</td>
<td>-42</td>
<td>43</td>
<td>48</td>
<td>77</td>
<td>-32</td>
</tr>
<tr>
<td>14</td>
<td>00</td>
<td>25</td>
<td>25</td>
<td>46</td>
<td>-59</td>
</tr>
<tr>
<td>14</td>
<td>-30</td>
<td>09</td>
<td>30</td>
<td>28</td>
<td>-20</td>
</tr>
<tr>
<td>14</td>
<td>-20</td>
<td>32</td>
<td>34</td>
<td>40</td>
<td>-20</td>
</tr>
<tr>
<td>14</td>
<td>-40</td>
<td>77</td>
<td>65</td>
<td>46</td>
<td>-62</td>
</tr>
<tr>
<td>14</td>
<td>-10</td>
<td>56</td>
<td>56</td>
<td>44</td>
<td>-57</td>
</tr>
<tr>
<td>13</td>
<td>06</td>
<td>50</td>
<td>51</td>
<td>66</td>
<td>05</td>
</tr>
<tr>
<td>13</td>
<td>03</td>
<td>67</td>
<td>69</td>
<td>21</td>
<td>-06</td>
</tr>
<tr>
<td>13</td>
<td>-05</td>
<td>32</td>
<td>32</td>
<td>65</td>
<td>03</td>
</tr>
<tr>
<td>14</td>
<td>-13</td>
<td>26</td>
<td>26</td>
<td>-03</td>
<td>-37</td>
</tr>
<tr>
<td>7</td>
<td>06</td>
<td>-09</td>
<td>29</td>
<td>05</td>
<td>31</td>
</tr>
<tr>
<td>14</td>
<td>-19</td>
<td>35</td>
<td>41</td>
<td>49</td>
<td>-59</td>
</tr>
<tr>
<td>11</td>
<td>-11</td>
<td>-02</td>
<td>13</td>
<td>-26</td>
<td>-03</td>
</tr>
<tr>
<td>10</td>
<td>22</td>
<td>39</td>
<td>39</td>
<td>06</td>
<td>-10</td>
</tr>
<tr>
<td>14</td>
<td>15</td>
<td>50</td>
<td>55</td>
<td>-17</td>
<td>-25</td>
</tr>
<tr>
<td>14</td>
<td>19</td>
<td>33</td>
<td>63</td>
<td>40</td>
<td>01</td>
</tr>
<tr>
<td>13</td>
<td>-17</td>
<td>40</td>
<td>40</td>
<td>56</td>
<td>-22</td>
</tr>
<tr>
<td>14</td>
<td>06</td>
<td>41</td>
<td>41</td>
<td>26</td>
<td>-46</td>
</tr>
<tr>
<td>14</td>
<td>-16</td>
<td>16</td>
<td>25</td>
<td>33</td>
<td>-02</td>
</tr>
<tr>
<td>14</td>
<td>-36</td>
<td>10</td>
<td>59</td>
<td>14</td>
<td>-42</td>
</tr>
<tr>
<td>14</td>
<td>-36</td>
<td>10</td>
<td>37</td>
<td>-01</td>
<td>-27</td>
</tr>
<tr>
<td>13</td>
<td>-15</td>
<td>37</td>
<td>37</td>
<td>12</td>
<td>-15</td>
</tr>
<tr>
<td>14</td>
<td>-02</td>
<td>42</td>
<td>42</td>
<td>06</td>
<td>25</td>
</tr>
</tbody>
</table>

**Note:** NE is Negative Engagement; PE is Positive Engagement; A is Anxiety; D is the number of daily desirable events; U is the number of daily undesirable events, and R represents the multiple correlation between both desirable and undesirable events and mood. The number following the subject ID is the length of the recording period for the subject.
### Table 5

Frequencies of Significant Correlations Between Events and Mood Factors for Males and Females

| Desirable Events  | Males | | | | | | Females | |
|-------------------|-------|---|---|---|---|---|---|---|---|
|                   | NE    | PE | A  | NE  | PE | A  | NE  | PE | A  |
| Positive rxy      | 1     | 6*| 0  | 0   | 10*| 0  | 0   | 0  | 0  |
| Negative rxy      | 2*    | 0 | 2  | 0*  | 0  | 3  | 0   | 0  | 0  |

| Undesirable Events | Males | | | | | | Females | |
|--------------------|-------|---|---|---|---|---|---|---|---|
| Positive rxy       | 5*    | 0 | 2  | 4*  | 0  | 2  | 0   | 0  | 0  |
| Negative rxy       | 0     | 5*| 2  | 0   | 3* | 0  | 0   | 0  | 0  |

**Note**: The maximum N possible for each cell was 26. NE is Negative Engagement, PE is Positive Engagement and A is Apathy. Cells with *s indicate the expected relationships; there were no expected relationships for Apathy.
Part I - Mandatory

Manager, Program in Manpower R&D (10 copies)
Code 4950
Office of Naval Research
Arlington, Virginia 22217

Head, Manpower, Personnel, Training
and Reserves Team (Op/9242)
Office of the Chief of Naval Operations
44576, The Pentagon
Washington, D. C. 20350

Assistant for Personnel Logistics Planning
Office of the CNO (Op-98710)
50772, The Pentagon
Washington, D. C. 20350

Scientific Advisor to the Deputy Chief of Naval Operations (Manpower, Personnel & Training)
Office of the DCMO(MPT) (Op-017)
2705 Arlington Annex
Washington, D. C. 20350

Head, Research, Development & Studies Branch
Office of the DCMO(MPT) (Op-152)
1512 Arlington Annex
Washington, D. C. 20350

Program Administrator for Manpower, Personnel, & Training
US Naval Material Command (Code 05122)
878 Crystal Plaza #B
Washington, D. C. 20360

Director, Decision Support Systems Branch
US Naval Military Personnel Command (1-164)
1693 Arlington Annex
Washington, D. C. 20370

Head, Evaluation Section
US Naval Military Personnel Command (1-66)
Department of the Navy
Washington, D. C. 20370

Director, Research & Analysis Division
Plans & Policy Department
Navy Recruiting Command (Code 22)
4015 Wilson Boulevard
Arlington, Virginia 22203

Military Assistant for Training & Personnel Technology
Office of the Under Secretary of Defense for Research & Engineering
3D129, The Pentagon
Washington, D. C. 20301

Personnel Analysis Division
AF/MPXG
8C350, The Pentagon
Washington, D. C. 20330

Technical Director
U.S. Army Institute for the Behavioral & Social Sciences
5001 Eisenhower Avenue
Alexandria, Virginia 22333

Program Director
Manpower Research & Advisory Services
Smithsonian Institution
801 North Pitt Street
Alexandria, Virginia 22314
**LIST 1**

**MANDATORY**

<table>
<thead>
<tr>
<th>Location</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Defense Documentation Center</td>
<td>(12 copies) 1411 Jefferson Davis Highway Arlington, Virginia 22074</td>
</tr>
<tr>
<td>Accessions Division</td>
<td>Cameron Station Alexandria, Virginia 22314</td>
</tr>
<tr>
<td>Library of Congress</td>
<td>Science &amp; Technology Division Washington, D. C. 20540</td>
</tr>
<tr>
<td>Chief of Naval Research</td>
<td>(3 copies) Code 422 600 North Quincy Street Arlington, Virginia 22217</td>
</tr>
<tr>
<td>Commanding Officer</td>
<td>Naval Research Laboratory Code 2627 Washington, D. C. 20375</td>
</tr>
</tbody>
</table>

**LIST 2**

**ONR FIELD**

<table>
<thead>
<tr>
<th>Location</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commanding Officer</td>
<td>ONR Branch Office Building 114, Section D 666 Summer Street Boston, Massachusetts 02210</td>
</tr>
<tr>
<td>Psychologist</td>
<td>1030 East Green Street Pasadena, California 91106</td>
</tr>
<tr>
<td>Commanding Officer</td>
<td>ONR Branch Office Building 114, Section D 666 Summer Street Boston, Massachusetts 02210</td>
</tr>
<tr>
<td>Psychologist</td>
<td>1030 East Green Street Pasadena, California 91106</td>
</tr>
<tr>
<td>Commanding Officer</td>
<td>ONR Branch Office Building 114, Section D 666 Summer Street Boston, Massachusetts 02210</td>
</tr>
<tr>
<td>Psychologist</td>
<td>1030 East Green Street Pasadena, California 91106</td>
</tr>
<tr>
<td>Office of Naval Research</td>
<td>Director, Technology Programs Code 200 630 North Quincy Street Arlington, Virginia 22217</td>
</tr>
</tbody>
</table>

**LIST 4**

**NAVMAT & NFRDC**

<table>
<thead>
<tr>
<th>Location</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAVMAT</td>
<td>Naval Material Command Program Administrator, Manpower, Personnel &amp; Training (Code 0CT24) 1022 Crystal Plaza #5 Arlington, D. C. 20360</td>
</tr>
<tr>
<td>NFRDC</td>
<td>Naval Material Command Management Training Center (Code 0CT25) 1022 Crystal Plaza #5 Arlington, D. C. 20360</td>
</tr>
<tr>
<td>Commanding Officer</td>
<td>Naval Personnel R&amp;D Center San Diego, California 92152</td>
</tr>
</tbody>
</table>
LIST 5

BUMED

Commanding Officer
Naval Health Research Center
San Diego, California

Commanding Officer
Naval Submarine Medical Research Laboratory
Naval Submarine Base
New London, Box 900
Groton, Connecticut 06340

Director, Medical Service Corps
Bureau of Medicine & Surgery (Code 23)
Department of the Navy
Washington, D.C. 20372

Naval Aerospace Medical Research Lab
Naval Air Station
Pensacola, Florida 32508

LIST 5

NAVAL POSTGRADUATE SCHOOL

Naval Postgraduate School
ATTN: Dr. Richard S. Elster
Department of Administrative Sciences
Monterey, California 93940

Naval Postgraduate School
ATTN: Professor John Senger
Operations Research & Administrative Science
Monterey, California 93940

LIST 7

HRM

Officer in Charge
Human Resource Management Detachment
Naval Air Station
Alameda, California 94521

OFFICER IN CHARGE
Human Resource Management Detachment
Naval Submarine Base New London
P.O. Box 81
Groton, Connecticut 06340

Officer in Charge
Human Resource Management Division
Naval Air Station
Mayport, Florida 32250

Commanding Officer
Human Resource Management Center
Pearl Harbor, Hawaii 96859
LIST 7 continued

Commander in Chief
Human Resource Management Division
U.S. Pacific Fleet
Pearl Harbor, Hawaii 96860

Officer in Charge
Human Resource Management Detachment
Naval Base
Charleston, South Carolina 29400

Commanding Officer
Human Resource Management School
Naval Air Station Memphis
Millington, Tennessee 38054

Human Resource Management School
Naval Air Station Memphis (56)
Millington, Tennessee 38054

Commanding Officer
Human Resource Management Center
1300 Wilson Boulevard
Arlington, Virginia 22209

Commanding Officer
Human Resource Management Center
5621-23 Tidewater Drive
Norfolk, Virginia 23511

Commander in Chief
Human Resource Management Division
U.S. Atlantic Fleet
Norfolk, Virginia 23511

Officer in Charge
Human Resource Management Detachment
Naval Air Station Whidbey Island
Oak Harbor, Washington 98278

Commanding Officer
Human Resource Management Center
Box 23
FPO New York 09510

Commander in Chief
Human Resource Management Division
U.S. Naval Force Europe
FPO New York 09510

Officer in Charge
Human Resource Management Detachment
Box 60
FPO San Francisco 96651

Officer in Charge
Human Resource Management Detachment
COMNAVFORJAPAN
FPO Seattle 98762

LIST 8
NAVY MISCELLANEOUS

Naval Amphibious School
Director, Human Resource Training
Department
Naval Amphibious Base
Little Creek
Norfolk, Virginia 23521

Chief of Naval Education & Training (N-5)
ACOS Research & Program Development
Naval Air Station
Pensacola, Florida 32508

Naval Military Personnel Command (2 copies)
FM Department (NMPC-6)
Washington, D.C. 20350

Naval Recruiting Command
Head, Research & Analysis Branch
Code 4M, Rec-805302
261 North Randolph Street
Arlington, Virginia 22203

Chief of Naval Technical Training
ATTN: Dr. Norman Kerr, Code 0181
NAS Memphis (73)
Millington, Tennessee 38054

Naval Training Analysis & Evaluation
Group
Orlando, Florida 32813

Commanding Officer
Naval Training Equipment Center
Orlando, Florida 32813

Naval War College
Management Department
Newport, Rhode Island 02884

LIST 6
LSMC

Commandant of the Marine Corps
Headquarters, U.S. Marine Corps
Code 4P1-20
Washington, D. C. 20360

LIST 11
OTHER FEDERAL GOVERNMENT

National Institute of Education
Educational Equity Grants Program
1200 19th Street, NW
Washington, D. C. 20208

National Institute of Education
ATTN: Dr. Fritz Muhlküser
EDLC/SMO
1200 19th Street, NW
Washington, D. C. 20208

National Institute of Mental Health
Minority Group Mental Health Programs
Room 7 - 102
5600 Fishers Lane
Rockville, Maryland 20852

LIST 12
ARMY

Army Research Institute
Field Unit - Monterey
P.O. Box 5787
Monterey, California 93940

Deputy Chief of Staff for Personnel,
Research Office
ATTN: DIPE-FER
Washington, D. C. 20310

Headquarters, FORSCOM
ATTN: AFFA-HR
Ft. McPherson, Georgia 30330

Army Research Institute
Field Unit - Leavenworth
P.O. Box 3122
Fort Leavenworth, Kansas 66027

Technical Director (2 copies)
Army Research Institute
5001 Eisenhower Avenue
Alexandria, Virginia 22333
LIST 13
AIR FORCE

Air University Library/LSER 78-443
Maxwell AFB, Alabama 36112

AFOSR/ML (Dr. Fregly)
Building 410
Bolling AFB
Washington, D.C. 20332

Air Force Institute of Technology
AFIT/LSER (Lt. Col. Umstot)
Wright-Patterson AFB
Dayton, Ohio 45433

LIST 14
MISCELLANEOUS

Dr. Edwin A. Fleishman
Advanced Research Resources Organization
Suite 900
433 East West Highway
Washington, D.C. 20014

Australian Embassy
Office of the Air Attaché (S3E)
1601 Massachusetts Avenue, NW
Washington, D.C. 20036

British Embassy
Scientific Information Officer
Room 509
3100 Massachusetts Avenue, NW
Washington, D.C. 20008

Canadian Defense Liaison Staff, Washington
ATTN: CORD
2450 Massachusetts Avenue, NW
Washington, D.C. 20008

LIST 15
CURRENT CONTRACTORS

Dr. Clayton E. Alderfer
School of Organization & Management
Kean University
New Jersey, New Jersey 07030

Dr. H. Russell Bernand
Department of Sociology & Anthropology
West Virginia University
Charleston, West Virginia 25366
LIST 15 continued

Dr. Thomas M. Ostrom
Department of Psychology
70 East Stadium
Clemson State University
Clemson, South Carolina 29631

Dr. George E. Rowland
Temple University, Merid Center
Potter Annex, 2nd Floor
College of Education
Philadelphia, Pennsylvania 19122

Dr. Benjamin Schreiber
Michigan State University
East Lansing, Michigan 48824

Dr. Saul E. Sells
Institute of Behavioral Research
Texas Christian University
Druker C
Fort Worth, Texas 76129

Dr. H. Wallace Sineiko
Program Director, Merchman Research
Advisory Services
Smithsonian Institution
821 North Pitt Street, Suite 120
Alexandria, Virginia 22314

Dr. Richard Steers
Graduate School of Management & Business
University of Oregon
Eugene, Oregon 97403