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ABSTRACT

The calculation of second-order results in the validity assessment of measures and some useful interpretation aids are presented. First-order and second-order results give different and informative pictures of data dynamics. Several aspects of good practice in interpretation of second-order results are presented using data from 487 subjects responding to the Love Relationships Scale (LRS) of B. Thompson and G. M. Borrello (1987, 1989). Fifty-one of the subjects participated in this study, and the rest of the subjects participated in previous studies of the LRS. It is suggested that interpreting only the rotated second-order factor matrix is not good practice. It is also suggested that interpretation can be aided by consulting both the unrotated and the rotated S(VxS) product matrix obtained by post-multiplying the first-order factor pattern matrix by the second-order factor pattern matrix. It is further suggested that orthogonalizing the first-order factors using the algorithm of J. Schmid and J. Leiman (1957) is helpful in interpreting second-order results. Seven tables present product matrices and listings of items from product matrices, one figure illustrates culturally-defined stereotypic love, and the LRS is appended. (Author/SLD)

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SECOND-ORDER FACTOR ANALYSIS AS A VALIDITY ASSESSMENT TOOL: A CASE STUDY EXAMPLE INVOLVING PERCEPTIONS OF STEREOTYPIC LOVE

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ABSTRACT

Second-order factor analysis can be valuable in the validity assessment of measures, because first-order and second-order results paint different and informative portraits of data dynamics. Several aspects of good practice in interpretation of second-order results are presented and illustrated using data from 487 subjects responding to the Love Relationships Scale. First, it is suggested that interpreting only the rotated second-order factor matrix is not good practice. Second, it is suggested that interpretation can be aided by consulting both the unrotated and the rotated S(VxS) product matrix obtained by postmultiplying the first-order factor pattern matrix by the second-order factor pattern matrix. Finally, it is suggested that orthogonalizing the first-order factors using the Schmid and Leiman (1957) algorithm is helpful in interpreting second-order results.

Factor analysis has been closely associated with evaluating the construct validity of measures. Nunnally (1978, p. 111) notes that "construct validity has been spoken of as 'trait validity' and 'factorial validity.'" Gorsuch (1983, pp. 350-351) suggests that

> A prime use of factor analysis has been in the development of both the theoretical constructs for an area and the operational representatives for the theoretical constructs... If a theory has clearly defined constructs, then scales can be directly built to embody those constructs.

Thus, "factor analysis is intimately involved with questions of validity... Factor analysis is at the heart of the measurement of psychological constructs" (Nunnally, 1978, p. 112).

Many researchers are familiar with the extraction of principal components from either a variance-covariance matrix or a correlation matrix. However, the factors extracted from such matrices, called first-order factors, can be rotated obliquely such that the rotated factors themselves are correlated. This interfactor matrix can then, in turn, also be subject to factor analysis. These "higher order" factors would be termed second-order factors.

As Kerlinger (1984, p. xivv) noted, "while ordinary factor analysis is probably well understood, second-order factor analysis, a vitally important part of the analysis, seems not to be widely known and understood." Example applications of second-order factor analysis are reported by Kerlinger (1984), Thompson and Borrello (1986), and by Thompson and Miller (1981).

This paper explains and illustrates the calculation of second-order results and some useful interpretation aids. An actual data set involving responses of 487 subjects to the Love Relationships Scale (LRS) is employed to make the discussion concrete. The 487 subjects consisted of 51 subjects who participated in the present study, and two pools of subjects who participated in previous LRS studies. Table 1 presents the demographic characteristics of the samples. Thompson and Borrello (1987) and Borrello and Thompson (1989) describe the instrument's development and report validity data such as LRS correlations with Hendrick and Hendrick's (1987, in press) measure of Lee's typology of love.

INSERT TABLE 1 ABOUT HERE.

Example Second-Order Analyses

The analyses described here were conducted using a FORTRAN program, SECONDOR, written by and available from the junior author.[1] However, several features of the model analyses can also be conducted using "canned" computer packages such as SPSS-X and SAS. All factor extraction in the present study employed principal components as the extraction method.

The first decision that the researcher must make when conducting a factor analysis is how many first-order factors to extract. There are numerous criteria that can be employed when making this decision (Zwick & Velicer, 1986). However, many researchers conducting principal components find it useful to extract all components with eigenvalues greater than 1.0

(Guttman, 1954). In the present example, 14 first-order principal components were extracted from the correlation matrix based on the eigenvalue-greater-than-one criterion.

The 14 first-order components were then rotated obliquely, meaning that the components were rotated so that the factors were allowed to be correlated with each other. There are many oblique rotation procedures. But one of the more popular procedures is the PROMAX method developed by Henrickson and White (1964).

The first step of PROMAX rotation involves the rotation of the first-order factors to orthogonal (i.e., uncorrelated) structure. This is usually done using the VARIMAX rotation method developed by Kaiser in his doctoral dissertation, and subsequently published as Kaiser (1958). Then the entries in this rotated matrix are raised to some power, usually 3.0, and the signs of the original VARIMAX matrix are restored in the new matrix which becomes what is called a "target" matrix. Next the VARIMAX matrix is rotated to a position of best fit with the target matrix using what is called a Procrustes rotation, so named after the mythical innkeeper who cutoff or stretched his guests to best fit his inn's bed. This result matrix is the PROMAX rotated matrix with correlated first-order factors.

The next step of the analysis involves the extraction of second-order factors from the matrix of correlations among the first-order PROMAX-rotated components. Again, several criteria can be employed to decide the number of second-order factors to extract. However, the eigenvalue-greater-than-one rule can be

useful in guiding this decision (Gorsuch, 1983, p. 244). In the present example the prerotation eigenvalues (Thompson, in press) for the first six second-order principal components were 2.8, 1.6, 1.4, 1.2, 1.0, and 0.9. Therefore, five second-order components were extracted and rotated to the VARIMAX criterion.

At this point the analysis is complete, and it is time to interpret the results. However, how best to conduct this interpretation is open to discussion. Even some very sophisticated researchers attempt to interpret the second-order factors using only the first-order factors. For example, in his review of Kerlinger's (1984) second-order analyses, Thompson (1985, p. 430, emphasis added) notes that

> It is particularly disturbing that the second-order factors are interpreted [by Kerlinger] in terms of the first-order factors. A number of strategies for relating the second-order structure back to the original items have been proposed and would have been appropriate.

As Gorsuch (1983, p. 245) argues,

> Interpretations of the second-order factors would need to be based upon the interpretations of the first-order factors that are, in turn, based upon the interpretations of the variables... To avoid basing interpretations upon interpretations, the relationships of the original variables to each level of the higher-order factors are determined.

Gorsuch (1983, p. 247) suggests that one way to avoid "interpretations of interpretations" is to postmultiply the

first-order factor pattern matrix by the orthogonally rotated second-order factor pattern matrix. The matrix algebra formula to derive this result matrix is:

$$S_{(V \times S)} = P_{(V \times F)} \times V'_{(F \times S)},$$

where, in the present example,

P is the PROMAX-rotated 55x14 first-order pattern coefficient matrix;

V is the VARIMAX-rotated 14x5 second-order factor pattern/structure coefficient matrix; and

S is the unrotated 55x5 product matrix derived by multiplying these two matrices together.

However, if rotation is used to facilitate interpretation of other structures, it also seems plausible to rotate the product matrix itself to the varimax criterion. Both forms of the product matrices are calculated by SECONDOR. Table 2 presents the 14x5 VARIMAX-rotated second order factor matrix. Table 3 presents the product matrix rotated to the varimax criterion for the present example.

INSERT TABLES 2 AND 3 ABOUT HERE.

Another useful interpretation aid involves the manipulations proposed by Schmid and Leiman (1957), also explained by Gorsuch (1983, pp. 248-254). This solution "orthogonalizes" the two levels of analyses to each other and also allows interpretation of both levels of analysis in terms of the observed variables. Table 4 presents the example Schmid-Leiman solution for these data. It should be noted that the first five columns in Table 4

are also equivalent to the unrotated product matrix that Gorsuch (1983, p. 247) suggests can be interpreted without rotation.

INSERT TABLE 4 ABOUT HERE.

Example Interpretation of Second-Order Results

Gorsuch (1983, p. 240) suggests that the various levels of analysis give different perspectives on data. The first-order analysis is a close-up view that focuses on the details of the valleys and the peaks in mountains. The second-order analysis is like looking at the mountains at a greater distance, and yields a potentially different perspective on the mountains as constituents of a range. Both perspectives may be useful in facilitating understanding of data. It is also useful to know what one looses or gains by employing one perspective or the other for a given data set.

Global View Focusing on the Second-Order Factors

The VARIMAX rotated product matrix presented in Table 3 is a view of the five second-order factors portrayed using the 55 LRS items. This view is analogous to looking at the mountains from a distance to focus on the identity of the mountains and the range they constitute while ignoring the nuances of smaller hills and valleys. Table 5 presents those items that were correlated more than absolute 0.3 with these rotated second-order results.

INSERT TABLE 5 ABOUT HERE.

The first factor presented in Table 5 had a postrotation eigenvalue of 1.91, the fourth largest of the five postrotation

eigenvalues for this solution. The seven items meeting that salience criterion (i.e., r > |.3|) involved "love at first sight" and dynamics involving love based on impressions. The factor might be labelled Impressionistic Love. The factor is similar to the Factor VII isolated from the same data set in a variation on first-order factor analysis called "bootstrap" factor analysis (Borrello & Thompson, 1989). However, this factor has not been isolated in any other factor analytic work with the Love Relationship Scale (Borrello & Thompson, 1987; Thompson & Borrello, 1987).

The second factor presented in Table 5 had a postrotation eigenvalue of 5.05, the second largest of the five postrotation eigenvalues for this solution and appreciably larger than eigenvalues for all the factors except Factor III. The factor is very similar to the Committed Affect factor identified by Borrello and Thompson (1989). In previous work (e.g., Thompson & Borrello, 1987) these items delineated two different factors labelled as Love Affects and Committed Love.

Perusal of Table 5 indicates that the items salient to Factor II almost all had negative structure coefficients. This has no particular significance. As Gorsuch (1983, p. 181) notes,

> ...the direction of a factor is always arbitrary. Any factor with a preponderance of negative salient loadings can always be reversed. One simply multiplies the factor (i.e., its loadings and correlations with other factors) by -1...

The third factor presented in Table 5 had a postrotation eigenvalue of 7.90, appreciably the largest of the five

postrotation eigenvalues for this solution. This factor is very similar to the Consumate Obsession factor isolated by Borrello and Thompson (1989). This factor has consistently been identified as a dominant construct in previous research with the LRS (Thompson & Borrello, 1987).

The fourth factor presented in Table 5 had a postrotation eigenvalue of 1.50, the smallest of the five postrotation eigenvalues for this solution. This factor corresponds to the Willed Love factor identified by Borrello and Thompson (1989) and also in previous research.

The fifth factor presented in Table 5 had a postrotation eigenvalue of 2.67, the third largest of the five postrotation eigenvalues for this solution. This factor is similar to a construct that in other studies has been labelled Willed Love (Thompson & Borrello, 1987).

Close-Up View Focusing on Both Second-Order Factors and Orthogonalized First-Order Factors

Table 6 presents a listing of the items that met the salience criterion (i.e., $r > |.3|$) with respect to the Schmid and Leiman (1957) results present in Table 4. As noted previously, these results are useful both for a global view of the second-order factors and for a closer view of the nuances of the hills and valleys in the solution, i.e., the first-order factors orthogonalized for variance in the second-order factors.

INSERT TABLE 6 ABOUT HERE.

The previous interpretation of the second-order factors

involved the VARIMAX-rotated product matrix, S(VxS). The results reported for the second-order factors in the Schmid-Leiman (1957) solution invoke an interpretation of the unrotated product matrix, S(VxS). In the present example the five second-order factors as they are portrayed in Table 6 retain essentially the same meaning they had when they were orthogonally rotated. And the unrotated five product factors presented in Table 6 have essentially the same trace as they had in the rotated matric presented in Table 3, i.e., 1.81 vs 1.91; 4.88 vs 5.05; 7.48 vs 7.90; 1.50 vs 1.77; and 2.67 vs 1.70.

Table 7 presents the names given to each first-order factor based on consulting the results for the Schmid-Leiman solution reported in Tables 4 and 6. Figure 1 presents a map of the love construct derived by consulting Tables 2, 4 and 6.

INSERT TABLE 7 AND FIGURE 1 ABOUT HERE.

Discussion

It was suggested at the outset that factor analysis is central to the construct validity evaluations of measures, and that second-order factor analysis can often be very useful for these purposes (Gorsuch, 1983, pp. 350-351; Nunnally, 1978, p. 112). Data from previous studies (Borrello & Thompson, 1987, 1989; Thompson & Borrello, 1987) of a measure of perceptions of love were employed to provide a concrete basis for enumerating the unique insights that can be derived from second-order factor analysis.

Gorsuch (1983) suggests that different levels of analysis

offer different perspectives on the constructs under study. The second-order perspective is more global while the first-order perspective is narrower and yields finer detail. Thus, the analysis allows contrasts of the perspectives to identify similarities and differences.

In the present example the results indicate that both the first-order and the second-order factor space is dominated by a general or "G" factor involving Obsession. As reported in Tables 3 and 5 for results involving the VARIMAX rotated product matrix, Factor III had a postrotation eigenvalue of 7.90 and 32 items had structure coefficients meeting the salience criterion employed here (i.e., $r > |.31|$). As reported in Tables 4 and 6, the third second-order factor in the Schmid and Leiman (1957) solution, labelled Consumate Obsession, had an eigenvalue of 7.48. This eigenvalue accounted for 24% of the trace (31.13) in this solution involving a total of 19 (5 + 14) factors. As reported in Tables 2 and 7 and Figure 1, four first-order factors were salient to this second-order factor.

It is also noteworthy that the first-order Factor 1, Obsession, described in Tables 4 and 6, had an eigenvalue of 1.97 even after orthogonalization using the second-order factors. The eigenvalues for all the other first-order factors described in Tables 4 and 6 ranged from 0.46 to 1.09. These results suggest that culturally-defined stereotypic love consists in large part of elements of obsession, whether a first-order or a second-order perspective is invoked.

Committed Affect, with an eigenvalue of 4.88, also plays a large role in defining the construct's factor space. As reported

in Tables 3 and 5, 20 items were deemed salient to the rotated product matrix solution. As reported in Tables 2 and 7 and Figure 1, four orthogonalized first-order factors were highly associated with this second-order factor.

Consumate Obsession and Committed Affect are uncorrelated constructs. It is intriguing that Consumate Obsession involves Exciting Uncertainty, Love Fears and Love Irrationality, while Love Exhilaration was correlated (though negatively) with Committed Affect. It is also intriguing that at both the first-order and the second-order levels Sexual Love delineates a unique entity not involving other dynamics.

Two factors, Love Illusion and Love Irrationality, exist in first order structure but tend to get lost in second-order structure. As reported in Tables 2 and 7, these factors had small communality coefficients in the rotated second-order structure matrix, respectively 39% and 41%. The correlation coefficients of these first-order factors with the second-order factors with which these first-order factors were most salient also tended to be very small.

These two factors are examples of "nuance valleys or hills" that get lost in the broader second-order perspective looking at mountains and the range the mountains constitute. Only a second-order analysis will inform the researcher regarding which factors remain salient across perspectives. Such differences may be useful in evaluating the importance of factors. Furthermore, factors that exist exclusively at one level may be less likely to recur in future studies.

In summary, several aspects of good practice in interpretation of second-order results have been presented and illustrated. First, it has been suggested that interpreting only the rotated second-order factor matrix, e.g., matrices of the form of Table 2, is not good practice. This is a matrix of factors of factors of variables. As several theorists (Gorsuch, 1983, p. 245; Thompson, 1985, p. 430) have noted it is tenuous to base interpretations only upon abstractions of abstractions of observed variables. The interpretation gets too removed from the familiar and understood actually observed variables.

Second, it has been suggested that interpretation can be aided by consulting both the unrotated (Gorsuch, 1983, p. 247) and the rotated S(VxS) product matrix. Table 3 presents an example of a VARIMAX rotated product matrix. The first five columns of a Schmid and Leiman (1957) solution were the unrotated product matrix.

Finally, it has been suggested that orthogonalizing the first-order factors using the Schmid and Leiman (1957) algorithm is helpful in interpreting second-order results. Table 4 presented an illustrative solution.

Second-order factor analysis can be valuable in validity assessment, because first-order and second-order results paint different portraits of data dynamics. Some researchers obliquely rotate first-order correlated factors and then only report and interpret these results. But as Gorsuch (1983, p. 255) notes, "Rotating obliquely in factor analysis implies that the factors do overlap and that there are, therefore, broader areas of generality than just a primary factor. Implicit in all oblique

rotations are higher-order factors." However, the potentials of second-order analysis will only be realized when correct practice is followed.

Footnote

[1] A listing of Program SECONDOR can be obtained by writing: Bruce Thompson, Research Professor of Education, College of Education, University of New Orleans, New Orleans, LA 70148. The program can also be sent on BITNET by persons contacting the junior author at BITNET address "BBTEL@UNO".

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Table 1
Sample Demographic Characteristics

Study	Age	Female	n
Borrello & Thompson (1987)	32.9 (5.5)	135(76.7%)	176
Thompson & Borrello (1987)	35.4 (7.1)	207(79.6%)	260
New subjects added	36.1(11.0)	34(66.7%)	51
Total	35.0 (7.5)	376(77.2%)	487

Table 2
VARIMAX Rotated Second-Order V(FxS) Matrix

1st Ord Factor	Second-Order I	II	III	IV	V	h^2
1	-.138	-.180	-.722	.010	-.272	.647
2	-.292	-.713	.045	.085	.132	.620
3	.059	.025	-.749	-.212	.056	.614
4	-.370	.061	-.290	.560	.171	.568
5	-.585	-.151	-.256	-.135	-.234	.504
6	.031	-.085	.013	.038	.833	.704
7	.637	-.015	-.306	-.016	-.072	.506
8	.228	-.199	-.449	.331	-.102	.413
9	-.255	.433	.304	-.170	-.124	.390
10	-.123	.015	-.605	.214	-.392	.581
11	.052	.730	.001	.177	-.084	.574
12	-.166	.059	.652	-.111	-.287	.550
13	-.174	-.056	-.113	-.816	.029	.713
14	.170	-.636	-.182	-.027	-.337	.580
Trace	1.22	1.75	2.46	1.28	1.26	7.96

Table 3
VARIMAX Rotated S(VxS) [= P(VxF) x V(FxS)] Product Matrix

Item	I	II	III	IV	V	h^2
1	.040	.084	-.319	.059	-.312	.211
2	-.109	-.400	-.145	.159	.015	.219
3	-.159	-.417	-.079	.163	.007	.232
4	.030	.014	-.460	.330	-.158	.346
5	.281	-.438	-.346	.100	-.004	.400
6	.042	-.628	-.005	-.027	.069	.402
7	.199	-.448	.113	.321	.116	.369
8	-.072	.085	.009	.462	-.046	.228
9	-.078	-.193	-.323	.173	-.165	.205
10	.103	.323	-.276	-.110	-.355	.329
11	.298	-.042	-.203	.022	.079	.139

12	-.177	-.168	-.012	.416	.058	.236
13	.113	-.141	-.272	.624	.091	.504
14	-.036	-.596	.043	.167	-.033	.387
15	-.036	-.628	.037	.075	-.117	.417
16	.476	.009	-.252	-.059	-.122	.308
17	.201	.000	-.551	.215	-.191	.426
18	.229	-.222	-.348	.024	-.192	.260
19	-.029	-.187	-.453	.152	-.350	.386
20	.062	-.086	-.492	.058	-.187	.291
21	-.025	.270	-.442	-.023	-.320	.372
22	.185	-.343	-.324	-.091	-.197	.304
23	.176	-.603	-.264	-.126	-.149	.503
24	.344	.275	.100	.019	.022	.205
25	.401	-.324	.091	-.171	.119	.317
26	.282	-.421	-.304	.073	-.242	.413
27	.385	.045	-.400	.311	-.036	.409
28	.090	-.417	-.323	.091	-.105	.305
29	-.142	-.340	-.422	-.094	-.049	.326
30	.063	-.240	-.540	-.036	-.035	.356
31	-.027	-.560	-.054	-.068	.164	.349
32	.075	.114	-.470	.056	-.065	.246
33	.063	-.092	-.152	-.014	.511	.297
34	.243	-.227	-.484	-.099	.030	.355
35	.034	-.179	-.489	-.155	.005	.296
36	.148	-.129	-.305	-.095	-.414	.312
37	.123	-.233	-.241	.108	.180	.171
38	.156	-.526	.000	.045	.140	.323
39	-.064	-.395	-.133	-.084	.043	.187
40	-.070	-.083	-.578	-.116	.165	.387
41	-.340	-.326	-.254	.069	.127	.308
42	.104	-.208	-.548	.027	-.101	.366
43	.077	-.146	-.627	.049	-.121	.437
44	.447	.058	-.233	-.265	-.021	.328
45	-.042	-.509	-.085	-.117	.056	.285
46	-.061	-.035	-.554	.262	-.033	.382
47	.310	-.051	-.362	.269	.339	.417
48	.067	-.040	-.586	.031	.124	.365
49	-.034	-.392	-.393	.031	-.087	.318
50	.088	-.134	-.612	-.090	.197	.447
51	.070	-.046	-.597	-.008	.303	.455
52	-.108	-.270	-.490	.192	-.075	.367
53	.097	.003	-.676	.117	-.073	.485
54	.057	-.021	-.562	-.020	-.035	.322
55	.226	-.072	-.506	.099	.042	.324
Sum	1.91	5.05	7.90	1.77	1.70	18.34

Table 4
Orthogonalized Schmid & Leiman (1957) Solution

Item	I	II	III	IV	V	1	2	3	4	5
1	-.084	.048	-.226	.032	-.387	-.018	.052	.001	.108	.090
2	-.220	-.366	-.170	.043	.072	.073	.393	.047	-.028	.050
3	-.258	-.379	-.099	.050	.094	.043	.494	-.004	-.043	.032
4	-.212	.027	-.473	.164	-.223	.182	.095	.148	.084	-.048
5	.108	-.442	-.426	.095	-.058	.301	.149	.010	-.068	-.076
6	.001	-.616	-.052	-.005	.142	-.062	.343	.030	-.065	.049
7	.024	-.406	-.100	.365	.247	-.130	.205	-.022	.254	-.124
8	-.265	.134	-.100	.357	.050	-.006	-.054	.032	.485	.008
9	-.237	-.185	-.284	.046	-.178	.011	.001	.022	.084	.455
10	.067	.254	-.131	-.061	-.489	.045	-.026	.019	.029	-.086
11	.229	-.052	-.284	.055	-.014	-.051	.042	.089	-.021	-.086
12	-.344	-.100	-.115	.251	.178	-.047	.073	.000	.465	.023
13	-.214	-.068	-.490	.442	.133	.095	.017	-.072	.224	.144
14	-.160	-.569	-.023	.160	.108	.048	.361	-.019	.085	-.012
15	-.138	-.621	.021	.105	.015	-.055	.362	.006	.122	-.058
16	.380	-.049	-.294	.094	-.257	-.062	.077	.020	-.030	.082
17	-.033	-.015	-.554	.120	-.322	.223	-.005	.008	.038	.003
18	.083	-.257	-.334	.051	-.270	.066	-.049	-.113	-.099	.114
19	-.235	-.208	-.358	.051	-.397	.331	.016	-.015	-.046	.125
20	-.082	-.107	-.422	-.044	-.304	.373	-.072	-.064	.044	.035
21	-.105	.225	-.281	-.106	-.469	.090	-.043	.050	-.053	.023
22	.088	-.386	-.270	-.048	-.269	.115	-.004	-.030	-.004	.005
23	.088	-.639	-.227	-.063	-.175	.062	.043	-.015	.000	.058
24	.332	.250	.000	.178	-.025	.026	-.085	-.055	.109	-.416
25	.425	-.352	-.015	.038	.103	.039	.069	-.004	-.043	-.402
26	.086	-.457	-.320	.146	-.270	.203	.042	.006	-.061	.014
27	.135	.045	-.535	.284	-.144	.183	-.155	.008	.033	-.098
28	-.065	-.420	-.327	.041	-.126	.119	.001	-.002	.027	.036
29	-.181	-.341	-.309	-.254	-.127	.232	.100	-.065	.050	-.110
30	-.035	-.250	-.482	-.169	-.177	.489	-.011	-.020	-.004	-.062
31	-.024	-.537	-.087	-.108	.204	-.063	.181	.021	-.079	.001
32	-.028	.104	-.428	-.068	-.217	.035	.014	.500	.029	-.066
33	.119	-.034	-.279	-.159	.422	.076	-.078	.245	.042	-.011
34	.169	-.250	-.475	-.143	-.136	.162	-.065	.075	-.076	.010
35	.013	-.196	-.400	-.271	-.155	.035	-.047	-.033	.042	.010
36	.043	-.200	-.178	-.012	-.488	.050	.074	.075	-.056	-.008
37	.034	-.205	-.333	.021	.131	-.018	.148	-.112	-.054	-.031
38	.090	-.507	-.113	.081	.196	-.055	-.047	-.004	.084	-.064
39	-.067	-.388	-.103	-.138	.046	-.121	.003	-.022	-.044	.023
40	-.071	-.070	-.500	-.355	-.030	.187	.033	.013	-.003	-.084
41	-.369	-.273	-.204	-.192	.138	.309	.090	-.033	.064	.153
42	-.037	-.223	-.501	-.088	-.237	.535	.017	-.062	-.044	-.021
43	-.079	-.160	-.562	-.104	-.280	.479	.043	.023	-.073	-.038
44	.471	-.009	-.230	-.105	-.204	.117	-.027	.011	.035	-.035
45	-.034	-.504	-.065	-.139	.080	.073	.000	.052	-.004	-.023
46	-.257	-.006	-.546	.010	-.135	.249	.042	.040	.035	.127
47	.151	-.003	-.569	.143	.224	.239	.031	.059	-.011	-.137
48	-.021	-.027	-.575	-.172	-.062	-.020	.001	.509	.016	.054
49	-.151	-.391	-.342	-.088	-.133	-.018	.019	.060	.070	.067
50	.050	-.126	-.589	-.286	-.017	.020	-.052	.133	-.022	.142
51	.028	-.015	-.619	-.251	.090	-.073	.034	.452	-.030	.097

52	-.286	-.247	-.455	-.027	-.128	.253	.002	.093	.053	.147
53	-.076	-.002	-.636	-.074	-.262	.402	-.080	-.005	.038	.023
54	-.030	-.033	-.495	-.172	-.212	.021	-.044	.119	-.021	-.095
55	.080	-.073	-.547	-.004	-.113	-.030	-.054	.058	-.035	-.076
	1.81	4.88	7.48	1.50	2.67	1.97	1.03	.93	.73	.84

Item	6	7	8	9	10	11	12	13	14	h^2
1	-.280	.075	-.133	-.270	.079	.136	-.029	.065	-.040	.440
2	-.076	-.088	-.094	-.213	-.070	.157	-.136	.006	-.042	.501
3	.014	.041	.019	.057	.081	.069	-.044	.020	-.121	.514
4	-.022	-.098	.020	.047	.193	.135	.074	-.021	.023	.494
5	.096	.067	-.020	-.036	.026	.021	-.025	-.066	.189	.581
6	.065	.076	.056	.006	-.043	-.049	-.070	-.013	.141	.574
7	.092	.006	.183	-.069	.020	.011	-.030	.011	.170	.586
8	-.068	.022	-.098	.030	-.058	-.039	.031	-.034	-.012	.491
9	-.083	.141	.055	-.070	-.092	-.077	-.028	-.055	-.035	.473
10	-.364	.064	.074	.119	-.030	.041	-.077	.058	-.082	.515
11	-.047	.006	.635	.077	-.094	.037	-.016	.103	-.050	.594
12	.023	-.002	-.019	-.094	.014	-.034	.089	.096	-.024	.490
13	.113	-.048	.265	.038	.065	.036	-.155	-.051	-.026	.709
14	-.035	-.006	-.055	.003	-.112	-.067	-.112	-.063	.089	.573
15	-.098	.006	.084	-.039	-.052	-.140	.010	.024	.057	.613
16	-.057	.500	.164	.129	.104	.020	.023	-.046	.019	.637
17	-.040	.013	.236	.054	.134	.106	.019	.044	.050	.572
18	-.043	-.020	.480	-.186	.076	-.030	.049	.086	-.001	.586
19	-.119	-.068	.078	.012	.029	-.116	.065	-.070	-.053	.565
20	-.055	.016	-.098	-.049	-.021	.044	-.016	.039	.123	.477
21	-.124	.013	-.082	.408	.193	.079	-.106	-.001	.142	.651
22	.068	.044	-.050	.092	.062	.076	-.010	.025	.498	.594
23	-.010	.038	-.019	-.172	-.039	-.097	-.009	.026	.362	.686
24	-.141	.055	.052	.112	.023	-.069	-.122	.001	-.083	.466
25	-.031	.089	.030	-.209	.044	-.233	.030	.011	-.037	.599
26	-.033	-.004	.054	-.040	-.012	-.066	-.012	-.127	.250	.549
27	.044	.000	.118	-.060	.233	-.041	-.022	-.080	-.002	.559
28	-.040	-.107	-.050	-.443	.080	-.074	.041	.032	.074	.553
29	-.043	-.022	-.012	.021	.105	-.169	-.011	.221	-.008	.500
30	.014	.028	-.006	-.054	-.079	-.032	.059	.101	.054	.626
31	.072	-.030	-.054	-.322	.108	-.177	-.003	.066	-.039	.554
32	-.098	-.073	.067	.021	.021	.060	.227	-.039	.009	.580
33	.105	-.062	.029	-.028	-.362	.009	-.192	.028	.062	.560
34	-.063	.015	.067	-.245	-.050	-.033	-.085	.070	.074	.487
35	-.013	.004	.124	-.324	.136	.080	.052	.320	.096	.563
36	-.338	-.003	.101	-.052	-.045	-.085	-.022	-.034	.001	.467
37	-.075	-.059	.007	.050	.013	.003	-.561	.054	.024	.540
38	-.011	-.012	-.062	-.253	.020	-.446	-.112	-.046	-.027	.622
39	-.060	-.119	-.033	.087	.058	-.329	-.315	.031	.084	.449
40	-.052	-.039	.135	.043	.019	-.009	-.187	.299	-.067	.584
41	.152	-.014	-.015	.044	-.095	-.095	.093	.112	-.062	.508
42	.013	.059	.027	.014	-.070	.005	.038	.043	.040	.673
43	-.032	.002	-.055	-.012	.023	.032	.006	.031	.014	.682
44	-.043	.578	-.109	.033	-.043	.007	.094	.023	.071	.710
45	.064	.026	.033	-.019	.025	-.455	.131	.007	-.040	.526
46	.019	.036	-.133	.033	.182	.007	-.067	.003	-.086	.530

47	.097	.085	-.033	-.061	.089	-.035	-.206	-.048	-.170	.601
48	-.028	.048	-.036	.022	.073	-.098	.091	-.025	-.031	.658
49	.036	.033	-.132	.060	.259	-.231	-.025	.044	.175	.509
50	.023	.090	.210	-.051	.022	-.013	-.111	.204	.019	.599
51	.007	.061	.002	-.003	.029	-.011	-.090	.052	-.038	.693
52	-.021	-.096	.050	-.006	-.024	-.138	.003	-.003	-.020	.496
53	-.035	.018	-.029	-.009	.017	.083	-.081	.082	.057	.682
54	.017	-.046	.002	-.021	.379	-.017	.028	.162	.064	.525
55	.036	.023	-.024	-.101	.437	-.088	-.097	.073	-.001	.564
	.55	.75	1.09	1.06	.90	.93	.82	.46	.75	31.13

Note. The row after the orthogonalized matrix presents the sum of the entries in a given column. The first five columns represent the second order factors. The next 14 columns represent the first order solution, based on variance orthogonal to the second order (Gorsuch, 1983, pp. 248-254).

The first five columns constitute the unrotated S(VxS) matrix that Gorsuch (1983, p. 247) recommends as the basis for interpretation.

Table 5
Listing of Selected Items from Rotated S(VxS) Product Matrix

	F A C T O R I (Eigenvalue = 1.91)	
16	LOVE AT FIRST SIGHT IS REAL	.48
44	I HAVE EXPERIENCED LOVE AT FIRST SIGHT	.45
25	SOME INSTANCES MORE ALL-CONSUMING THAN OTHER INSTANCES	.40
27	LOVE MAKES YOU FEEL AFRAID AND EVEN PHYSICALLY WEAK	.38
24	FEELINGS OF BEING IN LOVE CANNOT LAST FOREVER	.34
41	LOVE IS BEING ABLE SAY ANYTHING AND KNOWING IT BE LISTENED TO	-.34
47	LOVE USUALLY MAKES PEOPLE ECSTATICALLY HAPPY MISERABLY SAD	.31
	F A C T O R II (Eigenvalue = 5.05)	
15	GENUINE LOVE INVOLVES SOLID, DEEP AFFECTION	-.63
6	LOVE CREATES MEMORIES THAT CAN BE REPLAYED AND ENJOYED OVER	-.63
23	BEING IN LOVE MAKES PEOPLE FEEL TOTALLY ALIVE	-.60
14	FAITHFULNESS ESSENTIAL TO THE SUCCESS OF A LOVE RELATIONSHIP	-.60
31	EVERY LOVE IS UNIQUE	-.56
38	LOVE DOES NOT MAKE BLIND, BUT MAKE FORGIVE WHAT NORMALLY NOT	-.53
45	MORE THAN SEX, EMOTIONAL COMMITMENT IS THE OBSESSION OF LOVE	-.51
7	FEELING LOVE EASY, MAKING SUCCEED IS VERY HARD WORK	-.45
5	WHEN IN LOVE EVERYTHING REMINDS YOU OF PERSON YOU LOVE	-.44
26	NOTHING MAKES FEEL MORE ALIVE THAN BEING IN LOVE	-.42
28	LOVE MAKES SEE BEAUTY EVEN THINGS WOULDN'T ORDINARILY LIKE	-.42
3	LOVE IS FEELING THAT LOVED PERSON IS ALWAYS THERE FOR YOU	-.42
2	LOVE IS FIRM COMMITMENT TO MAKING RELATIONSHIP ENDURE	-.40
39	MOST PEOPLE ARE ONLY IN LOVE A FEW TIMES IN THEIR LIVES	-.40
49	LOVE MAKES VALUE THINGS IN SELVES THINK CAUSED THE LOVE	-.39
22	TIME MOVES FASTER WHEN YOU ARE IN LOVE	-.34
29	BEING IN LOVE MEANS DESPARATELY WANT BE LOVED IN RETURN	-.34
41	LOVE IS BEING ABLE SAY ANYTHING AND KNOWING IT BE LISTENED TO	-.33
25	SOME INSTANCES MORE ALL-CONSUMING THAN OTHER INSTANCES	-.32
10	LOVE IS BASICALLY PHYSICAL OR SEXUAL	.32
	F A C T O R III (Eigenvalue = 7.90)	
53	LOVE MAKES UNABLE TO CONCENTRATE ON ANYTHING BUT RELATIONSHIP	-.68
43	LOVE INVOLVES MAKING EVERYTHING REMIND YOU OF LOVED ONE	-.63
50	LOVE FEELING NOT IN CONTROL WHILE SOMEHOW NOT BEING AFRAID	-.61
51	UNCERTAINTY ABOUT HOW LOVED ONE FEELS MAKE LOVE EVEN STRONGER	-.60
48	SLIGHT REJECTIONS CAN GIVE RISE EVEN GREATER FEELINGS OF LOVE	-.58
40	PEOPLE TRULY LOVE SEE VISIONS MORE THAN REALITY OF ONE LOVED	-.58
54	TRUE LOVE CAN MAKE PEOPLE USED FEEL ATTRACTIVE BEGIN TO WORRY	-.56
46	LOVE DAYDREAM ONLY ABOUT EVENTS INVOLVE EXCHANGE COMMITMENT	-.55
17	LOVE INVOLVES INABILITY THINK THINGS NOT INVOLVE LOVED ONE	-.55
42	LOVE MEANS THINKING ALMOST CONSTANTLY OF LOVED ONE	-.55
30	LOVE MAKES PEOPLE THINK CONSTANTLY ABOUT PERSON WHO IS LOVED	-.54
55	FEAR OF REJECTION WHAT MAKES LOVE BOTH PAINFUL AND EXCITING	-.50
20	LOVE MAKES EVERYTHING LOVED PERSON DOES SEEM FAVORABLE GOOD	-.49
52	TRUEST FORMS OF LOVE ALL-CONSUMING AND TOTAL	-.49
35	LOVE BLINDS ONE TO TRUTH ABOUT PERSON WHO IS LOVED	-.49
34	LOVE MAKES EVERYTHING ELSE SEEM LESS SIGNIFICANT	-.48
32	FEELING LOVED ONE INATTENTIVE CAN MAKE FEEL LOVE EVEN MORE	-.47
4	LOVE IS WANT BE ABLE THINK OTHER THINGS BUT HURT TOO MUCH	-.46
19	CENTER OF WORLD ALWAYS MUST BE PERSON WHO IS LOVED	-.45
21	LOVE IS LOOKS AND PHYSICAL APPEARANCES MORE THAN TOUCHES	-.44

29	BEING IN LOVE MEANS DESPARATELY WANT BE LOVED IN RETURN	-.42
27	LOVE MAKES YOU FEEL AFRAID AND EVEN PHYSICALLY WEAK	-.40
49	LOVE MAKES VALUE THINGS IN SELVES THINK CAUSED THE LOVE	-.39
47	LOVE USUALLY MAKES PEOPLE ECSTATICALLY HAPPY MISERABLY SAD	-.36
18	LOVE IS UNCONTROLLABLE	-.35
5	WHEN IN LOVE EVERYTHING REMINDS YOU OF PERSON YOU LOVE	-.35
22	TIME MOVES FASTER WHEN YOU ARE IN LOVE	-.32
9	FEELINGS OF LOVE ARE ALWAYS TRULY PERMANENT	-.32
28	LOVE MAKES SEE BEAUTY EVEN THINGS WOULDN'T ORDINARILY LIKE	-.32
1	SEX MAKE PERSON FEEL IN LOVE WITH THE LOVER	-.32
36	POSSIBILITY OF SEX IS ESSENTIAL TO TRULY BEING IN LOVE	-.30
26	NOTHING MAKES FEEL MORE ALIVE THAN BEING IN LOVE	-.30
	F A C T O R IV (Eigenvalue = 1.77)	
13	MOST PEOPLE USUALLY FIND LOVE PEOPLE NEVER EXPECTED TO LOVE	.62
8	LOVE IS ACT OF WILL OR DECISION MORE THAN A FEELING	.46
12	TRUE LOVE REQUIRES SERIOUS EFFORT BE CONSIDERATE THOUGHTFUL	.42
4	LOVE IS WANT BE ABLE THINK OTHER THINGS BUT HURT TOO MUCH	.33
7	FEELING LOVE EASY, MAKING SUCCEED IS VERY HARD WORK	.32
27	LOVE MAKES YOU FEEL AFRAID AND EVEN PHYSICALLY WEAK	.31
	F A C T O R V (Eigenvalue = 1.70)	
33	LOVE MAKES SEE MEANINGS EVEN WHEN HAVE NO SPECIAL MEANINGS	.51
36	POSSIBILITY OF SEX IS ESSENTIAL TO TRULY BEING IN LOVE	-.41
10	LOVE IS BASICALLY PHYSICAL OR SEXUAL	-.36
19	CENTER OF WORLD ALWAYS MUST BE PERSON WHO IS LOVED	-.35
47	LOVE USUALLY MAKES PEOPLE ECSTATICALLY HAPPY MISERABLY SAD	.34
21	LOVE IS LOOKS AND PHYSICAL APPEARANCES MORE THAN TOUCHES	-.32
1	SEX MAKE PERSON FEEL IN LOVE WITH THE LOVER	-.31
51	UNCERTAINTY ABOUT HOW LOVED ONE FEELS MAKE LOVE EVEN STRONGER	.30

Note. Items were presented as complete sentences.

Table 6
Listing of Selected Items from Schmid & Leiman (1957) Solution

	F A C T O R I (Eigenvalue = 1.81)	
44	I HAVE EXPERIENCED LOVE AT FIRST SIGHT	.47
25	SOME INSTANCES MORE ALL-CONSUMING THAN OTHER INSTANCES	.42
16	LOVE AT FIRST SIGHT IS REAL	.38
41	LOVE IS BEING ABLE SAY ANYTHING AND KNOWING IT BE LISTENED TO	-.37
12	TRUE LOVE REQUIRES SERIOUS EFFORT BE CONSIDERATE THOUGHTFUL	-.34
24	FEELINGS OF BEING IN LOVE CANNOT LAST FOREVER	.33
	F A C T O R II (Eigenvalue = 4.88)	
23	BEING IN LOVE MAKES PEOPLE FEEL TOTALLY ALIVE	-.64
15	GENUINE LOVE INVOLVES SOLID, DEEP AFFECTION	-.62
6	LOVE CREATES MEMORIES THAT CAN BE REPLAYED AND ENJOYED OVER	-.62
14	FAITHFULNESS ESSENTIAL TO THE SUCCESS OF A LOVE RELATIONSHIP	-.57
31	EVERY LOVE IS UNIQUE	-.54
38	LOVE DOES NOT MAKE BLIND, BUT MAKE FORGIVE WHAT NORMALLY NOT	-.51
45	MORE THAN SEX, EMOTIONAL COMMITMENT IS THE OBSESSION OF LOVE	-.50
26	NOTHING MAKES FEEL MORE ALIVE THAN BEING IN LOVE	-.46
5	WHEN IN LOVE EVERYTHING REMINDS YOU OF PERSON YOU LOVE	-.44
28	LOVE MAKES SEE BEAUTY EVEN THINGS WOULDN'T ORDINARILY LIKE	-.42
7	FEELING LOVE EASY, MAKING SUCCEED IS VERY HARD WORK	-.41
49	LOVE MAKES VALUE THINGS IN SELVES THINK CAUSED THE LOVE	-.39
39	MOST PEOPLE ARE ONLY IN LOVE A FEW TIMES IN THEIR LIVES	-.39
22	TIME MOVES FASTER WHEN YOU ARE IN LOVE	-.39
3	LOVE IS FEELING THAT LOVED PERSON IS ALWAYS THERE FOR YOU	-.38
2	LOVE IS FIRM COMMITMENT TO MAKING RELATIONSHIP ENDURE	-.37
25	SOME INSTANCES MORE ALL-CONSUMING THAN OTHER INSTANCES	-.35
29	BEING IN LOVE MEANS DESPARATELY WANT BE LOVED IN RETURN	-.34
	F A C T O R III (Eigenvalue = 7.48)	
53	LOVE MAKES UNABLE TO CONCENTRATE ON ANYTHING BUT RELATIONSHIP	-.64
51	UNCERTAINTY ABOUT HOW LOVED ONE FEELS MAKE LOVE EVEN STRONGER	-.62
50	LOVE FEELING NOT IN CONTROL WHILE SOMEHOW NOT BEING AFRAID	-.59
48	SLIGHT REJECTIONS CAN GIVE RISE EVEN GREATER FEELINGS OF LOVE	-.58
47	LOVE USUALLY MAKES PEOPLE ECSTATICALLY HAPPY MISERABLY SAD	-.57
43	LOVE INVOLVES MAKING EVERYTHING REMIND YOU OF LOVED ONE	-.56
17	LOVE INVOLVES INABILITY THINK THINGS NOT INVOLVE LOVED ONE	-.55
55	FEAR OF REJECTION WHAT MAKES LOVE BOTH PAINFUL AND EXCITING	-.55
46	LOVE DAYDREAM ONLY ABOUT EVENTS INVOLVE EXCHANGE COMMITMENT	-.55
27	LOVE MAKES YOU FEEL AFRAID AND EVEN PHYSICALLY WEAK	-.54
42	LOVE MEANS THINKING ALMOST CONSTANTLY OF LOVED ONE	-.50
40	PEOPLE TRULY LOVE SEE VISIONS MORE THAN REALITY OF ONE LOVED	-.50
54	TRUE LOVE CAN MAKE PEOPLE USED FEEL ATTRACTIVE BEGIN TO WORRY	-.50
13	MOST PEOPLE USUALLY FIND LOVE PEOPLE NEVER EXPECTED TO LOVE	-.49
30	LOVE MAKES PEOPLE THINK CONSTANTLY ABOUT PERSON WHO IS LOVED	-.48
34	LOVE MAKES EVERYTHING ELSE SEEM LESS SIGNIFICANT	-.48
4	LOVE IS WANT BE ABLE THINK OTHER THINGS BUT HURT TOO MUCH	-.47
52	TRUEST FORMS OF LOVE ALL-CONSUMING AND TOTAL	-.46
32	FEELING LOVED ONE INATTENTIVE CAN MAKE FEEL LOVE EVEN MORE	-.43
5	WHEN IN LOVE EVERYTHING REMINDS YOU OF PERSON YOU LOVE	-.43
20	LOVE MAKES EVERYTHING LOVED PERSON DOES SEEM FAVORABLE GOOD	-.42
35	LOVE BLINDS ONE TO TRUTH ABOUT PERSON WHO IS LOVED	-.40
19	CENTER OF WORLD ALWAYS MUST BE PERSON WHO IS LOVED	-.36

49	LOVE MAKES VALUE THINGS IN SELVES THINK CAUSED THE LOVE	-.34
18	LOVE IS UNCONTROLLABLE	-.33
37	LOVERS PICK ONE OR TWO FEATURES THAT ESPECIALLY LIKE	-.33
28	LOVE MAKES SEE BEAUTY EVEN THINGS WOULDN'T ORDINARILY LIKE	-.33
26	NOTHING MAKES FEEL MORE ALIVE THAN BEING IN LOVE	-.32
29	BEING IN LOVE MEANS DESPARATELY WANT BE LOVED IN RETURN	-.31
	F A C T O R IV (Eigenvalue = 1.50)	
13	MOST PEOPLE USUALLY FIND LOVE PEOPLE NEVER EXPECTED TO LOVE	.44
7	FEELING LOVE EASY, MAKING SUCCEED IS VERY HARD WORK	.36
8	LOVE IS ACT OF WILL OR DECISION MORE THAN A FEELING	.36
40	PEOPLE TRULY LOVE SEE VISIONS MORE THAN REALITY OF ONE LOVED	-.36
	F A C T O R V (Eigenvalue = 2.67)	
10	LOVE IS BASICALLY PHYSICAL OR SEXUAL	-.49
36	POSSIBILITY OF SEX IS ESSENTIAL TO TRULY BEING IN LOVE	-.49
21	LOVE IS LOOKS AND PHYSICAL APPEARANCES MORE THAN TOUCHES	-.47
33	LOVE MAKES SEE MEANINGS EVEN WHEN HAVE NO SPECIAL MEANINGS	.42
19	CENTER OF WORLD ALWAYS MUST BE PERSON WHO IS LOVED	-.40
1	SEX MAKE PERSON FEEL IN LOVE WITH THE LOVER	-.39
17	LOVE INVOLVES INABILITY THINK THINGS NOT INVOLVE LOVED ONE	-.32
20	LOVE MAKES EVERYTHING LOVED PERSON DOES SEEM FAVORABLE GOOD	-.30
	F A C T O R 1 (Eigenvalue = 1.97)	
42	LOVE MEANS THINKING ALMOST CONSTANTLY OF LOVED ONE	.54
30	LOVE MAKES PEOPLE THINK CONSTANTLY ABOUT PERSON WHO IS LOVED	.49
43	LOVE INVOLVES MAKING EVERYTHING REMIND YOU OF LOVED ONE	.48
53	LOVE MAKES UNABLE TO CONCENTRATE ON ANYTHING BUT RELATIONSHIP	.40
20	LOVE MAKES EVERYTHING LOVED PERSON DOES SEEM FAVORABLE GOOD	.37
19	CENTER OF WORLD ALWAYS MUST BE PERSON WHO IS LOVED	.33
41	LOVE IS BEING ABLE SAY ANYTHING AND KNOWING IT BE LISTENED TO	.31
5	WHEN IN LOVE EVERYTHING REMINDS YOU OF PERSON YOU LOVE	.30
	F A C T O R 2 (Eigenvalue = 1.03)	
3	LOVE IS FEELING THAT LOVED PERSON IS ALWAYS THERE FOR YOU	.49
2	LOVE IS FIRM COMMITMENT TO MAKING RELATIONSHIP ENDURE	.39
15	GENUINE LOVE INVOLVES SOLID, DEEP AFFECTION	.36
14	FAITHFULNESS ESSENTIAL TO THE SUCCESS OF A LOVE RELATIONSHIP	.36
6	LOVE CREATES MEMORIES THAT CAN BE REPLAYED AND ENJOYED OVER	.34
	F A C T O R 3 (Eigenvalue = 0.93)	
48	SLIGHT REJECTIONS CAN GIVE RISE EVEN GREATER FEELINGS OF LOVE	.51
32	FEELING LOVED ONE INATTENTIVE CAN MAKE FEEL LOVE EVEN MORE	.50
51	UNCERTAINTY ABOUT HOW LOVED ONE FEELS MAKE LOVE EVEN STRONGER	.45
	F A C T O R 4 (Eigenvalue = 0.73)	
8	LOVE IS ACT OF WILL OR DECISION MORE THAN A FEELING	.48
12	TRUE LOVE REQUIRES SERIOUS EFFORT BE CONSIDERATE THOUGHTFUL	.46
	F A C T O R 5 (Eigenvalue = 0.84)	
9	FEELINGS OF LOVE ARE ALWAYS TRULY PERMANENT	.46
24	FEELINGS OF BEING IN LOVE CANNOT LAST FOREVER	-.42
25	SOME INSTANCES MORE ALL-CONSUMING THAN OTHER INSTANCES	-.40
	F A C T O R 6 (Eigenvalue = 0.55)	

10 LOVE IS BASICALLY PHYSICAL OR SEXUAL	-.36
36 POSSIBILITY OF SEX IS ESSENTIAL TO TRULY BEING IN LOVE	-.34
F A C T O R 7 (Eigenvalue = 0.75)	
44 I HAVE EXPERIENCED LOVE AT FIRST SIGHT	.58
16 LOVE AT FIRST SIGHT IS REAL	.50
F A C T O R 8 (Eigenvalue = 1.09)	
11 LOVE DOES'T MAKE SENSE, JUST EXIST OR DOESN'T	.64
18 LOVE IS UNCONTROLLABLE	.48
F A C T O R 9 (Eigenvalue = 1.06)	
28 LOVE MAKES SEE BEAUTY EVEN THINGS WOULDN'T ORDINARILY LIKE	-.44
21 LOVE IS LOOKS AND PHYSICAL APPEARANCES MORE THAN TOUCHES	.41
35 LOVE BLINDS ONE TO TRUTH ABOUT PERSON WHO IS LOVED	-.32
31 EVERY LOVE IS UNIQUE	-.32
F A C T O R 10 (Eigenvalue = 0.90)	
55 FEAR OF REJECTION WHAT MAKES LOVE BOTH PAINFUL AND EXCITING	.44
54 TRUE LOVE CAN MAKE PEOPLE USED FEEL ATTRACTIVE BEGIN TO WORRY	.38
33 LOVE MAKES SEE MEANINGS EVEN WHEN HAVE NO SPECIAL MEANINGS	-.36
F A C T O R 11 (Eigenvalue = 0.93)	
45 MORE THAN SEX, EMOTIONAL COMMITMENT IS THE OBSESSION OF LOVE	-.46
38 LOVE DOES NOT MAKE BLIND, BUT MAKE FORGIVE WHAT NORMALLY NOT	-.45
39 MOST PEOPLE ARE ONLY IN LOVE A FEW TIMES IN THEIR LIVES	-.33
F A C T O R 12 (Eigenvalue = 0.82)	
37 LOVERS PICK ONE OR TWO FEATURES THAT ESPECIALLY LIKE	-.56
39 MOST PEOPLE ARE ONLY IN LOVE A FEW TIMES IN THEIR LIVES	-.32
F A C T O R 13 (Eigenvalue = 0.46)	
35 LOVE BLINDS ONE TO TRUTH ABOUT PERSON WHO IS LOVED	.32
F A C T O R 14 (Eigenvalue = 0.75)	
22 TIME MOVES FASTER WHEN YOU ARE IN LOVE	.50
23 BEING IN LOVE MAKES PEOPLE FEEL TOTALLY ALIVE	.36

Note. Second-order factors are labelled with Roman numerals I to V. Orthogonalized first-order factors are labelled with numbers 1 to 14. Items were presented as complete sentences.

Table 7
Factor Interpretation Guide

Second-order Factor	First-order Factor	Stru Coef	Trace	h^2
III. Consumate Obsession (7.48)	3 Exciting Uncertainty	-.75	(0.93 -	61%)
	1 Obsession	-.72	(1.97 -	65%)
	12 Focused Love	.65	(0.82 -	55%)
	10 Love Fears	-.60	(0.90 -	58%)
	8 Love Irrationality*	-.45	(1.09 -	41%)
II. Committed Affect (4.88)	11 Committed Love	.72	(0.93 -	57%)
	2 Omnipresence	-.71	(1.03 -	62%)
	14 Love Exhilaration	-.64	(0.75 -	58%)
	9 Love Illusion	.43	(1.06 -	39%)
V. Sexual Love (2.67)	6 Sexual Love	.83	(0.55 -	70%)
I. Impressionistic Love (1.81)	7 Love at First Sight	.64	(0.75 -	50%)
	5 Love Permanancy	-.58	(0.84 -	50%)
IV. Willed Love (1.50)	13 Love Distorts	-.82	(0.46 -	71%)
	4 Effortful Love	.56	(0.73 -	57%)
	8 Love Irrationality*	.33	(1.09 -	41%)

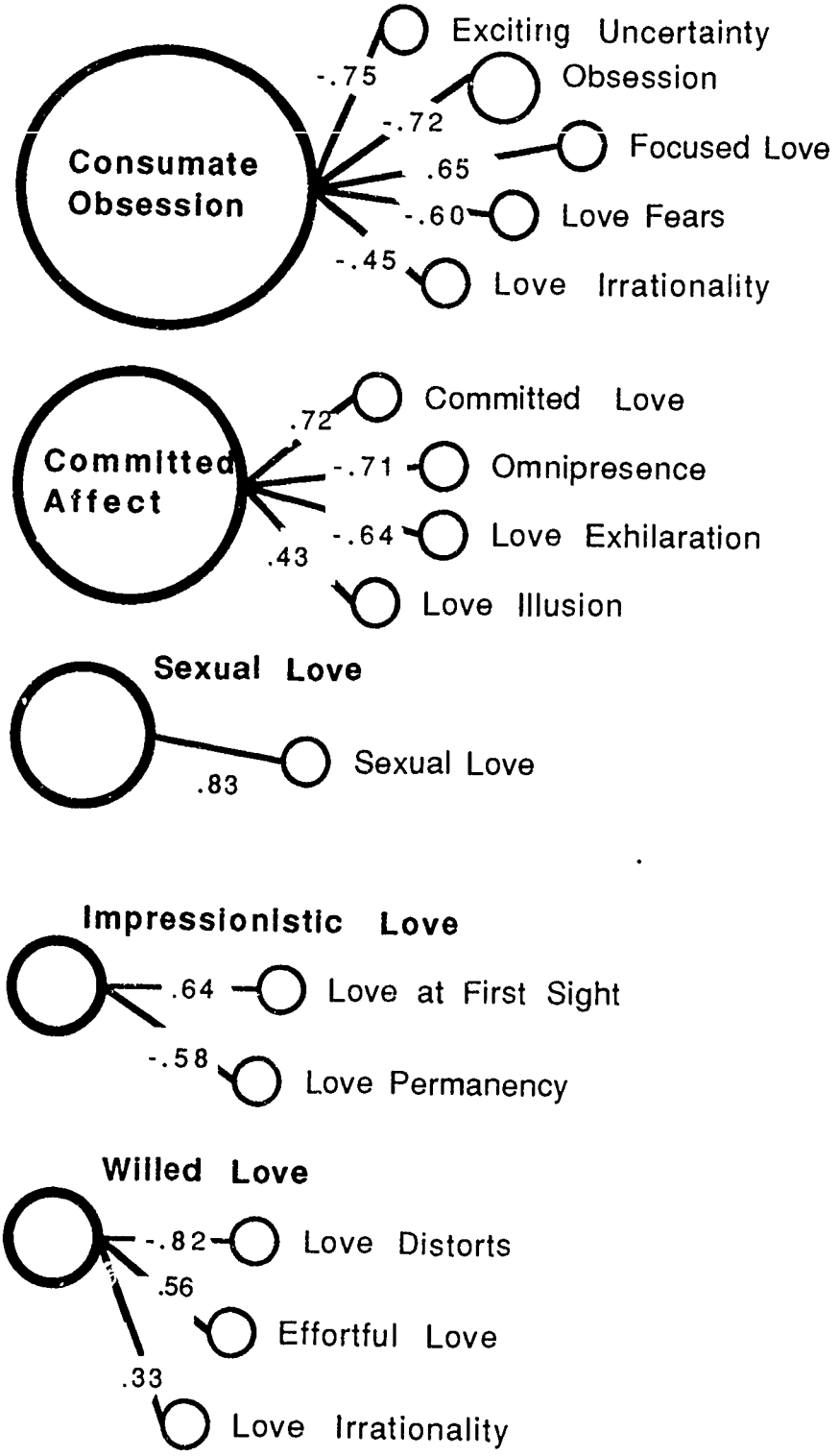
Note. The trace for each second-order factor in the Schmid-Leiman solution is presented in parentheses below each second-order factor name. The structure coefficients for each orthogonalized first-order factor from Table 2 is presented next to the factor number and name. In parenthesis following these structure coefficients is the trace for the factor from the Schmid-Leiman solution reported in Table 4 and the communality coefficient for each first-order factor, as reported in Table 2 and representing the percentage of each first-order factor's variance that is reproduced within the second-order factors reported in Table 2.

*
Indicates a first-order factor which was salient to more than one second-order factor.

Figure Caption

Figure 1
A Map of Culturally Defined Stereotypic Love

Note. Second-order factors are presented to the left using darker lines and the size of the circles is roughly proportional to the proportion of trace accounted for by each factor, as reported by eigenvalue statistics reported in Table 4. The path coefficients linking each orthogonalized first-order factor to the second-order factors are the structure coefficient reported for each factor in Table 2.


Consumate Obsession
-.75
-.72
.65
-.60
-.45
Exciting Uncertainty
Obsession
Focused Love
Love Fears
Love Irrationality
Committed Affect
.72
-.71
-.64
.43
Committed Love
Omnipresence
Love Exhilaration
Love Illusion
Sexual Love
.83
Sexual Love
Impressionistic Love
.64
-.58
Love at First Sight
Love Permanency
Willed Love
-.82
.56
.33
Love Distorts
Effortful Love
Love Irrationality

APPENDIX A:
LOVE RELATIONSHIPS SCALE

The Love Relationships Scale is attached. Permission for use of the measure in not-for-profit research is granted, contingent upon users sending both copyright co-owners copies of papers or articles resulting from use.

LOVE RELATIONSHIPS SCALE

GENERAL INSTRUCTIONS: On the left side of the answer sheet code in your SEX ("M" or "F"). Then code in your GRADE ("13" = freshman; "14" = sophomore, etc.). Then code in the YR for your BIRTH DATE.

PART A

Instructions: Respond to each of the following items on a 1 to 10 scale to shows how true you believe each statement is. "1" means that you believe a statement is completely true. "10" means that you believe a statement is completely untrue. "5" or "6" mean you believe a statement is partially true and partially false.

Example:

ITEM: It will rain next Thursday.
RESPONSE: "3"
This person felt pretty certain that the statement is true.

"1" = DEFINITELY COMPLETELY TRUE
to
"10" = DEFINITELY COMPLETELY UNTRUE

1. Sex always makes a person feel in love with the lover.
2. Love is firm commitment to making a relationship endure.
3. Love is feeling that the person that is loved is always there for you.
4. Love is wanting to be able to think of other things than the person you love but knowing that it would hurt too much to do so.
5. When you're really in love, it seems like everything reminds you of the person you love.
6. Love creates memories that can be "replayed" and enjoyed over and over again.
7. Feeling love is easy, making love succeed is very hard work.
8. Love is an act of will or a decision more than a feeling.
9. The feelings of true love are always permanent.
10. Love is basically physical or sexual.
11. Love does not make sense, it just exists or doesn't exist.
12. True love requires serious effort to be considerate and thoughtful.
13. Most people, when they find themselves in love, usually find themselves in love with people they would never have expected to love.
14. Faithfulness is essential to the success of a love relationship.
15. Genuine love involves solid, deep affection.

"1" = DEFINITELY COMPLETELY TRUE
to
"10" = DEFINITELY COMPLETELY UNTRUE

16. "Love at first sight" is real.
17. Love involves a consuming inability to think about things that do not involve the one who is loved.
18. Love is uncontrollable.
19. The center of the world always must be the person who is loved.
20. Love makes everything the loved person does seem favorable and good.
21. Love is looks and physical appearance more than touches.
22. Time moves faster when you are in love.
23. Being in love makes people feel totally alive.
24. The feelings of being "in love" cannot last forever.
25. Some instances of being in love are more all-consuming and controlling than other instances of being in love.
26. Nothing makes people feel more alive than being in love.
27. Love makes you feel afraid and even physically weak.
28. Love makes people see beauty even in things they wouldn't ordinarily like about the loved one.
29. Being in love always means wanting desparately to be loved in return.
30. Love makes people think constantly about the person who is loved.
31. Every love is unique.
32. Feeling that my loved one is being inattentive or unaccepting can even make me feel love even more strongly.
33. Love makes people see meanings in the actions of the loved one even when the actions may have no special meanings.
34. Being in love makes everything else in life seem less significant.
35. Love blinds one to truth about the person who is loved.
36. The possibility of sex is essential to truly being in love.
37. Lovers usually pick one or two physical or personality features of their loved ones they especially like.
38. Love does not blind, but it can make one forgive characteristics of the loved one that one normally would never forgive.
39. Most people are only in love a few times in their lives.
40. People who are truly in love see visions more than the reality of the one who is loved.
41. Being in love is being able to say anything to the loved one and knowing that it will be listened to.
42. Being in love means thinking almost constantly of the loved one.
43. Love involves making everything remind you of your loved one.
44. I have experienced "love at first sight."
45. More than sex, emotional commitment is the obsession of people in love.
46. People in love daydream only about events that involve the exchange of commitment.
47. Feeling in love usually makes people both ecstatically happy and miserably sad.

"1" = DEFINITELY COMPLETELY TRUE
to
"10" = DEFINITELY COMPLETELY UNTRUE

48. Sometimes slight rejections by the loved one can give rise to even greater feelings of love.
49. Being in love makes people especially value the things in themselves that they think caused the love.
50. Being in love is basically feeling "not in control" while somehow not being afraid.
51. Surprisingly, uncertainty about how the loved one feels can make feelings of love even stronger.
52. The truest form of love is all-consuming and total.
53. Love makes people unable to concentrate on anything but the love relationship.
54. True love can make people who used to feel very attractive begin to worry about whether they are really attractive with the person who really counts.
55. Fear of rejection is what makes love both painful and exciting.