Reading Attitudes of the Students of Polytechnic University of the Philippines: A Principal Component Factor Analysis

JOSEPH MERCADO
JACKIE D. URRUTIA
LINCOLN A. BAUTISTA
JOHN MICHAEL E. BORIGAS
DIANE A. ELGARAN
Polytechnic University of the Philippines
The Philippines

Abstract:

> The purpose of the study is to determine the underlying dimension or factor of reading attitudes of the Polytechnic University of the Philippines students using the method of Principal Component Factor Analysis. A total of 300 respondents from different colleges of the said university are included in the study. There is no restriction in age and year level but it is required that the respondents are enrolled in the university. The study made use of research instrument in order to measure the reading attitudes of the students. A 30 item Likert scale was used with 5 levels of agreement. The results show that there are more female respondents that participated in the study, mostly are in the age group of 18-20 years old and freshmen students. Kaiser-Meyer-Olkin test of Sampling Adequacy and Bartlett test of Sphericity shows significant results that factor analysis is appropriate in the data gathered. Therefore factor analysis is applicable. The method of factor analysis extracted four factors of reading attitudes, namely, love for reading as the first factor, skills in reading for the second factor, social interaction for the third factor, and benefit of reading for the fourth factor.

Key words: Kaiser-Meyer-Olkin, Factor Analysis, Reading Attitudes, Bartlett Test of Sphericity, Test of Sampling Adequacy

Introduction

Reading is a means of communication. It is an element of freedom where the society develops. The society, the people in this unit, has the ability to elaborate existing knowledge and produce another. This knowledge is gained through reading, transfers the knowledge, experience and observation in the means of writing. Reading is amongst the most crucial determinants in developing an individual's vision that shapes his or her personality and that makes him or her become closer to other individuals. Reading makes individuals truly free and protects them from ignorance and false beliefs [1].

Reading attitudes is a system of feelings related to reading which causes the learner to approach or avoid a reading situation. It is a state of mind, accompanied by feelings and emotions that make reading more or less probable [2].

Thus, the purpose of this study is to determine the factors which assess the reading attitudes of the students of Polytechnic University of the Philippines for it is essential not only in studying as well as part of a day-to-day routine of a person.

1.1 Objective of the Study

The objective of the study is to determine the reading attitudes of the students of Polytechnic University of the Philippines using a 30-item survey on reading attitudes and categorize the factors extracted using the method of principal component factor analysis.

Figure 1. Research Paradigm

INPUT		PROCESS		OUTPUT
Profile	Feed back	Percentage and Frequencies		Segmented Factors directly related to Students' Reading Attitudes
30-Item Students' Reading Attitude		Factor Analysis		
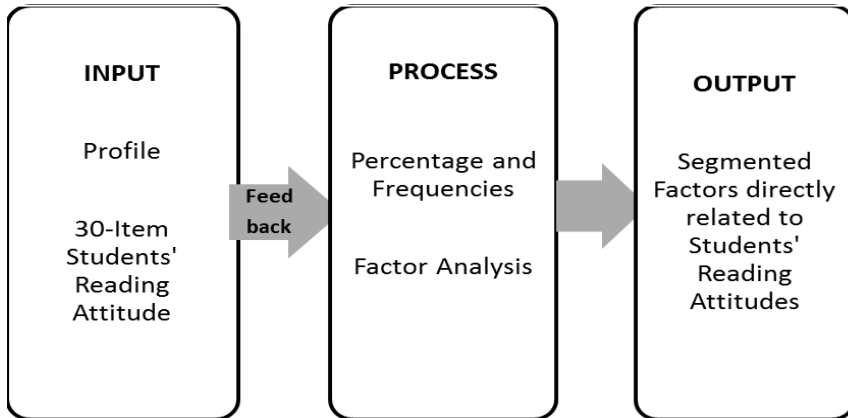
1.2 Statement of the Problem

This study was conducted to determine the underlying factors on reading attitudes among the students of Polytechnic University of the Philippines. Specifically, this study seeks to answer the following:

1. What is the profile of the respondents in terms of:
   1.1 Age;
   1.2 Sex;
   1.3 Year level; and
   1.4 College?
2. What are the underlying dimensions or factors of reading attitudes?

1.3 Scope and Limitation

The study was limited only to students enrolled at Polytechnic University of the Philippines, Sta. Mesa, Manila, during school year 2014-2015. 300 students from different year level and colleges were considered to participate in the attitudinal survey. The factors covered were also limited to the 30-item

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attitudes included in the survey instrument. All data gathered
is based on the immediate perception of the respondents during
the collection of the data. The researchers will not be liable for
any changes in data outside the data collection period.

Review of Related Literatures

The behavioural factor mostly affects the reading attitudes of
students and believed that reading reduces their stress,
engages their imagination, and is not a waste of time for
students who had positive attitudes towards reading. The more
students are exposed that reading is perceived as not stressful,
the more positive attitude and intention are likely to form [3].

A study conducted to mask the development of reading
attitude from childhood to adulthood. Result shows that
although childhood measures seem to be poor predictors of
adult attitude, there was evidence of stability in reading
attitude over time [2].

A research about reading habits and attitude was
conducted in a selected polytechnic school in Malaysia, 119
students from Engineering and Business were selected. Results
revealed that students have low interest in reading and
students do not enjoy reading as much as they enjoy doing
other technology related activities. They find reading as
difficult and causing reading anxiety. They also felt that there
are other ways to learn new things than by reading as they find
reading boring and not motivating [4].

A study whose main purpose is to determine the reading
habits of the tourism students in Balekisir University. There
have been six sub dimensions identified namely fondness of
reading, having the habit of reading, necessity if reading, desire
for reading, effect of reading and usefulness of reading [5].

Factor analyses indicated two stable and interpretable
factors for each age group: 3-year-olds showed "general reading"
and "library reading," 4-year-olds showed "general reading" and

"listening and library reading," and 5-year-olds showed "oral reading" and "library reading." [6]

It is found that students may exhibit positive attitude toward reading, they may not remain the engaged and might still need additional support. Preference for student choice was also visible trend during the interview. Choice allows students to select tasks and texts that they are interested in and find personally relevant [7].

Methodology

3.1. Sample
Three hundred students (158 female and 142 male) of Polytechnic University of the Philippines, Sta. Mesa, Manila, from different colleges and different year level, participated in this study. With age ranging from 15 to 32 (M age = 18.33). The year level is divided into five (99 first year, 62 second year, 58 third year, 62 fourth year, 8 fifth year and 11 with no response). There are thirteen colleges participated in the survey (35 for college of science, 8 for college of arts and letters, 7 for college of social science and development, 34 for college of computer and information sciences, 13 for college of architecture and fine arts, 45 for college of engineering, 46 for college of accountancy and finance, 1 for college of political science and public administration, 9 for college of tourism, hospitality and transformation management, 7 for college of human kinetics, 29 for college of communication, 13 for college of education, and 52 for college of business. A ratio of 10:1 (10 respondents per variable or questions) was used to compute for the total number of sample.

3.2. Instrumentation
The subjects of the study were given a 30-item questionnaire assessing reading attitudes, along with several questions for the profile of the students. The questionnaire was adapted from

the Adult Survey of Reading Attitudes, created by Smith in 1990, developed to measure reading attitudes of students. The questionnaire is a 5-point, Likert-type scale, where 5 represents strongly agree (SA), 4 for agree (A), 3 for uncertain (U), 2 for disagree (D), and 1 for strongly disagree (SD).

3.3. Statistical Tool

The researchers utilized Statistical Package for the Social Sciences (SPSS), a software packages for statistical analysis, for the extraction of underlying factors of reading attitudes using the method of principal component analysis.

3.4. Statistical Treatment

3.4.1. Factor Analysis

The study was limited only on students enrolled at PUP College of Science – Sta. Mesa, Manila, during school year 2014-2015. Only 300 freshmen students were considered to participate in the attitudinal survey. The factors covered were also limited to the 30-item attitudes included in the survey instrument. All data gathered is based on the immediate perception of the respondents during the collection of the data. The researchers will not be liable for any changes in data outside the data collection period.

Factor analysis has two general exploratory uses, namely explanation and data reduction. In explanation, underlying dimension is assessed by a particular measuring instrument. The procedure is called exploratory since the researchers has no firm or priori expectations based on theory or prior research about the composition of the subscales, and thus the analysis I used to discover the latent variables that underlie the scale. Factor analysis uses the matrix of correlations or covariances among measured variables, either items or subscales, to identify a set of more general latent variables, or factors. The analysis produces factor loadings,

which are regression weights for predicting the measured variables from latent variables, and also produces correlations among latent variables, if these are estimated. The second use of exploratory factor analysis is for data reduction, in which a set of measured variables is to be combined into summary indices. The goal is to discover optimal weightings can be reduced to a smaller set of general summary scores that have maximal variability and reliability.

Multivariate normality is a strict assumption only for certain methods of parameter estimation, such as maximum likelihood. Since principal axes (least squares), which is by far the most commonly used approach for exploratory factor analysis, does not require the assumption of multivariate normality.

3.4.2. Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) and Bartlett Test of Sphericity

Table 1 Kaiser-Meyer-Olkin Criterion

KMO Value	Degree of Common Variance
0.91 and above	Superb
0.81 - 0.9	Great
0.71 - 0.8	Good
0.5 - 0.7	Mediocre
0.49 and below	Don't factor

Kaiser Meyer Olkin Measure of Sampling Adequacy measures the factorability of the data. KMO statistics varies between 0 and 1. A value of 0 indicates that the sum of partial correlations is large relative to the sum of the correlations, indicating diffusion in the pattern of correlations (hence, factor analysis is likely to be inappropriate). A value close to 1 indicates that patterns of correlations are relatively compact and so factor analysis should yield distinct and reliable factors. Kaiser (1974) recommends accepting values greater than 0.5 as acceptable. Furthermore, values between 0.5 and 0.7 are called mediocre,

values between 0.7 and 0.8 are good, values between 0.8 and 0.9 are great and values above 0.9 are superb [8].

Bartlett's measure tests the null hypothesis that the correlation matrix is an identity matrix. For factor analysis to work, relationships between variables and is the R-matrix were an identity matrix then all correlation coefficients would be zero. Therefore, the test must be significant (significance value less than 0.05). A significant result tells us that the R-matrix is not an identity matrix, and therefore factor analysis is appropriate.

$$\chi^2 = -\left[(n-1) - \frac{1}{6}\left(2p + 1 + \frac{2}{p}\right)\right][\ln|S| + p\ln\left(\frac{1}{p}\right)\sum l_j]$$

$$with\ df = \frac{(p-1)(p-2)}{2}$$

where p = number of variables
k = number of components
l_j = jth eigenvalue of S

3.4.3. Principal Component Analysis (PCA)

Principal Component Analysis is a method of extraction in Factor Analysis, reduces the dimensions of the data into smaller and more significant dimensions, is one of the most commonly used approaches in exploratory factor analysis. It does not require the assumptions of multivariate normality. The communality of a variable is the variance that variable shares with the latent variables underlying the set of observed measures. PCA analyzes the matrix of correlations among measured variables with 1.0's on the main diagonal. PCA attempts to represents all of the variance of the observed variables. PCA uses the principal axes (or unweighted least squares) method of estimating factors from the correlation matrix of measured variables to extract components that account for the maximum possible variance in the observed variables. The first component or factor is extracted so that it

produces the highest possible squared correlations between the variables and the component or factor and thus maximizes the amount of variance accounted for. In most cases, the first component accounts for considerably more variance than all subsequent components. The method continues to extract as many components as variables in the analysis until either all of the variance of the measured variable is accounted for. Following extraction, the retained factors are usually rotated to simple structure to make them more interpretable. Simple structure is achieved when each variable loads highly on as few factors as possible, preferably each variable will have only one significant or primary loading.

Collected data were factor-analysed in order to extract the underlying dimensions of the reading attitude of the students. Kaiser (1974) suggests that only factors with an eigenvalue greater than 1 were accepted, and only items with factor loadings and communalities greater that 0.4 were included in the final factor structure. Also variables with value of greater than 0.05 in their significance a excluded in the analysis, this is for testing of multicollinearity, the significance are found in the correlation matrix [8].

Results and Discussion

4.1. Profile of the Respondents

Table 2. Age

Age Group	Frequency	Percent
15-17 years old	113	37.67
18-20 years old	159	53.00
21-23 years old	23	7.67
24 years old and above	2	0.67
No Response	3	1.00
Total	300	100.00

Table 2 shows the percentage distribution of the respondents' age group. Most of the respondents' age who participated in the

survey was between 18-20 years old with 53 percent of the total respondents. Age group 15-17 years old have 37.67 percent, 7.67 percent for the age group 21-23 years old; and 0.67 percent for age group 24 years old and above.

Table 3. Sex

Sex	Frequency	Percent
Female	158	52.67
Male	137	45.67
No Response	5	1.67
Total	300	100.0

Table 3 shows that percentage distribution of the respondents' sex. 52.67 percent of respondents were female students while 45.67 percent were male students.

Table 4. Year Level

Year	Frequency	Percent
First	99	33.00
Second	62	20.67
Third	58	19.33
Fourth	62	20.67
Fifth	8	2.67
No Response	11	3.67
Total	300	100.0

Table 4 shows that 33 percent of the participants were first year students, both second year and fourth year were 20.67 percent of the total participants, 19.33 percent were third year students and 2.67 percent were fifth year students.

Table 5. Colleges

Colleges	Frequency	Percent
Science	35	11.67
Arts and Letters	8	2.67
Social Science and Development	7	2.33
Computer and Information Sciences	34	11.33
Architecture and Fine Arts	13	4.33
Engineering	45	15.00
Accountancy and Finance	46	15.33

Political Science and Public Administration	2	0.67
Tourism, Hospitality and Transportation Management	9	3.00
Human Kinetics	7	2.33
Communication	29	9.67
Education	13	4.33
Business	52	17.33
Total	300	100.00

Table 5 shows the percentage distribution of the respondents' colleges. College of Business have 17.33 percent of the total respondents, 15.33 percent for the College of Accountancy and Finance, 15 percent for the College of Engineering, College of Science and College of Computer and Information Sciences have 11.67 percent and 11.33 percent respectively.

4.2. Factor Analysis

4.2.1 Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) and Bartlett Test of Sphericity

Table 6. KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.942
Bartlett's Test of Sphericity	Approx. Chi-Square	4037.273
	df	351
	Sig.	0.000

In order to determine whether or not it is possible to carry out a factor analysis on data acquired from 300 students using the 30 Item Reading Attitude Questionnaire. A Preliminary test has been made. First is the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO). The achieved result for the KMO statistics is 0.942. A Value of greater than .90 indicates a perfect level of data to carry out a factor analysis [9]. The second test is called Bartlett Test of Sphericity, the chi square value is 4037.273 and with a P-value of .000. The P-value show that we reject the null hypothesis, there is no sufficient

correlations exist among the variables to proceed factor analysis, since rejection of the null indicates there exist a correlation among the variables, we can now proceed to factor analysis. The outcomes of the two tests testify the appropriateness of the data acquired for a factor analysis.

4.2.2. Principal Component Method

Principal component analysis was used as the extraction method for factor analysis. After the extraction method it has been observed that, the 27 items (variables) which have been included in the analysis, are grouped into smaller dimensions. Five factors are extracted, where as the first factor contributes 40.386 of the total variance, followed by 6.746, 5.932, 4.194, and 3.799. Almost every variable are found in the first factor, this explain why the other factor got the lowest variance shared. In order to synthesize the problem, factor rotation is applied, rotation allows them to maximize and minimize the variance in the entire factor to create a more reliable factor output. After factor rotation, the variance shared by every factor are minimized and mostly maximized. Now, the first factor represents 23.238 percent of the total variance shared. Followed by 13.488 percent for the second factor, 11.625 for the third factor, and lastly 6.562 for the fourth factor. The four factor structure explains the 61.058 percent of the total variance and eigenvalue above 1. It has been determined that 11 items are under the first factor, 6 items for the second factor and third factor, and 2 items for the fourth factor. (See Appendix C)

Table 7: Factor loadings of items for each factor

Table 7.1 First Factor

Love for Reading	
11. Reading is one of my favourite activities.	.819
29. I spend a lot of my spare time reading.	.787
9. When I am at home I read a lot.	.775

13. I read a lot.	.775
25. Reading is one of the most interesting things which I do.	.734
12. I want to have more books of my own.	.725
18. I get a lot of enjoyment from reading.	.642
27. I'm the kind of person who enjoys a good book.	.637
26. When I read I don't get tired and sleepy.	.539
21. I like going to the library for books.	.533
30. I enjoy receiving books as gifts.	.482

Table 7.2 Second Factor

Skills in Reading	
15. I can remember easily what I read.	.772
14. I can read very well.	.765
6. I understand what I've read.	.650
20. I'm confident about my reading.	.635
7. I am a good reader.	.619
28. I enjoy it when someone asks me to explain unfamiliar words or ideas to them.	.492

Table 7.3 Third Factor

Social Interaction in Reading	
5. Whenever my friends read a good book, they usually tell me about it.	.716
22. When I read an interesting book, story, or article I like to tell my friends about it.	.708
8. My friends enjoy having me tell them about the books that I read.	.685
24. I like to listen to other people talk about the books they have read.	.555
17. My friends and I often discuss the books we have read.	.525
3. I get a lot of satisfaction when I help other people with their reading problems, or when I read to others.	.467

Table 7.4 Fourth Factor

Benefit of Reading	
10. Reading is one of the best ways for me to learn things.	.683
1. I learn better when I read.	.668

The next step after the factor extraction, the factors are then named according to the variables under each latent dimension. And due to lack of relevance of the variables under the fifth factor, the factor is then eliminated. Therefore only four factors of reading attitude remained. The four factors are consulted to professionals and named appropriately according to their similarities, relevance to each other, and key words. Now, the

factors are known in their distinct factor names. Namely, the first factor as Love for reading, the second factor as the Skills in reading, the third factor as the Social interaction in reading, and lastly, the fourth factor as the Benefit of reading.

Conclusions and Recommendations

5.1 Conclusions

It was seen at the end of the study that reading attitudes of the Polytechnic University of the Philippines students are sub divided into 4 factors. The four factors under reading attitudes in this study are: Love for Reading, Skills in Reading, Social Interaction in Reading, and Benefit of Reading. The results also shows that more variables are found in the first factor, compared to other factors, factor 4 shares only two variables. The results also shows that reading is very essential in learning, to be exact, reading and learning are two categories that work hand in hand in the development of the students. Therefore, the study shows that it is indeed important to redefine measures of reading attitudes in order in redefine measurement of learning of the students not only in tertiary level but throughout different academic level.

5.2 Recommendations

The researchers suggest that it is vital to determine the extent of reading attitudes of the students, because reading attitudes shows how and what are the reason for the students to read. With the help of the reading attitudes, the habit of the students in reading is defined. It is also suggested to ensure a more accurate and precise instrument in measuring reading attitudes, therefore, the researchers suggests to enclose an instrument with more variables that not only measures a self evaluation of the reading attitudes of an individual, thus, an instrument that also measures social intervention with the family, relatives, friends and even teachers are highly

suggested. Because in this study, results shows that social reinforcement influence the reading behaviour of the students. The researchers also suggest the use of in depth analysis using the factors extracted by factor analysis. Usage of in depth analysis will show a variety of results that will show the importance and contribution of reading attitudes to present generation. And it is highly suggested to measure the reading attitudes of the student using their sex, year level, course or colleges, and the age group as the grouping variable to show understanding of how different individual cope with different reading attitudes.

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FINAL QUESTIONAIRE

"Reading Attitudes of the Students of Polytechnic University of the Philippines, Sta. Mesa Manila: A Principal Component Analysis"

Part 1: Profile of the Students

Directions: Answer the following questions truthfully and honestly. The information gathered are all for academic use only and will remain private.

Name: _____

_____ (optional)

Age: _____ Sex: _____

Course: _____ Year: _____

Part 2: READING ATTITUDES SURVEY

Please read each of the statements carefully. After you read each statement, decide if you agree or disagree with the statement. Following each statement is a scale from 5 to 1. Check the column that corresponds to the following symbols.

Check column **5** if you **STRONGLY AGREE (SA)** with the statement.

Check column **4** if you **AGREE (A)** with the statement.

Check column **3** if you are **UNCERTAIN (U)** in how you feel about the statement.

Check column **2** if you **DISAGREE (D)** with the statement.

Check column **1** if you **STRONGLY DISAGREE (SD)** with the statement.

THERE ARE 30 STATEMENTS. PLEASE RESPOND TO EACH ONE. CHECK ONLY ONE SCALE PER QUESTION.

	5	4	3	2	1
	SA	A	U	D	SD
1. I learn better when I read.					
2. I don't need help in reading.					
3. I get a lot of satisfaction when I help other people with their reading problems, or when I read to others.					
4. I get upset when I think about having to read.					
5. Whenever my friends read a good book, they usually tell me about it.					
6. I understand what I've read.					
7. I am a good reader.					
8. My friends enjoy having me tell them about the books that I read.					
9. When I am at home I read a lot.					
10. Reading is one of the best ways for me to learn things.					
11. Reading is one of my favourite activities.					
12. I want to have more books of my own.					
13. I read a lot.					
14. I can read very well.					
15. I can remember easily what I read.					
16. Encountering unfamiliar words is my favourite part of reading.					
17. My friends and I often discuss the books we have read.					
18. I get a lot of enjoyment from reading.					
19. I would rather read what to do than to have someone tell me what to do.					
20. I'm confident about my reading.					
21. I like going to the library for books.					
22. When I read an interesting book, story, or article I like to tell my friends about it.					
23. It is easier for me to understand what I am reading if pictures, charts, and diagrams are included.					
24. I like to listen to other people talk about the books they have read.					
25. Reading is one of the most interesting things which I do.					
26. When I read I don't get tired and sleepy.					
27. I'm the kind of person who enjoys a good book.					
28. I enjoy it when someone asks me to explain unfamiliar words or ideas to them.					
29. I spend a lot of my spare time reading.					
30. I enjoy receiving books as gifts.					

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Appendix A. Correlation and Significance Matrix

Correlation Matrix[a]

Correlation

	Q1	Q3	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22	Q24	Q25	Q26	Q27	Q28	Q29	Q30
Q1	1.000	.335	.259	.388	.409	.322	.230	.510	.360	.378	.355	.345	.367	.183	.171	.382	.293	.368	.147	.341	.283	.383	.298	.342	.256	.278	.130
Q3	.335	1.000	.188	.249	.211	.361	.243	.207	.254	.231	.258	.187	.135	.276	.334	.276	.238	.178	.229	.314	.299	.262	.178	.273	.250	.247	.130
Q5	.259	.188	1.000	.314	.255	.515	.291	.242	.301	.291	.287	.167	.170	.187	.368	.343	.214	.244	.201	.460	.318	.251	.318	.283	.196	.263	.165
Q6	.388	.249	.314	1.000	.504	.376	.249	.360	.338	.269	.321	.455	.492	.254	.243	.399	.292	.506	.203	.284	.304	.341	.350	.374	.308	.238	.118
Q7	.409	.211	.255	.504	1.000	.404	.399	.341	.472	.363	.533	.531	.492	.237	.307	.479	.302	.461	.345	.408	.348	.474	.420	.490	.366	.477	.176
Q8	.322	.361	.515	.376	.404	1.000	.388	.276	.338	.325	.380	.382	.260	.325	.514	.403	.323	.318	.299	.524	.286	.331	.411	.324	.347	.345	.110
Q9	.230	.243	.291	.249	.399	.388	1.000	.400	.716	.561	.698	.241	.302	.238	.360	.562	.353	.350	.440	.381	.312	.599	.488	.529	.237	.661	.305
Q10	.510	.207	.242	.360	.341	.276	.400	1.000	.558	.515	.473	.334	.300	.271	.262	.526	.413	.472	.207	.342	.342	.490	.375	.465	.261	.392	.163
Q11	.360	.254	.301	.338	.472	.338	.716	.558	1.000	.746	.765	.348	.398	.320	.412	.704	.482	.463	.459	.420	.391	.726	.509	.651	.341	.693	.341
Q12	.378	.231	.291	.269	.363	.325	.561	.515	.746	1.000	.712	.322	.379	.284	.383	.674	.415	.404	.430	.405	.364	.646	.426	.606	.320	.575	.261
Q13	.355	.258	.287	.321	.533	.380	.698	.473	.765	.712	1.000	.391	.408	.303	.434	.666	.435	.421	.437	.409	.360	.686	.504	.607	.338	.683	.283
Q14	.345	.187	.167	.455	.531	.382	.241	.334	.348	.322	.391	1.000	.589	.292	.237	.437	.280	.550	.189	.314	.240	.373	.291	.424	.338	.263	.135
Q15	.367	.135	.170	.492	.492	.260	.302	.300	.398	.379	.408	.589	1.000	.302	.207	.440	.317	.552	.302	.276	.202	.399	.369	.371	.387	.390	.188
Q16	.183	.276	.187	.254	.237	.325	.238	.271	.320	.284	.303	.292	.302	1.000	.377	.377	.265	.334	.289	.274	.295	.340	.306	.325	.401	.305	.039
Q17	.171	.334	.368	.243	.307	.514	.360	.262	.412	.383	.434	.237	.207	.377	1.000	.498	.350	.335	.371	.478	.365	.387	.383	.329	.281	.401	.079
Q18	.382	.276	.343	.399	.479	.403	.562	.526	.704	.674	.666	.437	.440	.377	.498	1.000	.507	.568	.448	.488	.430	.643	.478	.631	.422	.615	.295
Q19	.293	.238	.214	.292	.302	.323	.353	.413	.482	.415	.435	.280	.317	.265	.350	.507	1.000	.531	.389	.272	.167	.416	.363	.347	.282	.423	.189
Q20	.368	.178	.244	.506	.461	.318	.350	.472	.463	.404	.421	.550	.552	.334	.335	.568	.531	1.000	.306	.345	.321	.493	.389	.490	.401	.425	.206
Q21	.147	.229	.201	.203	.345	.299	.440	.207	.459	.430	.437	.189	.302	.289	.371	.448	.389	.306	1.000	.341	.306	.467	.410	.387	.304	.484	.136
Q22	.341	.314	.460	.284	.408	.524	.381	.273	.420	.405	.409	.314	.276	.274	.478	.488	.272	.345	.341	1.000	.525	.488	.373	.497	.392	.370	.177
Q24	.283	.299	.318	.304	.348	.286	.312	.342	.391	.364	.360	.240	.202	.295	.365	.430	.167	.321	.306	.525	1.000	.475	.315	.443	.352	.333	.170
Q25	.383	.262	.251	.341	.474	.331	.599	.490	.726	.646	.686	.373	.399	.340	.387	.643	.416	.493	.467	.488	.475	1.000	.564	.654	.382	.648	.298
Q26	.298	.178	.318	.350	.420	.411	.488	.375	.509	.426	.504	.291	.369	.306	.383	.478	.363	.389	.410	.373	.315	.564	1.000	.497	.387	.552	.239
Q27	.342	.273	.283	.374	.490	.324	.529	.465	.651	.606	.607	.424	.371	.325	.329	.631	.347	.490	.387	.497	.443	.654	.497	1.000	.491	.582	.292
Q28	.256	.250	.196	.308	.366	.347	.237	.261	.341	.320	.338	.338	.387	.401	.281	.422	.282	.401	.304	.392	.352	.382	.387	.491	1.000	.403	.175
Q29	.278	.247	.263	.238	.477	.345	.661	.392	.693	.575	.683	.263	.390	.305	.401	.615	.423	.425	.484	.370	.333	.648	.552	.582	.403	1.000	.335
Q30	.130	.130	.165	.118	.176	.110	.305	.163	.341	.261	.283	.135	.188	.039	.079	.295	.189	.206	.136	.177	.170	.298	.239	.292	.175	.335	1.000

Sig. (1-tailed)

	Q1	Q3	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22	Q24	Q25	Q26	Q27	Q28	Q29	Q30
Q1		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.002	.000	.000	.000	.007	.000	.000	.000	.000	.000	.000	.000	.015
Q3	.000		.001	.000	.000	.000	.000	.000	.000	.000	.000	.001	.012	.000	.000	.000	.000	.001	.000	.000	.000	.000	.001	.000	.000	.000	.015
Q5	.000	.001		.000	.000	.000	.000	.000	.000	.000	.000	.003	.002	.001	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.000	.003
Q6	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.025
Q7	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.002
Q8	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.033
Q9	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
Q10	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.003
Q11	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
Q12	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
Q13	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
Q14	.000	.001	.003	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.001	.000	.000	.000	.000	.000	.000	.000	.012
Q15	.000	.012	.002	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001
Q16	.001	.000	.001	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.259
Q17	.002	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.094
Q18	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
Q19	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.003	.000	.000	.000	.000	.000	.001
Q20	.000	.001	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000
Q21	.007	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.012
Q22	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.002
Q24	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.003	.000	.000	.000		.000	.000	.000	.000	.000	.002
Q25	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000
Q26	.000	.001	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000
Q27	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000
Q28	.000	.000	.001	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.002
Q29	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000
Q30	.015	.015	.003	.025	.002	.033	.000	.003	.000	.000	.000	.012	.001	.259	.094	.000	.001	.000	.012	.002	.002	.000	.000	.000	.002	.000	

a. Determinant = 2.74E-007

Appendix B. Kaiser-Meyer-Olkin Measure of Sampling Adequancy and Bartlett Tests of Sphericity

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.942
Bartlett's Test of Sphericity	Approx. Chi-Square	4037.273
	df	351
	Sig.	.000

Appendix C. Variance Shared and Extracted Factors

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	10.904	40.386	40.386	10.904	40.386	40.386	6.274	23.238	23.238
2	1.822	6.746	47.133	1.822	6.746	47.133	3.642	13.488	36.726
3	1.602	5.932	53.065	1.602	5.932	53.065	3.139	11.625	48.350
4	1.132	4.194	57.259	1.132	4.194	57.259	1.772	6.562	54.913
5	1.026	3.799	61.058	1.026	3.799	61.058	1.659	6.145	61.058
6	.998	3.697	64.754						
7	.880	3.261	68.015						
8	.821	3.042	71.057						
9	.714	2.645	73.702						
10	.708	2.622	76.325						
11	.636	2.354	78.679						
12	.576	2.133	80.812						
13	.542	2.006	82.818						
14	.477	1.768	84.586						
15	.473	1.754	86.340						
16	.443	1.641	87.980						
17	.422	1.563	89.543						
18	.396	1.465	91.009						
19	.376	1.391	92.399						
20	.327	1.210	93.609						
21	.293	1.086	94.695						
22	.284	1.050	95.745						
23	.273	1.012	96.757						
24	.263	.976	97.733						
25	.228	.843	98.576						
26	.210	.778	99.354						
27	.174	.646	100.000						

Extraction Method: Principal Component Analysis.

Appendix D. Component Matrix

Component Matrix[a]

	Component				
	1	2	3	4	5
Q18	.823				
Q11	.822				
Q25	.801				
Q13	.800				

Q27	.766				
Q29	.751				
Q12	.748				
Q9	.702	-.406			
Q20	.676				
Q26	.668				
Q7	.664				
Q22	.633		.417		
Q10	.623				
Q15	.587		-.413		
Q8	.585		.436		
Q19	.583				-.414
Q17	.577		.472		
Q21	.567				
Q14	.564	.457			
Q28	.559				
Q24	.557				
Q6	.549	.490			
Q1	.527			.478	
Q16	.483			-.434	
Q5	.459		.450		
Q3	.408				
Q30					.422

Extraction Method: Principal Component Analysis.

a. 5 components extracted.

Appendix E. Rotated Component Matrix

Rotated Component Matrix[a]

	Component				
	1	2	3	4	5
Q11	.819				
Q29	.787				
Q9	.775				
Q13	.775				
Q25	.734				
Q12	.725				
Q18	.642				
Q27	.637				
Q26	.539				
Q21	.533			.427	
Q30	.482				
Q15		.772			
Q14		.765			
Q6		.650			
Q20		.635			
Q7		.619			
Q28		.492			

Q5		.716		
Q22		.708		
Q8		.685		
Q24		.555		
Q17		.525		.498
Q3		.467		
Q10	.402		.683	
Q1			.668	
Q16				.631
Q19				.442

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.