Factor Analysis Modeling SAS Code

/\*Factor analysis - Step 1–Identifying optimum number of factors \*/

**proc** **factor** data = sashelp.heart method = principal rotate = varimax reorder

nfactors = **6** out = factdset;

var AgeAtStart Height Weight Diastolic Systolic MRW ;

**run**;

/\* Step 2 - After preliminary analysis, 3 factors have been selected based on eigen value > = 1 it is judgemental

so we have considered 3rd factor even it is slightly less than 1 \*/

**proc** **factor** data = sashelp.heart method = principal priors = smc rotate = varimax reorder

nfactors = **3** res method = ml heywood out = factdset;

var AgeAtStart Height Weight Diastolic Systolic MRW ;

**run**;

SAS Code Output Analysis

**In step 1**, (Complete SAS output can be found at the end of this document) we would like to identify number of factors may be enough. If we analyze the SAS output. We have used initial factor extraction method as principal (means PCA method). And thumb rule for extracting factors is Eigen value > = 1(Kaiser-Guttman rule). However it is bit judgemental, no hard and fast rule is there. Here we are selecting 3 factors

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| **Prior Communality Estimates: ONE** |

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| | **Eigenvalues of the Correlation Matrix: Total = 6 Average = 1** | | | | | | --- | --- | --- | --- | --- | |  | **Eigenvalue** | **Difference** | **Proportion** | **Cumulative** | | **1** | 2.60347936 | 1.09994784 | 0.4339 | 0.4339 | | **2** | 1.50353152 | 0.58059105 | 0.2506 | 0.6845 | | **3** | 0.92294047 | 0.15449450 | 0.1538 | 0.8383 | | **4** | 0.76844597 | 0.57474136 | 0.1281 | 0.9664 | | **5** | 0.19370461 | 0.18580654 | 0.0323 | 0.9987 | | **6** | 0.00789807 |  | 0.0013 | 1.0000 | |

Rotation used here is VARIMAX, which is nothing but orthogonal rotation. It is generally considered that using a rotation in factor analysis will produce more interpretable results. Orthogonal rotations retain uncorrelated factors; where as Oblique rotations create correlated factors. Orthogonal rotation often creates a solution that is easier to grasp and interpret than a solution obtained from an oblique rotation.

If we see the difference between before and after rotation carefully, we will understand what rotation is bringing into.

Before rotation:

| **Variance Explained by Each Factor** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Factor1** | **Factor2** | **Factor3** | **Factor4** | **Factor5** | **Factor6** |
| 2.6034794 | 1.5035315 | 0.9229405 | 0.7684460 | 0.1937046 | 0.0078981 |

After rotation:

| **Variance Explained by Each Factor** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Factor1** | **Factor2** | **Factor3** | **Factor4** | **Factor5** | **Factor6** |
| 1.7202596 | 1.7196898 | 1.2665347 | 1.0293484 | 0.2540707 | 0.0100968 |

Due to the rotation, first factor explanation power is reducing; however other all factors explanation power is increasing. Prior to rotation only 2 factors have values > 1. But after rotation, 4 factors are having values > 1. However we have considered 3 factors, as 4th factor is not growing more than 1 significantly even after the rotation.

**In step 2**, we are performing various statistical analyses to confirm that selected number of factors is good enough, which providing explanation for all the original variables. Here we have considered scenario, 3 factors are explaining all the 6 original variables.

method = ml Heywood

Method = ml (maximum likelihood) creates the following significance tests, First significance test is saying Null hypothesis as No common factors. We can reject null hypothesis if p-value is < 0.05, however in this case it is rejecting null hypothesis very strongly (p-value < 0.0001). Hence we can say that we have very strong common factors existing in this database.

| **Significance Tests Based on 5199 Observations** | | | |
| --- | --- | --- | --- |
| **Test** | **DF** | **Chi-Square** | **Pr >  ChiSq** |
| **H0: No common factors** | 15 | 28373.2387 | <.0001 |
| **HA: At least one common factor** |  |  |  |
| **H0: 3 Factors are sufficient** | 0 | 51.3822 | <.0001 |
| **HA: More factors are needed** |  |  |  |

Second significance test is for testing the hypothesis that a given number of factors are sufficient to account for your data; in this instance your goal is a small chi-square value relative to its degrees of freedom. This outcome results in a *large* p-value (p > .05). One downside of this test is that the Chi-square test is very sensitive to sample size: given large degrees of freedom**, this test will normally reject the null hypothesis of the residual matrix being a null matrix**, even when the factor analysis solution is very good. Therefore, be careful in interpreting this test's significance value. Some data sets do not lend themselves to good factor solutions, regardless of the number of factors extracted.

Heywood option we specified because sometimes communalities are greater than 1, which is showing error. Here Heywood option can put cap on the values greater than 1 to 1.

Res

Res option creates the residual correlations matrix for all original variables. If all non-diagonal values are < 0.1, then we can consider that chosen 3 factors are explaining the variation for all 6 original variables. If the residual correlations or partial correlations are relatively large (> 0.1), then either the factors are not doing a good job explaining the data or we may need to extract more factors to more closely explain the correlations

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| | **Residual Correlations With Uniqueness on the Diagonal** | | | | | | | | | --- | --- | --- | --- | --- | --- | --- | --- | |  |  | **AgeAtStart** | **Height** | **Weight** | **Diastolic** | **Systolic** | **MRW** | | **AgeAtStart** | Age at Start | 0.84068 | 0.00000 | 0.00000 | -0.03027 | 0.00000 | -0.00213 | | **Height** |  | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | | **Weight** |  | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | | **Diastolic** |  | -0.03027 | 0.00000 | 0.00000 | 0.35022 | 0.00000 | -0.00713 | | **Systolic** |  | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | | **MRW** | Metropolitan Relative Weight | -0.00213 | 0.00000 | 0.00000 | -0.00713 | 0.00000 | 0.02283 | |
| | **Root Mean Square Off-Diagonal Residuals: Overall = 0.00804846** | | | | | | | --- | --- | --- | --- | --- | --- | | **AgeAtStart** | **Height** | **Weight** | **Diastolic** | **Systolic** | **MRW** | | 0.01357062 | 0.00000000 | 0.00000000 | 0.01390773 | 0.00000000 | 0.00332861 | |

Now we can statistically say that, chosen 3 factors are explaining variation very well for the original 6 variables and we can proceed with remaining other analysis E.g.: Cluster analysis on extracted factors etc.

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| |  | | --- | | Step1 Complete SAS Output |  |  | | --- | |  |  |  | | --- | |  |  |  | | --- | |  |  |  | | --- | |  |  |  | | --- | |  |  |  | | --- | | **The FACTOR Procedure** |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | | **Input Data Type** | Raw Data | | --- | --- | | **Number of Records Read** | 5209 | | **Number of Records Used** | 5199 | | **N for Significance Tests** | 5199 | |  |  | | --- | |  | |  |  |  | | --- | |  |  |  | | --- | |  |  |  | | --- | | **The FACTOR Procedure Initial Factor Method: Principal Components** |  |  | | --- | |  |  |  | | --- | | **Prior Communality Estimates: ONE** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | | **Eigenvalues of the Correlation Matrix: Total = 6 Average = 1** | | | | | | --- | --- | --- | --- | --- | |  | **Eigenvalue** | **Difference** | **Proportion** | **Cumulative** | | **1** | 2.60347936 | 1.09994784 | 0.4339 | 0.4339 | | **2** | 1.50353152 | 0.58059105 | 0.2506 | 0.6845 | | **3** | 0.92294047 | 0.15449450 | 0.1538 | 0.8383 | | **4** | 0.76844597 | 0.57474136 | 0.1281 | 0.9664 | | **5** | 0.19370461 | 0.18580654 | 0.0323 | 0.9987 | | **6** | 0.00789807 |  | 0.0013 | 1.0000 | |  |  | | --- | |  | | **6 factors will be retained by the NFACTOR criterion.** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- 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| --- | | **Factor1** | **Factor2** | **Factor3** | **Factor4** | **Factor5** | **Factor6** | | 2.6034794 | 1.5035315 | 0.9229405 | 0.7684460 | 0.1937046 | 0.0078981 | | | | **Final Communality Estimates: Total = 6.000000** | | | | | | | --- | --- | --- | --- | --- | --- | | **AgeAtStart** | **Height** | **Weight** | **Diastolic** | **Systolic** | **MRW** | | 1.0000000 | 1.0000000 | 1.0000000 | 1.0000000 | 1.0000000 | 1.0000000 | |  |  | | --- | |  |  |  | | --- | |  | |  |  |  | | --- | |  |  |  | | --- | |  |  |  | | --- | | **The FACTOR Procedure Rotation Method: Varimax** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | | **Orthogonal Transformation Matrix** | | | | | | | | --- | --- | --- | --- | --- | --- | --- | |  | **1** | **2** | **3** | **4** | **5** | **6** | | **1** | 0.68379 | 0.64316 | 0.10132 | 0.30271 | 0.12961 | 0.00883 | | **2** | -0.33028 | 0.41893 | 0.75980 | -0.35650 | -0.09987 | 0.03238 | | **3** | 0.45829 | -0.64058 | 0.60306 | 0.08383 | 0.09241 | 0.01937 | | **4** | -0.42495 | 0.01066 | 0.21678 | 0.87817 | -0.03217 | 0.01033 | | **5** | 0.18095 | -0.01839 | -0.01446 | 0.05534 | -0.98164 | 0.00446 | | **6** | 0.00064 | 0.00687 | 0.03938 | 0.00207 | -0.00501 | -0.99919 | | | | **Rotated Factor Pattern** | | | | | | | | | --- | --- | --- | --- | --- | --- | --- | --- | |  |  | **Factor1** | **Factor2** | **Factor3** | **Factor4** | **Factor5** | **Factor6** | | **Diastolic** |  | 0.96581 | 0.19898 | 0.01002 | 0.10471 | -0.12864 | 0.00187 | | **Systolic** |  | 0.83325 | 0.16100 | -0.03494 | 0.21037 | 0.48404 | -0.00038 | | **MRW** | Metropolitan Relative Weight | 0.19836 | 0.96022 | -0.16328 | 0.08840 | 0.03824 | -0.05187 | | **Weight** |  | 0.15671 | 0.85136 | 0.49185 | 0.03379 | 0.01314 | 0.08603 | | **Height** |  | -0.02791 | 0.04009 | 0.99634 | -0.06926 | -0.01073 | 0.00066 | | **AgeAtStart** | Age at Start | 0.16876 | 0.07570 | -0.06275 | 0.97999 | 0.03844 | -0.00030 | | | | **Variance Explained by Each Factor** | | | | | | | --- | --- | --- | --- | --- | --- | | **Factor1** | **Factor2** | **Factor3** | **Factor4** | **Factor5** | **Factor6** | | 1.7202596 | 1.7196898 | 1.2665347 | 1.0293484 | 0.2540707 | 0.0100968 | | | | **Final Communality Estimates: Total = 6.000000** | | | | | | | --- | --- | --- | --- | --- | --- | | **AgeAtStart** | **Height** | **Weight** | **Diastolic** | **Systolic** | **MRW** | | 1.0000000 | 1.0000000 | 1.0000000 | 1.0000000 | 1.0000000 | 1.0000000 | |  |  | | --- | |  | |  |  |  | | --- | |  |  |  | | --- | |  |  |  | | --- | | **The FACTOR Procedure Rotation Method: Varimax** |  |  | | --- | |  |  |  | | --- | | **Scoring Coefficients Estimated by Regression** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | | **Squared Multiple Correlations of the Variables with Each Factor** | | | | | | | --- | --- | --- | --- | --- | --- | | **Factor1** | **Factor2** | **Factor3** | **Factor4** | **Factor5** | **Factor6** | | 1.0000000 | 1.0000000 | 1.0000000 | 1.0000000 | 1.0000000 | 1.0000000 | | | | **Standardized Scoring Coefficients** | | | | | | | | | --- | --- | --- | --- | --- | --- | --- | --- | |  |  | **Factor1** | **Factor2** | **Factor3** | **Factor4** | **Factor5** | **Factor6** | | **Diastolic** |  | 0.87933874 | -0.1242797 | 0.00838622 | -0.0850494 | -1.4349565 | -0.1672319 | | **Systolic** |  | 0.25753486 | -0.098979 | 0.0223172 | -0.1019775 | 1.70159094 | 0.16292465 | | **MRW** | Metropolitan Relative Weight | -0.1298407 | 0.70998973 | -0.0303698 | -0.0362609 | -0.0042393 | -6.6008561 | | **Weight** |  | -0.0968231 | 0.43096406 | -0.0260097 | -0.0173256 | 0.03498988 | 7.68527071 | | **Height** |  | 0.01833966 | -0.1018635 | 1.01662706 | 0.06665012 | 0.04292138 | -4.8701503 | | **AgeAtStart** | Age at Start | -0.1328945 | -0.0515773 | 0.0698011 | 1.05997979 | -0.2097432 | -0.0308419 | |  |  |  |  | | --- | --- | --- | |  | | | |  | | | |  | |  | |  | |

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| |  | | --- | | Step2 Complete SAS Output |   **The FACTOR Procedure** |

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| | **Input Data Type** | Raw Data | | --- | --- | | **Number of Records Read** | 5209 | | **Number of Records Used** | 5199 | | **N for Significance Tests** | 5199 | |

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| **The FACTOR Procedure Initial Factor Method: Maximum Likelihood** |

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| | **Prior Communality Estimates: SMC** | | | | | | | --- | --- | --- | --- | --- | --- | | **AgeAtStart** | **Height** | **Weight** | **Diastolic** | **Systolic** | **MRW** | | 0.16226435 | 0.95962678 | 0.98312541 | 0.65314539 | 0.66766088 | 0.97732144 | |
| | **Preliminary Eigenvalues: Total = 129.209804  Average = 21.5349674** | | | | | | --- | --- | --- | --- | --- | |  | **Eigenvalue** | **Difference** | **Proportion** | **Cumulative** | | **1** | 93.6719320 | 60.5968717 | 0.7250 | 0.7250 | | **2** | 33.0750603 | 29.5461649 | 0.2560 | 0.9809 | | **3** | 3.5288955 | 3.4927333 | 0.0273 | 1.0083 | | **4** | 0.0361621 | 0.4713222 | 0.0003 | 1.0085 | | **5** | -0.4351601 | 0.2319252 | -0.0034 | 1.0052 | | **6** | -0.6670853 |  | -0.0052 | 1.0000 | |

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| **3 factors will be retained by the NFACTOR criterion.** |

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| Warning: Too many factors for a unique solution. |

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| | **Iteration** | **Criterion** | **Ridge** | **Change** | **Communalities** | | | | | | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **1** | 0.4999617 | 0.0000 | 0.0414 | 0.16067 | 0.95900 | 1.00000 | 0.64427 | 0.70911 | 0.95990 | | **2** | 0.0472913 | 0.0000 | 0.2909 | 0.14873 | 0.98567 | 1.00000 | 0.58545 | 1.00000 | 0.97914 | | **3** | 0.0330899 | 0.0000 | 0.0154 | 0.15111 | 1.00000 | 1.00000 | 0.60084 | 1.00000 | 0.97272 | | **4** | 0.0098942 | 0.0000 | 0.0489 | 0.15932 | 1.00000 | 1.00000 | 0.64978 | 1.00000 | 0.97717 | |
| | Convergence criterion satisfied. | | --- | |
| | **Significance Tests Based on 5199 Observations** | | | | | --- | --- | --- | --- | | **Test** | **DF** | **Chi-Square** | **Pr >  ChiSq** | | **H0: No common factors** | 15 | 28373.2387 | <.0001 | | **HA: At least one common factor** |  |  |  | | **H0: 3 Factors are sufficient** | 0 | 51.3822 | <.0001 | | **HA: More factors are needed** |  |  |  | |
| | **Chi-Square without Bartlett's Correction** | 51.430051 | | --- | --- | | **Akaike's Information Criterion** | 51.430051 | | **Schwarz's Bayesian Criterion** | 51.430051 | | **Tucker and Lewis's Reliability Coefficient** | 0.000000 | |
| | **Squared Canonical Correlations** | | | | --- | --- | --- | | **Factor1** | **Factor2** | **Factor3** | | 1.0000000 | 1.0000000 | 1.0000000 | |
| | **Eigenvalues of the Weighted Reduced Correlation Matrix: Total = 0 Average = 0** | | | | --- | --- | --- | |  | **Eigenvalue** | **Difference** | | **1** | Infty | Infty | | **2** | Infty | Infty | | **3** | Infty | Infty | | **4** | 0.09053694 | 0.07613252 | | **5** | 0.01440442 | 0.11934577 | | **6** | -.10494135 |  | |
| | **Factor Pattern** | | | | | | --- | --- | --- | --- | --- | |  |  | **Factor1** | **Factor2** | **Factor3** | | **Systolic** |  | 0.95658 | 0.29068 | -0.02141 | | **Diastolic** |  | 0.72816 | 0.34481 | 0.02601 | | **AgeAtStart** | Age at Start | 0.34265 | 0.17056 | -0.11322 | | **MRW** | Metropolitan Relative Weight | 0.07917 | 0.97910 | -0.11071 | | **Weight** |  | 0.03208 | 0.84198 | 0.53856 | | **Height** |  | -0.04540 | -0.02260 | 0.99871 | |
| | **Variance Explained by Each Factor** | | | | --- | --- | --- | | **Factor** | **Weighted** | **Unweighted** | | **Factor1** | 1.9281093 | 1.57202042 | | **Factor2** | 42.3593941 | 1.90055405 | | **Factor3** | 0.5540163 | 1.31368753 | |
| | **Final Communality Estimates and Variable Weights** | | | | --- | --- | --- | | **Total Communality: Weighted = 44.841520 Unweighted = 4.786262** | | | | **Variable** | **Communality** | **Weight** | | **AgeAtStart** | 0.15931539 | 1.1895067 | | **Height** | 1.00000000 | Infty | | **Weight** | 1.00000000 | Infty | | **Diastolic** | 0.64977938 | 2.8553430 | | **Systolic** | 1.00000000 | Infty | | **MRW** | 0.97716721 | 43.7966700 | |
| | **Residual Correlations With Uniqueness on the Diagonal** | | | | | | | | | --- | --- | --- | --- | --- | --- | --- | --- | |  |  | **AgeAtStart** | **Height** | **Weight** | **Diastolic** | **Systolic** | **MRW** | | **AgeAtStart** | Age at Start | 0.84068 | 0.00000 | 0.00000 | -0.03027 | 0.00000 | -0.00213 | | **Height** |  | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | | **Weight** |  | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | | **Diastolic** |  | -0.03027 | 0.00000 | 0.00000 | 0.35022 | 0.00000 | -0.00713 | | **Systolic** |  | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | | **MRW** | Metropolitan Relative Weight | -0.00213 | 0.00000 | 0.00000 | -0.00713 | 0.00000 | 0.02283 | |
| | **Root Mean Square Off-Diagonal Residuals: Overall = 0.00804846** | | | | | | | --- | --- | --- | --- | --- | --- | | **AgeAtStart** | **Height** | **Weight** | **Diastolic** | **Systolic** | **MRW** | | 0.01357062 | 0.00000000 | 0.00000000 | 0.01390773 | 0.00000000 | 0.00332861 | |
| | **Partial Correlations Controlling Factors** | | | | | | | | | --- | --- | --- | --- | --- | --- | --- | --- | |  |  | **AgeAtStart** | **Height** | **Weight** | **Diastolic** | **Systolic** | **MRW** | | **AgeAtStart** | Age at Start | 1.00000 | 0.00000 | 0.00000 | -0.05579 | 0.00000 | -0.01538 | | **Height** |  | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | | **Weight** |  | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | | **Diastolic** |  | -0.05579 | 0.00000 | 0.00000 | 1.00000 | 0.00000 | -0.07975 | | **Systolic** |  | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | | **MRW** | Metropolitan Relative Weight | -0.01538 | 0.00000 | 0.00000 | -0.07975 | 0.00000 | 1.00000 | |
| | **Root Mean Square Off-Diagonal Partials: Overall = 0.02544085** | | | | | | | --- | --- | --- | --- | --- | --- | | **AgeAtStart** | **Height** | **Weight** | **Diastolic** | **Systolic** | **MRW** | | 0.02587909 | 0.00000000 | 0.00000000 | 0.04352465 | 0.00000000 | 0.03632217 | |

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| **The FACTOR Procedure Rotation Method: Varimax** |

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| | **Orthogonal Transformation Matrix** | | | | | --- | --- | --- | --- | |  | **1** | **2** | **3** | | **1** | 0.98088 | -0.18659 | 0.05526 | | **2** | 0.18968 | 0.98017 | -0.05733 | | **3** | -0.04346 | 0.06672 | 0.99682 | |
| | **Rotated Factor Pattern** | | | | | | --- | --- | --- | --- | --- | |  |  | **Factor1** | **Factor2** | **Factor3** | | **Systolic** |  | 0.99436 | 0.10500 | 0.01485 | | **Diastolic** |  | 0.77851 | 0.20384 | 0.04639 | | **AgeAtStart** | Age at Start | 0.37337 | 0.09569 | -0.10371 | | **MRW** | Metropolitan Relative Weight | 0.26819 | 0.93753 | -0.16212 | | **Weight** |  | 0.16776 | 0.85523 | 0.49035 | | **Height** |  | -0.09222 | 0.05295 | 0.99433 | |
| | **Variance Explained by Each Factor** | | | | --- | --- | --- | | **Factor** | **Weighted** | **Unweighted** | | **Factor1** | 5.0463890 | 1.84280500 | | **Factor2** | 38.6250781 | 1.67491042 | | **Factor3** | 1.1700525 | 1.26854657 | |
| | **Final Communality Estimates and Variable Weights** | | | | --- | --- | --- | | **Total Communality: Weighted = 44.841520 Unweighted = 4.786262** | | | | **Variable** | **Communality** | **Weight** | | **AgeAtStart** | 0.15931539 | 1.1895067 | | **Height** | 1.00000000 | Infty | | **Weight** | 1.00000000 | Infty | | **Diastolic** | 0.64977938 | 2.8553430 | | **Systolic** | 1.00000000 | Infty | | **MRW** | 0.97716721 | 43.7966700 | |

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| **The FACTOR Procedure Rotation Method: Varimax** |

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| **Scoring Coefficients Estimated by Regression** |

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| | **Squared Multiple Correlations of the Variables with Each Factor** | | | | --- | --- | --- | | **Factor1** | **Factor2** | **Factor3** | | 1.0000000 | 1.0000000 | 1.0000000 | |
| | **Standardized Scoring Coefficients** | | | | | | --- | --- | --- | --- | --- | |  |  | **Factor1** | **Factor2** | **Factor3** | | **Systolic** |  | 1.03206045 | -0.2654386 | 0.10985696 | | **Diastolic** |  | -3.608E-16 | -1.11E-16 | -1.665E-16 | | **AgeAtStart** | Age at Start | 3.8858E-16 | -5.551E-17 | 5.5511E-17 | | **MRW** | Metropolitan Relative Weight | 1.7764E-15 | -7.105E-15 | -4.441E-15 | | **Weight** |  | -0.1297212 | 1.23947181 | -0.0780387 | | **Height** |  | 0.04855984 | -0.607278 | 1.04254687 | |

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