```
 SORT CASES  BY HasValidConcl.
SPLIT FILE SEPARATE BY HasValidConcl.
DATASET ACTIVATE DataSet1.
CLUSTER   Acc204
  /METHOD WARD
  /MEASURE=SEUCLID
  /ID=syllogism
  /PRINT SCHEDULE
  /PLOT DENDROGRAM VICICLE.
```

# Cluster

## HasValidConcl = N

### Case Processing Summary[a,b,c]

| Cases | | | | | |
|---|---|---|---|---|---|
| Valid | | Missing | | Total | |
| N | Percent | N | Percent | N | Percent |
| 37 | 100.0 | 0 | .0 | 37 | 100.0 |

a. HasValidConcl = N

b.  Squared Euclidean Distance used
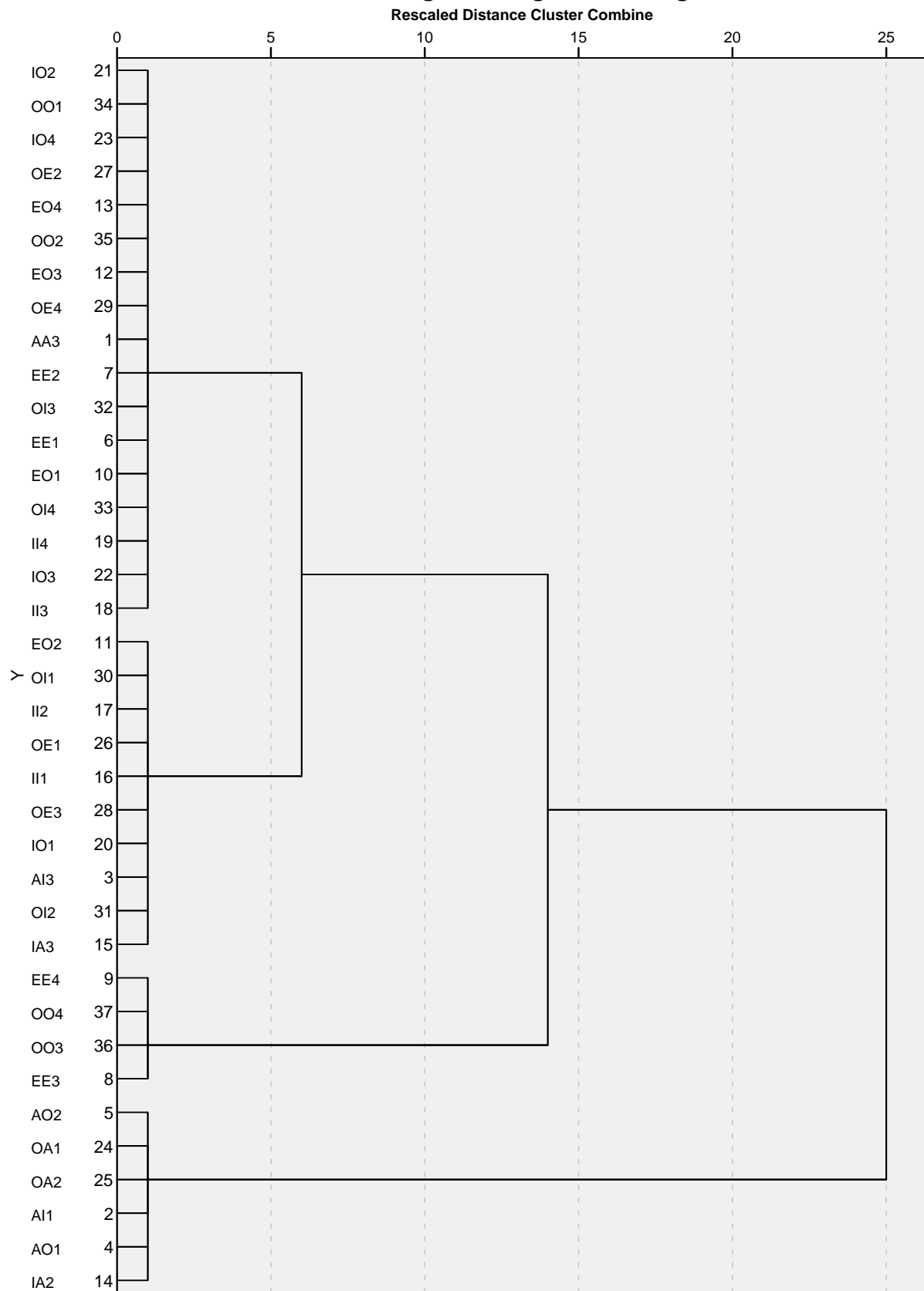
c. Ward Linkage

## Ward Linkage

**Agglomeration Schedule[a]**

| | Cluster Combined | | | Stage Cluster First Appears | | |
|---|---|---|---|---|---|---|
| Stage | Cluster 1 | Cluster 2 | Coefficients | Cluster 1 | Cluster 2 | Next Stage |
| 1 | 21 | 34 | .000 | 0 | 0 | 24 |
| 2 | 10 | 33 | .000 | 0 | 0 | 21 |
| 3 | 7 | 32 | .000 | 0 | 0 | 11 |
| 4 | 3 | 31 | .000 | 0 | 0 | 26 |
| 5 | 12 | 29 | .000 | 0 | 0 | 10 |
| 6 | 16 | 28 | .000 | 0 | 0 | 15 |
| 7 | 23 | 27 | .000 | 0 | 0 | 14 |
| 8 | 17 | 26 | .000 | 0 | 0 | 20 |
| 9 | 5 | 24 | .000 | 0 | 0 | 22 |
| 10 | 1 | 12 | .000 | 0 | 5 | 17 |
| 11 | 6 | 7 | .000 | 0 | 3 | 17 |
| 12 | 19 | 22 | .000 | 0 | 0 | 21 |
| 13 | 11 | 30 | .000 | 0 | 0 | 23 |
| 14 | 13 | 23 | .000 | 0 | 7 | 16 |
| 15 | 16 | 20 | .000 | 6 | 0 | 20 |
| 16 | 13 | 35 | .000 | 14 | 0 | 24 |
| 17 | 1 | 6 | .000 | 10 | 11 | 29 |
| 18 | 9 | 37 | .000 | 0 | 0 | 27 |
| 19 | 2 | 4 | .000 | 0 | 0 | 28 |
| 20 | 16 | 17 | .000 | 15 | 8 | 23 |
| 21 | 10 | 19 | .000 | 2 | 12 | 25 |
| 22 | 5 | 25 | .001 | 9 | 0 | 31 |
| 23 | 11 | 16 | .001 | 13 | 20 | 32 |
| 24 | 13 | 21 | .002 | 16 | 1 | 29 |
| 25 | 10 | 18 | .002 | 21 | 0 | 33 |
| 26 | 3 | 15 | .003 | 4 | 0 | 32 |
| 27 | 9 | 36 | .003 | 18 | 0 | 30 |
| 28 | 2 | 14 | .004 | 19 | 0 | 31 |
| 29 | 1 | 13 | .006 | 17 | 24 | 33 |
| 30 | 8 | 9 | .007 | 0 | 27 | 35 |
| 31 | 2 | 5 | .011 | 28 | 22 | 36 |
| 32 | 3 | 11 | .015 | 26 | 23 | 34 |
| 33 | 1 | 10 | .021 | 29 | 25 | 34 |
| 34 | 1 | 3 | .067 | 33 | 32 | 35 |
| 35 | 1 | 8 | .172 | 34 | 30 | 36 |
| 36 | 1 | 2 | .364 | 35 | 31 | 0 |

a. HasValidConcl = N

**Case**

**Number of clusters**

# Dendrogram using Ward Linkage
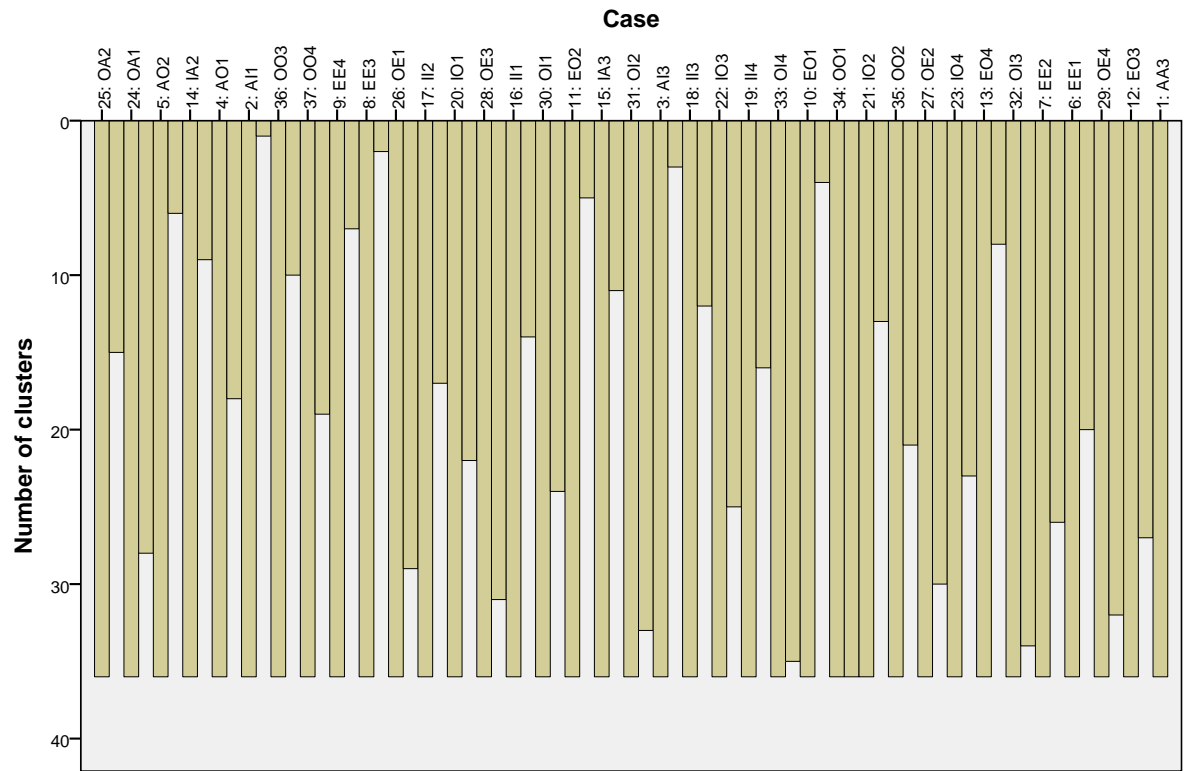
**Rescaled Distance Cluster Combine**



**HasValidConcl = Y**

## Case Processing Summary[a,b,c]

| Cases | | | | | |
|---|---|---|---|---|---|
| Valid | | Missing | | Total | |
| N | Percent | N | Percent | N | Percent |
| 27 | 100.0 | 0 | .0 | 27 | 100.0 |

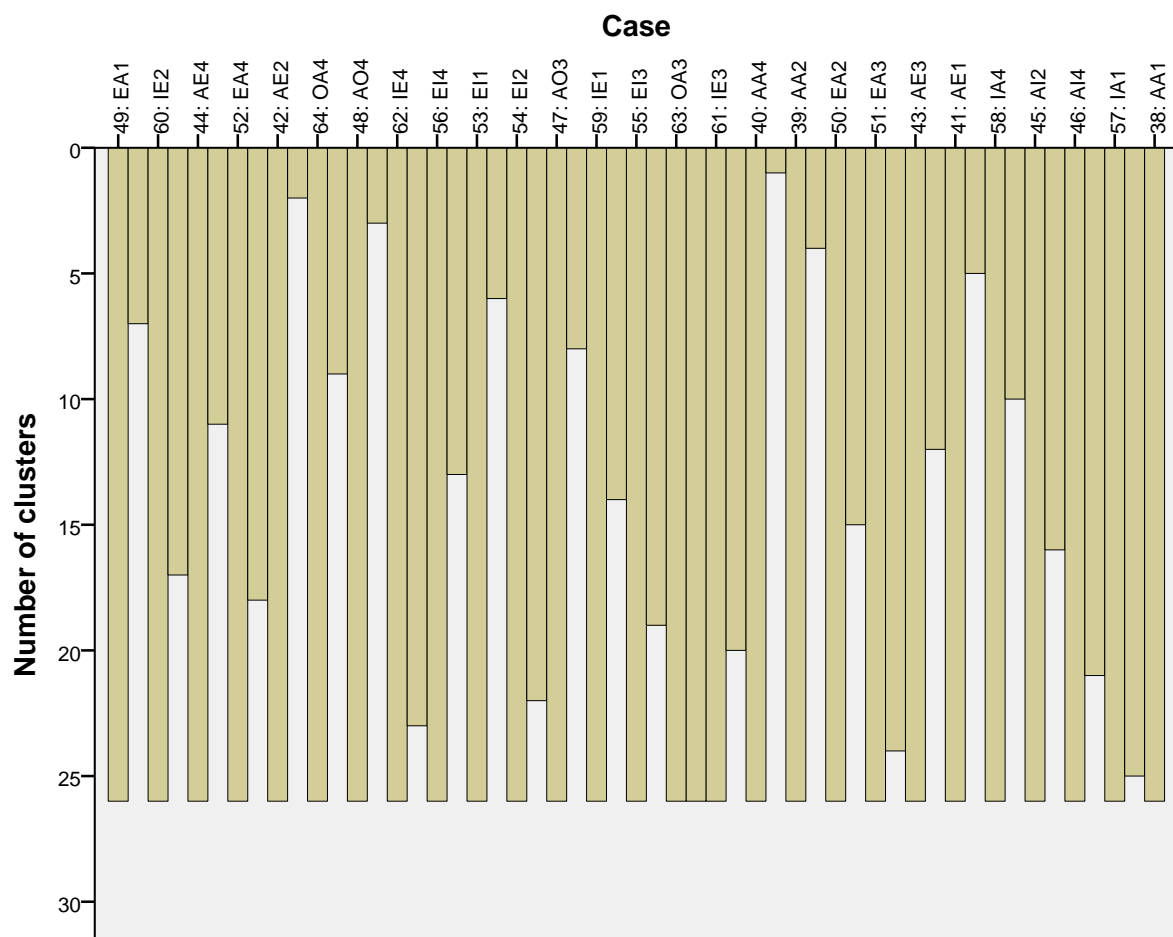a. HasValidConcl = Y

b.  Squared Euclidean Distance used

c. Ward Linkage

# Ward Linkage

## Agglomeration Schedule[a]

| Stage | Cluster Combined | | Coefficients | Stage Cluster First Appears | | Next Stage |
|---|---|---|---|---|---|---|
| | Cluster 1 | Cluster 2 | | Cluster 1 | Cluster 2 | |
| 1 | 61 | 63 | .000 | 0 | 0 | 7 |
| 2 | 38 | 57 | .000 | 0 | 0 | 6 |
| 3 | 43 | 51 | .000 | 0 | 0 | 12 |
| 4 | 56 | 62 | .000 | 0 | 0 | 14 |
| 5 | 47 | 54 | .000 | 0 | 0 | 19 |
| 6 | 38 | 46 | .000 | 2 | 0 | 11 |
| 7 | 40 | 61 | .000 | 0 | 1 | 8 |
| 8 | 40 | 55 | .000 | 7 | 0 | 13 |
| 9 | 42 | 52 | .000 | 0 | 0 | 16 |
| 10 | 44 | 60 | .000 | 0 | 0 | 16 |
| 11 | 38 | 45 | .001 | 6 | 0 | 17 |
| 12 | 43 | 50 | .001 | 3 | 0 | 15 |
| 13 | 40 | 59 | .001 | 8 | 0 | 19 |
| 14 | 53 | 56 | .001 | 0 | 4 | 21 |
| 15 | 41 | 43 | .002 | 0 | 12 | 22 |
| 16 | 42 | 44 | .003 | 9 | 10 | 20 |
| 17 | 38 | 58 | .004 | 11 | 0 | 22 |
| 18 | 48 | 64 | .007 | 0 | 0 | 24 |
| 19 | 40 | 47 | .009 | 13 | 5 | 21 |
| 20 | 42 | 49 | .014 | 16 | 0 | 25 |
| 21 | 40 | 53 | .020 | 19 | 14 | 24 |
| 22 | 38 | 41 | .030 | 17 | 15 | 23 |
| 23 | 38 | 39 | .049 | 22 | 0 | 26 |
| 24 | 40 | 48 | .101 | 21 | 18 | 25 |
| 25 | 40 | 42 | .205 | 24 | 20 | 26 |
| 26 | 38 | 40 | 1.768 | 23 | 25 | 0 |

a. HasValidConcl = Y

**Case**

**Number of clusters**

## Dendrogram using Ward Linkage

**Rescaled Distance Cluster Combine**

| | | 0 | 5 | 10 | 15 | 20 | 25 |
|---|---|---|---|---|---|---|---|
| IE3 | 61 | | | | | | |
| OA3 | 63 | | | | | | |
| AA4 | 40 | | | | | | |
| EI3 | 55 | | | | | | |
| IE1 | 59 | | | | | | |
| AO3 | 47 | | | | | | |
| EI2 | 54 | | | | | | |
| EI4 | 56 | | | | | | |
| IE4 | 62 | | | | | | |
| EI1 | 53 | | | | | | |
| AO4 | 48 | | | | | | |
| OA4 | 64 | | | | | | |
| AE2 | 42 | | | | | | |
| EA4 | 52 | | | | | | |
| AE4 | 44 | | | | | | |
| IE2 | 60 | | | | | | |
| EA1 | 49 | | | | | | |
| AE3 | 43 | | | | | | |
| EA3 | 51 | | | | | | |
| EA2 | 50 | | | | | | |
| AE1 | 41 | | | | | | |
| AA1 | 38 | | | | | | |
| IA1 | 57 | | | | | | |
| AI4 | 46 | | | | | | |
| AI2 | 45 | | | | | | |
| IA4 | 58 | | | | | | |
| AA2 | 39 | | | | | | |
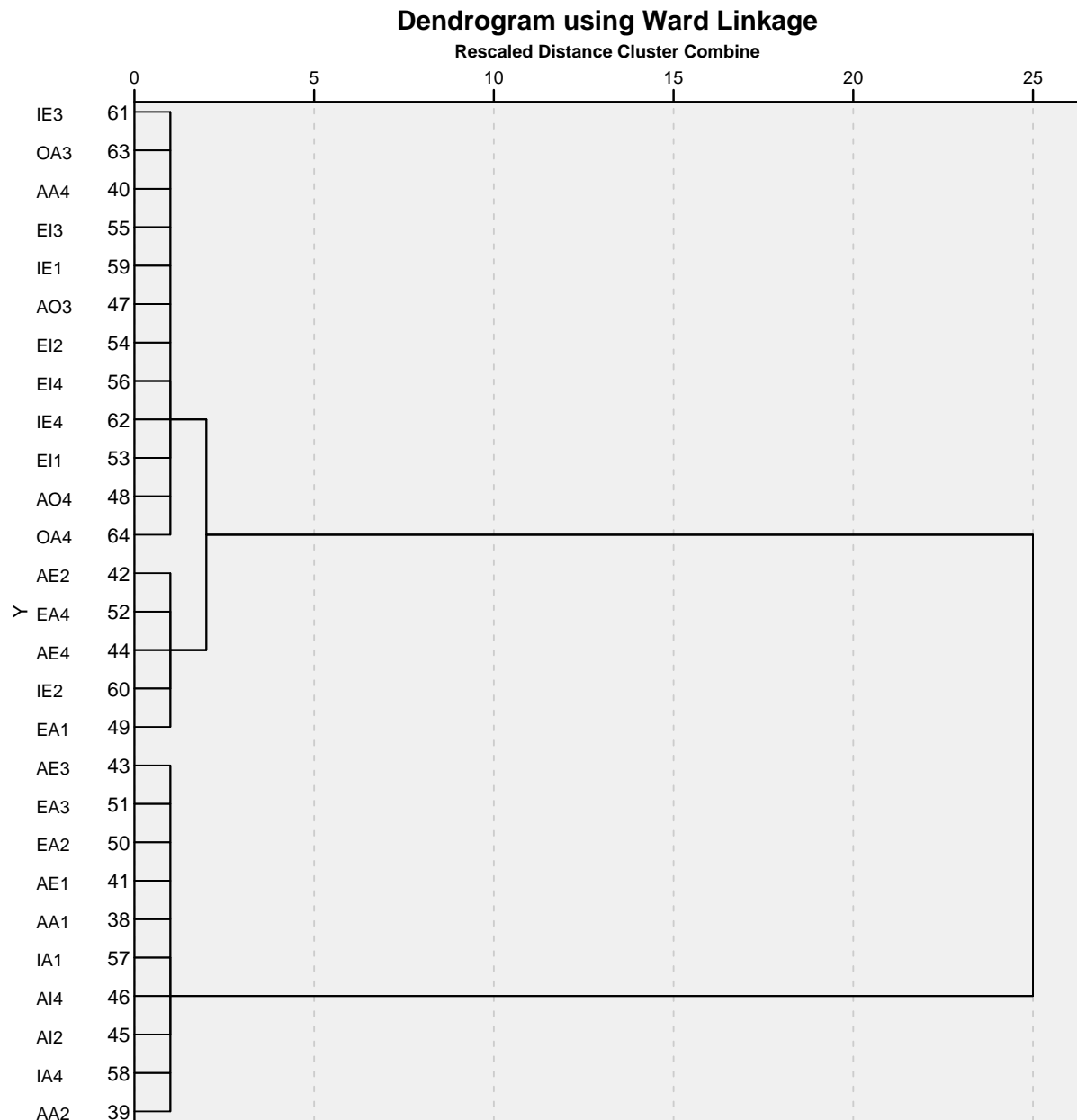
```
QUICK CLUSTER Acc204
 /MISSING=LISTWISE
 /CRITERIA=CLUSTER(3) MXITER(10) CONVERGE(0)
 /METHOD=KMEANS(NOUPDATE)
 /SAVE CLUSTER
 /PRINT ID(syllogism) INITIAL ANOVA CLUSTER DISTAN.
```

## K-Means, 3 clusters

## HasValidConcl = N

**Initial Cluster Centers[a]**

| | Cluster | | |
|---|---|---|---|
| | 1 | 2 | 3 |
| Acc204 | .4804 | .0539 | .2647 |

a. HasValidConcl = N

**Iteration History[a,b]**

| | Change in Cluster Centers | | |
|---|---|---|---|
| Iteration | 1 | 2 | 3 |
| 1 | .037 | .043 | .006 |
| 2 | .000 | .010 | .004 |
| 3 | .000 | .000 | .000 |

a. HasValidConcl = N

b. Convergence achieved due to no or small change in cluster centers. The maximum absolute coordinate change for any center is .000. The current iteration is 3. The minimum distance between initial centers is ....

**Cluster Membership[a]**

| Case Number | syllogism | Cluster | Distance |
|---|---|---|---|
| 1 | AA3 | 3 | .025 |
| 2 | AI1 | 2 | .029 |
| 3 | AI3 | 3 | .078 |
| 4 | AO1 | 2 | .019 |
| 5 | AO2 | 2 | .020 |
| 6 | EE1 | 3 | .029 |
| 7 | EE2 | 3 | .029 |
| 8 | EE3 | 1 | .037 |
| 9 | EE4 | 1 | .002 |
| 10 | EO1 | 3 | .049 |
| 11 | EO2 | 3 | .029 |
| 12 | EO3 | 3 | .025 |
| 13 | EO4 | 3 | .005 |
| 14 | IA2 | 2 | .053 |
| 15 | IA3 | 2 | .060 |
| 16 | II1 | 3 | .049 |
| 17 | II2 | 3 | .054 |
| 18 | II3 | 3 | .078 |
| 19 | II4 | 3 | .054 |
| 20 | IO1 | 3 | .044 |

**Cluster Membership**[a]

| Case Number | syllogism | Cluster | Distance |
|---|---|---|---|
| 21 | IO2 | 3 | .010 |
| 22 | IO3 | 3 | .059 |
| 23 | IO4 | 3 | .010 |
| 24 | OA1 | 2 | .020 |
| 25 | OA2 | 2 | .001 |
| 26 | OE1 | 3 | .054 |
| 27 | OE2 | 3 | .010 |
| 28 | OE3 | 3 | .049 |
| 29 | OE4 | 3 | .025 |
| 30 | OI1 | 3 | .034 |
| 31 | OI2 | 3 | .078 |
| 32 | OI3 | 3 | .029 |
| 33 | OI4 | 3 | .049 |
| 34 | OO1 | 3 | .010 |
| 35 | OO2 | 3 | .015 |
| 36 | OO3 | 1 | .032 |
| 37 | OO4 | 1 | .007 |

a. HasValidConcl = N

**Final Cluster Centers**[a]

| | Cluster | | |
|---|---|---|---|
| | 1 | 2 | 3 |
| Acc204 | .4436 | .1071 | .2745 |

a. HasValidConcl = N

**Distances between Final Cluster Centers**[a]

| Cluster | 1 | 2 | 3 |
|---|---|---|---|
| 1 | | .336 | .169 |
| 2 | .336 | | .167 |
| 3 | .169 | .167 | |

a. HasValidConcl = N

**ANOVA[a]**

| | Cluster | | Error | | | |
|---|---|---|---|---|---|---|
| | Mean Square | df | Mean Square | df | F | Sig. |
| Acc204 | .152 | 2 | .002 | 34 | 85.994 | .000 |

The F tests should be used only for descriptive purposes because the clusters have been chosen to maximize the differences among cases in different clusters. The observed significance levels are not corrected for this and thus cannot be interpreted as tests of the hypothesis that the cluster means are equal.

a. HasValidConcl = N

**Number of Cases in each Cluster[a]**

| Cluster | 1 | 4.000 |
|---|---|---|
| | 2 | 7.000 |
| | 3 | 26.000 |
| Valid | | 37.000 |
| Missing | | .000 |

a. HasValidConcl = N

# HasValidConcl = Y

**Initial Cluster Centers[a]**

| | Cluster | | |
|---|---|---|---|
| | 1 | 2 | 3 |
| Acc204 | .7990 | .3922 | .0490 |

a. HasValidConcl = Y

**Iteration History[a,b]**

| | Change in Cluster Centers | | |
|---|---|---|---|
| Iteration | 1 | 2 | 3 |
| 1 | .072 | .090 | .097 |
| 2 | .000 | .000 | .000 |

a. HasValidConcl = Y

b. Convergence achieved due to no or small change in cluster centers. The maximum absolute coordinate change for any center is .000. The current iteration is 2. The minimum distance between initial centers is ....

**Cluster Membership<sup>a</sup>**

| Case Number | syllogism | Cluster | Distance |
|---|---|---|---|
| 38 | AA1 | 1 | .001 |
| 39 | AA2 | 1 | .129 |
| 40 | AA4 | 2 | .047 |
| 41 | AE1 | 1 | .072 |
| 42 | AE2 | 3 | .044 |
| 43 | AE3 | 1 | .052 |
| 44 | AE4 | 3 | .001 |
| 45 | AI2 | 1 | .021 |
| 46 | AI4 | 1 | .006 |
| 47 | AO3 | 2 | .008 |
| 48 | AO4 | 2 | .159 |
| 49 | EA1 | 3 | .097 |
| 50 | EA2 | 1 | .033 |
| 51 | EA3 | 1 | .052 |
| 52 | EA4 | 3 | .034 |
| 53 | EI1 | 3 | .050 |
| 54 | EI2 | 2 | .003 |
| 55 | EI3 | 2 | .057 |
| 56 | EI4 | 3 | .069 |
| 57 | IA1 | 1 | .001 |
| 58 | IA4 | 1 | .050 |
| 59 | IE1 | 2 | .032 |
| 60 | IE2 | 3 | .019 |
| 61 | IE3 | 2 | .052 |
| 62 | IE4 | 3 | .074 |
| 63 | OA3 | 2 | .052 |
| 64 | OA4 | 2 | .090 |

a. HasValidConcl = Y

**Final Cluster Centers<sup>a</sup>**

| | Cluster | | |
|---|---|---|---|
| | 1 | 2 | 3 |
| Acc204 | .7270 | .3017 | .1464 |

a. HasValidConcl = Y

**Distances between Final Cluster Centers**[a]

| Cluster | 1 | 2 | 3 |
|---|---|---|---|
| 1 | | .425 | .581 |
| 2 | .425 | | .155 |
| 3 | .581 | .155 | |

a. HasValidConcl = Y

**ANOVA**[a]

| | Cluster | | Error | | | |
|---|---|---|---|---|---|---|
| | Mean Square | df | Mean Square | df | F | Sig. |
| Acc204 | .833 | 2 | .004 | 24 | 195.191 | .000 |

The F tests should be used only for descriptive purposes because the clusters have been chosen to maximize the differences among cases in different clusters. The observed significance levels are not corrected for this and thus cannot be interpreted as tests of the hypothesis that the cluster means are equal.

a. HasValidConcl = Y

**Number of Cases in each Cluster**[a]

| Cluster | 1 | 10.000 |
|---|---|---|
| | 2 | 9.000 |
| | 3 | 8.000 |
| Valid | | 27.000 |
| Missing | | .000 |

a. HasValidConcl = Y