Who do heterodox economists think they are?

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Abstract:

This paper attempts to engage with the (now) established debate on the nature of heterodox economics. However, it starts from the position that previous attempts to classify and identify heterodox economics have been too biased towards a priori definition. The paper aims to inform the discussion of the nature of heterodoxy with some empirical analysis. The paper examines survey data collected from a small/medium-sized sample of AHE members on the core concepts in economics. The paper applies factor analysis to the data. It also applies principles of biological taxonomy, and thence cluster analysis to the data. The paper finds that within the self-identified community of self-identified heterodox economists there is little agreement as to whether members wish to call themselves heterodox, whether they are pluralist, or what their attitude is to the mainstream. Indeed, there is little agreement on any core concepts or principles. The paper argues that there is little structure to heterodox economics beyond that provided by pre-existing (or constituent) schools of thought.

Keywords: heterodox economics, survey, factor analysis, cluster analysis

JEL classifications: B5, C19, C83

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Introduction

What is heterodox economics? The term is now established in the literature, arguably more firmly than at any other time. It was used originally in the 1930s and 1940s (Ayres, 1936; Commons, 1932, 1936; Gruchy, 1947, 1948) but has gained popularity mainly in the 1990s and beyond (see Lee, 2009 for a full historical treatment). The term is even being used by mainstream economists (heterodox approaches have their own JEL classification, B5). Projects are being funded to investigate how heterodox economics might enhance economics teaching and to develop resources to do this (for example, in the UK via the *Economics Network*). The *Association for Heterodox Economists* has now held 11 successful annual conferences plus numerous other events, including postgraduate training workshops and seminars. All of this suggests that the heterodox economics community is vibrant; and thus by extension, heterodox economics is strong. But what does it mean to be strong? Strength may imply coherence; but strength may also be provided by diversity. Thus we might imagine heterodox economics as a strong core surrounded by diverse strands of thought. But what is that core? Is there an essence of heterodox economics? More importantly, what is it?

This paper attempts to address that question empirically. In the next section of the paper it will be briefly argued that there is no agreed concept of heterodox economics, only competing definitions based usually on totalising dualistic distinctions between orthodox

(or mainstream) and heterodox. It will be claimed that all existing treatments of heterodox are based on *a priori* definitions. The remainder of the paper will try to move away from this *a priori* approach and begin an investigation based on an empirical data. This treatment takes seriously the notion that heterodox economists know who they are and what heterodox economics is by asking them about their core beliefs in economics. A range of statistical techniques, including factor and cluster analysis, is then applied to the data. The results are suggestive of a) the nature of heterodox economics and b) future research necessary to explore this question. On (a), the results suggest that heterodox economics is difficult to define, and that the heterodox community is diverse complex of individuals, groups and ideas.

Heterodox economics

This section offers a very brief meta-analysis of definitions of heterodox economics. The literal meaning of heterodox is as 'not orthodox'. Dequech (2007-8) offers a helpful analysis of existing definitions of heterodox and finds that it is difficult to arrive at one which adequately describes the current heterodox community other than 'not orthodox'. This is rather unsatisfactory because it appears to undersell heterodox economics, which in its traditional composite elements, such as Marxism and Keynesianism, would appear to be more than merely critique. Both Marxism and Keynesianism, for example, contain constructive programmes of economic theory (albeit in an interdisciplinary way), economic method, logic, ontology, politics, ethics, etc. which differ from those espoused by the mainstream economics. However, even if the components of heterodox economics

have such characteristics, it does not follow that heterodox economics does. Nonetheless, perhaps aware of the agenda of not appearing merely critical, several economists have offered explicit or implicit definitions of heterodox economics.

Thus we have a range of definitions. Lee (2009) defines heterodox economics, rightly, as a concatenation of ideas, but identifies it as being based on the notion of an analysis of the provisioning process as being necessarily social, whereas mainstream economics views the provisioning process in asocial (individualistic) terms. Davis (2009) suggests support for Lee's definition by identifying the essence of mainstream economics as individualism, plus beliefs in the centrality of equilibrium and rationality. Note that both of these base their definitions on meta-theoretical concepts. Lawson (2006) goes to a different level to define mainstream economics in terms of the insistence on the use of mathematical modelling in economics. All three define heterodox economics as being not mainstream. The composition of the *Association for Heterodox Economists* defines heterodoxy in terms of specific pre-existing schools of non-mainstream thought. Yet, the contents of George (2008) suggest heterodoxy being something very different.

How well do these definitions describe the current heterodox communities? It could be argued that Lawson's definition does best, because it is true that none of the current heterodox communities insist on the use of mathematics. It is also strongly arguable that the mainstream does insist on mathematical modelling; it is also true that such a movement is a powerful force in economics. Thus, Lawson's definition has some utility. However, in other ways it is rather unsatisfactory, for instance because it is rather narrow.

The definition itself – although Lawson would acknowledge the wider nature of heterodoxy – also does not capture the notion identified by Lee as heterodox economics as a concatenation of ideas; in other words, a complex system. However, if we try to apply either Lee's (2009) or Davis' (2009) definitions, different problems are encountered. The most obvious anomaly is Austrian economists, who are regarded as heterodox in many ways. For example, they do not believe in individual rationality in the mainstream sense, see markets as non-equilibrium systems, note the importance of time, history and change, and emphasise uncertainty. They certainly do not fit into Davis' description of mainstream economics. However, neither do they accord with many aspects of heterodox groups: for instance, they neglect power, they tend to be politically different from other heterodox groups, and they view markets as essentially likely to be effective. They also hold individualism (albeit differently from mainstream economists). Thus they do not fit into Lee's category of heterodox economics either. Similar arguments could be made about many heterodox schools.

It is easy to see why Dequech (2007-8) might have reached his conclusion that apart from in their opposition to the mainstream, there is no way to define heterodox economics. Indeed, finding some definition would seem a difficult task. It would seem that any adequate definition of heterodox must capture its nature as a concatenation; but it must also be able to capture the current diversity of the heterodox community. These two requirements are in many ways contradictory. Another issue here is the question of what type of thing heterodox economics is. Many of the treatments implicitly employ set theory to define heterodox economics. Dequech explicitly uses the term empty set. Other

authors seem to envisage heterodox economics as a crisp, closed set, strictly distinct from mainstream thought. Often, heterodox and mainstream thought seem to be all-encompassing categories (see Mearman, 2007). Indeed, it could be argued that their definitions are constructed in order to construct two mutually exclusive, often encompassing categories or sets.

One issue with sets is that their memberships depend utterly on their definition. There can though be different ways to arrive at these definitions. Some authors may take an Aristotelian or Lockean tack and look for some sort of essence of the object. Lawson's (2006) treatment can be interpreted as claiming that mainstream and heterodox economics have essential properties. Some writers reject such types of claim. Others may take a Wittgensteinian view that categories are based on 'family resemblances' and on uses. So, the term heterodox can be used to describe together groups which have some similarities but may or may not be essentially the same. Or, the meaning of heterodox varies according to use. There is some support for this view in noting that there are a number of ways to slice mainstream from heterodox economics, according the purpose of the writer. Someone, whose focus on policy, might well lump together Austrians and mainstream economists.

One criticism of the above approaches is that they are *a prioristic*. It is possible to define heterodox economics in terms of concepts; but equally it can be defined in terms of populations of self-defined heterodox economists. That way, one can identify heterodox economic ideas but also the make-up of a self-identified heterodox economist. Indeed,

this is the approach taken in recent developments in zoological taxonomy: there has been a move away from thinking in terms of types to thinking in terms of populations of breeding creatures. This may generate an image unpleasant to some: of economists breeding. And of course, in some ways it is an inappropriate metaphor. In other ways, though, it might capture quite well the activities of economists exchanging ideas, acting in communities, borrowing on the genetics of the groups they are in, sharing common ancestors. Such an approach would require an historical account of individual economists, which is beyond the scope of this paper[1]. However, one key idea present in the new zoological taxonomy is adopted here: that of gathering together a 'breeding population' – viz. self-identified heterodox economists – and then building up descriptions of heterodoxy from statements made by those economists about the fundamentals of economics. Such is the goal of this paper.

Data collection

Data was collected via a questionnaire. The questionnaire was received in three ways: 1) questionnaires were distributed at the conference of the Association for Heterodox Economists (AHE) conference in Cambridge, UK in July 2008. An announcement was made by the author at the conference for questionnaires to be completed. It should be noted that in terms of data reliability this may raise concerns because of order effects (see, for example, Macauley, *et al*, 1971). However, these effects are unavoidable in such cases. In order to capture people who did not complete the questionnaire at the time, and

[1] The scale of this task is illustrated by works which might be said to aim to do the same thing: e.g. histories of schools of thought (King, 2002); or works which link past economists to newer ideas, such as Critical Realism (see, for example, Fleetwood, 1996), or general equilibrium theory (Hollander, 1981).

also to capture people who are self-identified heterodox economists by virtue of being AHE members, two further appeals were made to attract respondents via the AHE listserv. Respondents were able to either post or e-mail their responses to the author.

The questionnaire can be viewed in the Appendix. It was headed ‘What are the core economic precepts?’ in order to deflect respondents from its main purpose; namely to ascertain a definition of heterodox economics. The heading also had the benefit of being usable in wider groups of economists. The questionnaire asks respondents to offer their degree of agreement with a series of statements. They could agree completely (with a score of 10), disagree completely (score of 0) or offer partial agreement/disagreement or hedge their answers by choosing intermediate scores. Respondents answered on a sliding scale which had no numbers to guide them. This was done because it was felt that respondents might be driven to choose given numbers. In one particular case, where the score of 5 could have been shown, this may have been a specific concern, partly because it might reduce variation in the data.

The questions were derived from the literature. Principally two main criteria were used for selection: 1) mainstream concepts, in order to assess the extent to which heterodox economics is merely a rejection of the mainstream; and 2) concepts associated with heterodox economics from the literature (link to the discussion above). In order to reflect the literature, a mixture of methodological and theoretical points was included. Inevitably there will be concepts which were potentially includable which have been omitted. The most obvious candidate is any explicit reference to institutions; i.e. the concept of

institutions was not used explicitly, although things which may be considered as institutions (e.g. money) were included. However, many of the concepts included (e.g. history and power) are of relevance to institutionalist economists. The intention in the balance of questions was to address key elements of mainstream economics plus other elements from other constituent schools of heterodox economics. Thus, the inclusion of class should score highly amongst Marxist and Post Keynesian economists, money should score highly with Post Keynesians, uncertainty with Post Keynesaisn and Austrians, power with Marxists and institutionalists, gender with feminists and perhaps institutionalists and Marxists, etc. However, it may also be true that many self-identified heterodox economists retain beliefs held by the mainstream. This explains further the relevance of placing responses on a sliding scale rather than on a yes/no basis.

Data Analysis

The data has been analysed in a range of ways. Descriptive statistics, as ever can aid the narrative considerably. These are followed by a discussion of factor analysis and cluster analysis which were applied to the data.

Descriptive Statistics

43 responses were received. Based on an AHE membership of roughly 250[2], this is a response rate of 17%. This can be considered somewhat disappointing although within the normal range for online surveys. Some of the questionnaires were not completed, with one or two questions unanswered. Descriptive statistics are shown in Table 1.

Table 1 here

The descriptive statistics show is some predictable and some more surprising results. Some questions score higher than others. The variation in responses is quite pronounced, although it differs between questions. There is a strong willingness to recognise oneself as heterodox (unsurprisingly in this context), and to a lesser extent as pluralist. Given that a succession of AHE conferences had adopted the theme of pluralism, perhaps it is not surprising that the score for pluralist is also high, albeit with more variation in responses. The score for mainstream is not high, yet clearly non-zero. The score for natural was also high. This may reflect a bias in the conference participants, given that the 2008 conference contained a stream on ecological economics. There may be some key issues which cause disagreement in the heterodox community. E.g. labour has a large standard deviation. Fallibility and scarcity have also. These may reflect disagreements about pluralism and the role of mainstream respectively. However, there were also high scores for history and power which are traditional heterodox concerns. The scores for uncertain and fallibility are also high, although for both (and particularly fallibility) variation of response is also quite high. These statistics echo those for pluralist. We should note that

[2] No precise figure was available for AHE membership in 2008. The number was 167 in 2006, and 258 in 2007. Each year there are new members but also some memberships lapse. The figure of 250 is a rough estimate.

the overall mean of responses for scarcity was also larger than expected (although this may reflect the possible bias towards ecological economics at the conference). The result for history is particularly important given that it achieved the highest score and with a low variation in responses. History seems a likely candidate to be a foundational concept of heterodox economics. However, this does not mean that it acts as a distinction between heterodox and mainstream economics, because mainstream economists may also respond with a high score for history. However, as shown in Table 2, there is a negative (statistically insignificant) correlation between mainstream and history.

Table 2 here

In some cases, strong correlations are evident. The first thing to note is that there is a clear negative (and statistically significant) correlation between heterodox and mainstream. This statistic supports the thesis that heterodox is analytically defined (at least partly) as a rejection of mainstream economics. However, in an association such as the AHE, such an oppositional stance will inevitably also reflect sociological factors. Also possibly significant is that the opening questions were in terms of how the respondent sees themselves, rather than in judging concepts. If we then look at the correlation between heterodox and mainstream concepts, the picture is less clear. Correlations between heterodox and concepts such as positive, rational, equilibrium, markets, maths and even scarcity are extremely small. There is stronger evidence of rejection of mainstream economic concepts in the stronger correlations between those concepts and specific heterodox concepts: for example, class is strongly negatively

correlated with several mainstream concepts. History is strongly negatively correlated with equilibrium (echoing Robinson, 1974 perhaps), individuals and scarcity. Power has consistent negative correlation with mainstream concepts.

Factor analysis

The correlations suggest (together with the practical need to reduce the data) factor analysis might be appropriate. Significantly, there appear to be significant clustering of concepts which are correlated with each other. Table 2 suggests strong links, for example, between the mainstream concepts, but also a group of concepts which might be called Marxist/radical, including class, power, labour and gender. These associations can be readily assessed by factor analysis, the results of which are shown in Table 3, which displays factors derived by principal components analysis (the PCA is shown in Table A1) after a varimax rotation. The results of this analysis must be treated with care, given that there may be a problem of degrees of freedom. There are sixteen variates shown here and, given incomplete surveys, fewer than 40 observations. The ratio of observations to variates is thus lower than 2.5:1, whereas most treatments of factor analysis usually recommend a ratio of 5:1 or even 10:1 (Hair, et al, 2006: 122).

Table 3 here

Nonetheless, the results shown in Table 3 are intuitively correct and reflect the results from the bivariate correlations shown in Table 2[3]. The first factor has high loadings on class, power, labour, gender and (negatively) markets. Factor 1 is thus viewed as a 'radical' (or perhaps Marxist-feminist) grouping. We shall return to factor 2 in a moment. Factor 3 is an 'Austrian' grouping, associating uncertainty, individualism and fallibility. Factor 4 is perhaps a 'Post Keynesian' group which stresses money and history. Factor 5 is an 'ecological economics' group which stresses natural systems, but also the use of mathematics. Factor 5 may reflect the composition of the 2008 conference.

Factor 2 is a mainstream factor. Significantly, this factor groups rational, equilibrium and scarcity. This may reflect a bias within heterodox economics as to what constitutes the mainstream: i.e. if heterodox economists associate scarcity, equilibrium and rationality with the mainstream, they may reject them more easily. The finding also partly supports Davis' (2009) definition of the mainstream in terms of equilibrium, rationality and individualism. However, the adoption of individualism by Austrian economists means that the adoption of individualism alone cannot be a definition of the mainstream; it also complicates the division between mainstream and heterodox. Further, the mean scores for 'mainstream concepts', although consistently lower than heterodox concepts, are non-zero and in fact in some cases as high as some heterodox concepts (e.g. the score for positive is almost as high as for individuals. Also, although there was a significant negative correlation between mainstream and heterodox, the correlation coefficient was only |.438|, meaning that many respondents regard themselves as mainly an clearly

[3] Further, by removing clusters of variates, according to their likely group membership, the (remaining) factors (with a better ratio of observations to variates) appear robust.

defined heterodox economists – yet with important element of mainstream economics thrown in. Heterodox economists are a mixture of concepts and influences. An alternative interpretation is that heterodox and mainstream are overlapping categories. The other clear finding is that heterodox economics remains a concatenation of ideas (echoing Lee's (2009) term) and groupings of individuals.

The factor analysis suggests robust and strong associations between sets of variables which are intuitively sensible: e.g. Marxist, mainstream, Austrian, PK and ecological economists. Including pluralist as an attitude variable does not generate satisfactory factors.

We should note that two other variates may be considered as part of the factors. The variates 'mainstream' and 'pluralist' were initially included in the survey as outcome or dependent variates. However, given the strong (negative) correlation between heterodox and mainstream, as well as the theoretical position that heterodox is analytically a function of mainstream, and given the debate amongst heterodox economists about the role of pluralism, it might be considered that both are possible determinants of heterodox. Therefore, factor analyses including mainstream and pluralist was run. This worsened the problem of degrees of freedom. The inclusion of the two variates created a sixth factor, which contains only 'mainstream'. This does not make sense as another factor; thus mainstream was removed and the factor analysis was run again. Again there were six factors, none of which has a single member.

There are some significant differences between this set of factors and those shown in Table 3. Factor 1 no longer contains gender as a member and now looks much more like a 'Marxist' rather than a 'radical' factor. Gender has now moved to the 'mainstream' factor (factor 2) albeit with a negative loading. Table 3's Factor 3 containing uncertain, fallibility and individuals (an 'Austrian' factor) has now become two factors, one containing pluralist and fallibility. This is not surprising. Indeed, one might argue that the variates are measuring the same thing. However, it is an interesting finding, given that both have a methodological character not displayed by the other factors and/or variates. Individuals and uncertainty remain coupled, retaining an Austrian flavour. The original Factors 4 and 5 are retained.

A decision has to be made as to whether to select factors in Table 3 or those estimated later. Here we choose to use the original factors, omitting pluralist. That is for the following reasons: 1) the degrees of freedom problem is made worse by using the extra variate; 2) pluralist and fallibility may be mimicking each other (their correlation coefficient is $r = 0.524$); 3) the radical factor is intuitively more plausible for an international dimension of the heterodox movement; 4) the distribution of the original factors is intuitively more appealing than those in the subsequent estimations because i) it echoes schools and ii) all of the factors are on the same level, which makes comparison between them easier[4]. This is an important decision, because it informs the cluster analysis discussed later.

[4] We can imagine schools of thought as layered (Dow, 2004). The concepts of pluralism and fallibility could be said to operate on a lower level than do schools of thought. It is not clear whether these two methodological drivers have the same impact on the school memberships. This could be investigated by looking at the determinants of each factor. Of course, a similar argument about levels could be made within

Regression analysis

Factor analysis can be, as shown above, a useful method for describing data. It is also useful (and perhaps is best known) as a data reduction technique. The analysis thus far has suggested some hints as to the definition of heterodox economics. This analysis can be taken a step further by examining OLS analysis of the determinants of heterodox economics. I.e., run a regression with heterodox as the dependent variable. Again, this is subject to problems of degrees of freedom. It may also be argued that given that we have different types of variates on the right hand side of the equation – specifically some are methodological , some theoretical – it is possible that rather than analyse a single equation, we actually have a set of nested equations. Some logic for this would be in that theoretical positions can be thought to be in some sense generated by methodological ones. However, this is a contentious position to take, in light of debates over prescriptive versus descriptive methodology. If we proceed as usual, via an OLS regression, what is found?

Table 4 here

Regression suggests that factors 1, 3 and 4 have the strongest impact on defining heterodox economics. These are the Marxist, Austrian and PK factors. The mainstream factor is statistically insignificant, suggesting that heterodoxy is best not defined in terms

each factor: e.g. fallibility is within the Austrian factor but seems to operate on a different level from 'individuals'. The former is epistemological and the latter is ontological.

of opposition; despite the strong negative correlation between heterodox and mainstream in terms of self-labelling.

OLS regression results with heterodox as the explanandum and all the 16 concept variates as explanans. This is equation 1 in Table 4. The key finding is that there is little support for any variates as determinants of heterodox economics. The sample size and degrees of freedom mean that it is difficult to ascertain individual statistical significance. Some reduction of the model is necessary. One method is to use some decision criteria to eliminate some of the variables from the original regression. Normally this is done by removing insignificant variates. However, this would result in only one explanatory variate remaining. Thus elimination would take place using less stringent criteria, utilising a higher critical p value and also examining the size of the coefficient. This led to a new estimation (equation 2 in Table 4) with now only 6 explanatory variates (thus removing the degrees of freedom problem). Further reduction of that equation suggests that at the 7% level, the variates uncertain, money, fallibility, gender and individuals are determinants of heterodox economics. This equation appears statistically robust: the DW statistic is within acceptable range, and the VIF and tolerance tests suggest no significant multicollinearity is present.

However, the results seem at odds with the descriptive statistics, which also showed strong correlations between heterodox and variates such as labour and power. The results may simply be the results of the variate deletion processes which were negatively affected by degrees of freedom problems. Another approach to take is therefore to utilise

the information from the factor analysis to produce new explanatory variables. Thus we might run a regression using the factor loadings. Table 4 equation 4 shows the results of this process. The regression coefficients are somewhat unusual in that there are two pairs which have almost identical statistics. Factors 1 (Marxist/radical), 3 (Austrian) and 4 (post Keynesian) are shown to have statistically significant effects on the definition of heterodox, whereas the other factors, the mainstream (factor 2) and the ecological (factor 5) did not. Interestingly, the mainstream factor did not have a negative effect on heterodox. Overall, the factors had little explanatory power, with only 29.5% of the variation in heterodox explained by the variation in the factors. The F statistic does show a significant effect of the explanatory variates however. These results suggest that although clear clusters emerge within the heterodox community, in terms of defining heterodox economics and economists, other factors are at play. It might be claimed that heterodox economics and economists emerge from their constituent schools.

Cluster analysis

Factor analysis assesses relationships of interdependence between variates. However, it is arguable that this method looks at the data inappropriately. We might draw on the literature on taxonomy. This is apt because one of the things we are interested in is whether anything called heterodox economics coheres around individuals. This approach reflects the argument that heterodox economists are able to self-select and that by examining them we can divine what heterodox economics is. Alternatively, if we are confident of what heterodox economics is, we can group economists according to that

definition. Such considerations are the concerns of taxonomy. In that discipline a move has occurred between typological descriptions of objects to one based on genetics (see, for example, Mayr, 1969; Goto, 1982). In new approaches, objects are grouped into phena (i.e. some similarities) and then genetic connections are sought. The latter approach therefore takes certain characteristics as ways of grouping objects (cases). In the literature this is described as *numerical taxonomy*. Such an approach would examine relationships between numerical measures of characteristics of each case. This stage of analysis would then lead to explanations of genetic relationships; however that is beyond the scope of this paper. Analysis here will end at the stage where groupings of cases occur. For this purpose, cluster analysis shall be used. *Cluster analysis* involves the examination of relations between cases rather than between variates.

Cluster analysis has several advantages.[5] Its main advantage that it allows the data to speak – "the classification of data as suggested by natural groupings of the data themselves" (Hair et al, 2006: 559). Cluster analysis allows a variety of research goals to be pursued, and is particularly useful for basic description of complex data sets. Like factor analysis it can be a useful means of data reduction. This flexibility has allowed it to be used in a range of settings, and not just in zoology and related areas. However, there are some disadvantages of cluster analysis. The technique itself will always generate clusters, perhaps giving the impression that more structure present than is actually the case. Cluster analysis is not capable of inference, which to some limits it usefulness. The principal disadvantage of the method is that each clustering identified is highly dependent

[5] Hair, et al (2006, ch. 8) discuss the key concepts in cluster analysis. Much of this discussion draws heavily on that source. Interested readers should consult Hair et al.

on the cluster variates specified by the researcher. Thus, the extent to which the data speak for themselves is severely restricted. Cluster analysis does not avoid, therefore, the problem of *a priori* classification; although it could be said to mitigate it somewhat.

Clusters are formed on the basis of either similarity or dissimiliarity. Either way, some measure of (dis)similarity is necessary. There are two main schools of thought on this question: to use distance measures or correlational measures. The correlational approach suggests that we simply correlate between cases rather than variables. This may allow us to find groupings based on association. Part of this process is to identify what might be described as outliers. At first, outliers will be treated as cases which do not have strong correlations with many other cases. Table 5 is the result of a two stage process of correlation: the first involved straight Pearson correlations between cases across all questions; and the second was to filter out cases which has fewer than 10 significantly significant correlations with other cases[6].

Table 5 here

That process yielded two key observations: that 13 of the 43 original cases were removed and hence could be regarded as disconnected from the main groups; and that the remaining cases seem to have a fairly strong structure. The latter finding is supported by the fact that 116/435 (73%) of the possible remaining strong correlations is statistically significant. These two findings suggest contradictory things about the heterodox

[6] In fact, all of the cases removed at no more than 6 significant correlations with other cases.

community: on the one hand it may be seen to have a strong core; but on the other hand there is a variety of views within it and perhaps some rather peripheral members. The correlations between peripheral members are shown in Table 6. Analysing these peripheral members suggests mini clusters form, e.g. between cases 16, 18, and 35. However, this group has connection with the rest of the cohort, through case 12, which is itself connected to other outlier cases, 27 and 40, but also to the core group via cases 28 and 41. The community of heterodox economics then looks like a complex web of interconnections, in which some members are strongly similar to most of the group, others are only strongly connected to a couple of others, and there is a range of other strengths and extents of connection elsewhere. Aside from these general observations, though, not much can be said about the nature of the heterodox community without engaging in a detailed analysis of individual cases. The particular factor which may have separated cases 16, 18, and 35 from the rest was their low response (on average 1.5 compared to a sample average of 6.6) to the question about class. However, there is no obvious biographical reason for this difference. The outlier cases 12, 27 and 40 may have become so because of their (above average) response to the question about positive economics.

Correlational methods look at patterns in the cases but not the distances between them, so they are perhaps less able to identify similarity. The distance method allows us to begin forming clusters on the basis of (dis)similarity in terms of distance. This occurs iteratively, as the most similar (least dissimilar) observations are progressively grouped together. Ultimately, one cluster may form (unless we choose to specify the number of

clusters which will form). In this sense, cluster analysis is agglomerative[7]. Also, though, because it is iterative, we arrive at hierarchical clusters in which the early clusters have closer relationships between cases than the later ones do[8]. The agglomeration coefficient shows this progression of clustering: we can evaluate the breaks in the agglomeration process by observing the changes in that coefficient. Small changes indicate that new clusters are being formed by adding cases which are close to the existing cluster. However, it is not clear what constitutes changes which are large and which are small, which demands the researcher introduce their own judgement into the process.

Even if one chooses to use distance measures in the formation of clusters, there is still a choice to be made. Several options are available, but perhaps the most popular is the Squared Euclidean distance (SqED). It has a number of advantages (see Hair et al, 2006: 575) one of which being that is used in the Ward's method of clustering. It is also the default measure in SPSS. Then one must choose a clustering algorithm. There are several options available, all with advantages and disadvantages, mainly in terms of their ability to form clusters. Ward's method, for example, is more likely to construct clusters of roughly equal sizes. It is susceptible to outliers but in our data set that is not much of an issue. Here it was decided, as an exploratory move, to use Ward's method and the average linkage method and compare findings. Average linkage methods were less likely to be affected by outliers, but also are less likely to form nice clusters. Using both involves a trade-off. Hair et al (2006: 590) describe these two methods as "probably

[7] As Hair *et al* (2006: 584) note, cluster formation can be divisive, i.e. it begins with all cases in a single cluster and then breaks that down into smaller groups of cases. Most computer packages appear to be agglomerative: SPSS takes that approach.
[8] It is also possible to have non-hierarchical cluster methods (see Hair *et al*, 2006: 581, 585).

being the best available". However, all hierarchical methods do have problems, for instance of the persistence of early clusters and the influence of outliers. Hair et al (591) recommend that some trial and error is used, to test whether the structures identified would change if outliers are excluded.

An early stage in cluster analysis is to try to identify outliers (as is the case in other empirical techniques). This has been suggested above. In cluster analysis there are various ways of doing this, but usually the choice is between different measures of distance across n-dimensional space. Cases can be made for various measures, but here the squared Euclidean distance (SqED) shall be used. SPSS produces a proximity matrix which shows the distance of each case from each other. Cases which appear not to be close to (m)any others (i.e. have high values on (most) all SqEDs) could be considered outliers and may be considered for exclusion from the analysis – though this is a risky manoeuvre. Conversely, cases which have short distances between them might be considered similar and may be grouped together.

Proximity matrices assess the SqED between cases measured across some grouping variables. At this stage, because we are trying to identify a species of heterodox economist, it does not seem appropriate to include or reduce variables. One exception is to remove variables for which the cases did not respond. Proximity matrices can be useful for identifying outliers: cases which have high SqED from most other cases could be considered outliers. Our proximity matrix tried to capture as much information about cases as possible and we chose to group the data according to the following variates:

positive, uncertain, fallibility, power, scarcity, gender, maths, markets, history, heterodox and pluralist. These were the only variates for which complete responses were received. In our proximity matrix[9], there are very few large values at all, and there are very few cases which have consistently large values. Possible candidates are cases 5, 8, 11, 12, 16, 18, 19, 23, 31, 32, 35, 40. Of these, 5, 8, 11, 18, 31, 35, and 40 are have SqED consistently above 1 for all cases and some scores of over 4 for some cases (these results only cover the between-groups average linkage method – Ward's produces slightly different results). This suggests that these observations may lay outside any core set of heterodox economists. However, it may be more valuable to leave them in the analysis than out. Also, as with all cluster analyses (and indeed all numerical taxonomy), the results are sensitive to the grouping variable chosen. There are not clear clusters from this analysis. That is true even for the results from Ward's method.

One issue is how one goes about clustering cases. In zoology, for instance, some characteristic has to be chosen as the basis for grouping cases. The debate between typology (species as ideal types) and species as empirically breeding populations is thus undercut. Some *a priori* choice must be made as to how to group the cases. This issue was already confronted when calculating proximity: in this case, SPSS grouped on eleven variates. However, in cluster analysis a deliberate choice must be made. Nor is it possible to simply allow an automatic choice to be made by the processing software: this is methodologically unsatisfactory as it sacrifices the judgement of the investigator; and in any case, cluster analysis requires that the variates used are independent of each other

[9] The proximity matrix is not shown. It is available from the author on request.

(without altering the fact that cluster analysis is an interdependence technique). There is some debate about the merits of using factors extracted from the data (as above) (see Hair et al, p. 582); their chief benefit being that they ensure independence of variates. An alternative method is to take variables from each of the factors as the clustering characteristics. In this instance, because of the exploratory nature of this work, both options were chosen. The goal was to seek any structure of clusters which might be in the data. This may be criticised as blind empiricism.

A range of clusters were attempted, using a variety of grouping variates. To maximise the usefulness of the data, and so as not to exclude any cases, only variates which had complete response sets were used. The factor analysis also had an impact here. First, cluster analysis was attempted with the factors as grouping variates. As a variant on this, subsequently the bases for clusters were groups of variates which were identified as belonging to different factors. In each case, SPSS produces an agglomeration schedule and a dendrogram, the latter giving a visual sketch of relations between cases. Three sets of results are shown in Tables 7-9 and in Figures 1-3.

Table 7 and Figure 1 show clusters based on the factors extracted above. Table 8 and Figure 2 show clusters based on maths, history, fallibility, power and positive. Table 9 and Figure 3 show clusters based on maths, history, fallibility, gender and scarcity. In all three cases, both average linkage and Ward's methods were used. In the first case, the agglomeration schedules suggest at least nine clusters, i.e. little structure. The dendrograms suggest 5 or 6 clusters of varying sizes, with some cases which appear

isolated from the others. Interestingly many of these outlier cases are similar to those identified by the correlational method (above). Both dendrograms in Figure 1 suggest two large clusters of 15 and 7 members respectively, which suggests some structure. Table 8 and Figure 2 tell a similar story; the only slight variant is that Ward's method shows a clearer structure of five distinct clusters. There is then more coherence evident here; but far from an homogeneous group of heterodox economists. Table 9 and Figure 3 reiterate the story of some structure, but of a highly variegated group with some cases rather set apart from the others. Again, some analysis of the specific answers by specific cases may be instructive.

The first point to note is that there is little agreement across the three sets of results in terms of specific groupings of cases. As above, cases 4, 23 and 11 may be related, as may be 5 and 8, and 16 and 18; however, these are not consistent across the three. What is interesting about 5 and 8 is that on inspection, their responses do not seem unusual for the sample; and their responses for 'pluralist' are diametrically opposite. In Figure 2, distinct clusters can be found across both methods comprising 12, 27, 2 and 29; and 1, 8, 4, 23, 11, and 5; and 18, 31, 33, 35, and 36. For the first group, they are separated from the rest by their high responses to 'positive'. Te second group scored lower than average on 'fallibility'. The final group all share low scores on the question about equilibrium (although there are other low scores – so this cannot explain their isolatedness). These clusters reinforce the heterogeneity of the heterodox community; and they show that the community is perhaps carved upon along specific issues, or foci, or emphases. That is what one might expect in a group composed of other, distinct, established groups.

Conclusion

However, the pertinent question is whether or not to regard these groups as separate. In the taxonomy literature, a distinction is often made between ‘lumpers’ and ‘splitters’ – those whose instinct is to, respectively, lump together similar but different cases, or emphasise the differences and split them up. Whenever a category is made, there is a dynamic between the desire to analyse and the desire to lump. The desire to analyse is reinforced by a desire to split. The difference between lumpers and splitters is defined by their emphasis of similarity or of difference. The empirical evidence here supports either urge: it suggests considerable heterogeneity in that little structure can be found within the community of self-identified heterodox economists. However, in other ways, there are reasons to lump: there is a shared dislike of the mainstream; and concepts such as history are almost universally held.

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Tables and Figures

Table 1: Descriptive statistics of survey data

	N	Minimum	Maximum	Mean	Std. Deviation
mainstream	42	.00	.50	.1369	.17428
heterodox	43	.45	1.00	.8221	.19436
pluralist	43	.00	1.00	.7105	.29207
rational	42	.00	.80	.2226	.22009
equilibrium	42	.00	1.00	.1774	.22475
class	42	.00	1.00	.6643	.26898
positive	43	.00	.80	.2047	.24344
natural	42	.10	1.00	.7155	.25097
uncertain	43	.00	1.00	.7291	.25053
fallibility	43	.00	1.00	.7093	.31496
power	43	.00	1.00	.8047	.25816
labour	42	.00	1.00	.6833	.32753
scarcity	43	.00	1.00	.3651	.30910
gender	43	.00	1.00	.5558	.30437
maths	43	.00	1.00	.3488	.28316
individuals	42	.00	.95	.2190	.23084
markets	43	.00	.95	.3058	.25523
money	41	.00	1.00	.5488	.29717
history	43	.30	1.00	.9081	.12580
Valid N (listwise)	38				

Table 2: Correlations between variables (see 130209 2 spo)

Correlations

		ainstrea	eterodo	pluralist	rational	quilibriu	class	positive	natural	ncertai	allibility	power	labour	scarcity	gender	maths	dividua	narkets	money	history
mainstr	Pearson Co	1	-.438*	-.026	.091	.035	-.266	.062	-.138	-.094	-.086	-.520*	-.369*	.415*	-.185	-.116	-.118	.163	-.270	-.102
	Sig. (2-tailed		.004	.871	.572	.827	.093	.696	.391	.552	.588	.000	.018	.006	.240	.466	.461	.302	.092	.520
	N	42	42	42	41	41	41	42	41	42	42	42	41	42	42	42	41	42	40	42
heterod	Pearson Co	-.438*	1	.155	.053	.086	.261	-.041	.127	.130	.376*	.276	.317*	-.020	.265	.151	.181	.072	.428*	.136
	Sig. (2-tailed	.004		.320	.741	.588	.095	.793	.422	.408	.013	.074	.041	.901	.085	.334	.250	.648	.005	.384
	N	42	43	43	42	42	42	43	42	43	43	43	42	43	43	43	42	43	41	43
pluralist	Pearson Co	-.026	.155	1	.128	.064	.079	-.050	-.018	.154	.524*	.171	-.018	.077	.213	-.013	.098	-.091	.007	.150
	Sig. (2-tailed	.871	.320		.418	.687	.618	.750	.908	.326	.000	.274	.911	.625	.170	.935	.536	.561	.965	.337
	N	42	43	43	42	42	42	43	42	43	43	43	42	43	43	43	42	43	41	43
rational	Pearson Co	.091	.053	.128	1	.396*	-.239	.360*	-.012	-.221	.083	-.249	-.082	.310*	-.300	-.165	.067	.331*	.234	-.087
	Sig. (2-tailed	.572	.741	.418		.010	.133	.019	.939	.159	.601	.111	.612	.046	.054	.296	.679	.032	.142	.582
	N	41	42	42	42	41	41	42	41	42	42	42	41	42	42	42	41	42	41	42
equilibri	Pearson Co	.035	.086	.064	.396*	1	-.262	.698*	-.177	-.283	.104	-.221	.077	.339*	-.343*	-.036	.359*	.143	.046	-.332*
	Sig. (2-tailed	.827	.588	.687	.010		.098	.000	.269	.069	.514	.161	.634	.028	.026	.823	.021	.365	.776	.032
	N	41	42	42	41	42	41	42	41	42	42	42	41	42	42	42	41	42	40	42
class	Pearson Co	-.266	.261	.079	-.239	-.262	1	-.316*	.041	.003	.133	.592*	.697*	-.258	.607*	.345*	-.349*	-.484*	.126	.207
	Sig. (2-tailed	.093	.095	.618	.133	.098		.042	.799	.984	.399	.000	.000	.099	.000	.025	.025	.001	.439	.188
	N	41	42	42	41	41	42	42	41	42	42	42	41	42	42	42	41	42	40	42
positive	Pearson Co	.062	-.041	-.050	.360*	.698*	-.316*	1	-.120	-.394*	-.033	-.259	.012	.402*	-.551*	.091	.286	.211	.199	-.233
	Sig. (2-tailed	.696	.793	.750	.019	.000	.042		.449	.009	.833	.094	.941	.008	.000	.563	.067	.174	.212	.133
	N	42	43	43	42	42	42	43	42	43	43	43	42	43	43	43	42	43	41	43
natural	Pearson Co	-.138	.127	-.018	-.012	-.177	.041	-.120	1	.103	.164	.366*	-.046	.083	.250	.327*	-.043	.064	.103	.099
	Sig. (2-tailed	.391	.422	.908	.939	.269	.799	.449		.518	.300	.017	.774	.600	.110	.035	.786	.688	.523	.533
	N	41	42	42	41	41	41	42	42	42	42	42	42	42	42	42	42	42	41	42
uncertai	Pearson Co	-.094	.130	.154	-.221	-.283	.003	-.394*	.103	1	.460*	.140	.005	-.215	.376*	-.322*	.295	.244	-.042	-.004
	Sig. (2-tailed	.552	.408	.326	.159	.069	.984	.009	.518		.002	.372	.975	.166	.013	.035	.058	.115	.795	.980
	N	42	43	43	42	42	42	43	42	43	43	43	42	43	43	43	42	43	41	43
fallibility	Pearson Co	-.086	.376*	.524*	.083	.104	.133	-.033	.164	.460*	1	.226	.116	.256	.238	-.071	.280	.197	.108	.073
	Sig. (2-tailed	.588	.013	.000	.601	.514	.399	.833	.300	.002		.146	.465	.098	.125	.650	.072	.205	.501	.641
	N	42	43	43	42	42	42	43	42	43	43	43	42	43	43	43	42	43	41	43
power	Pearson Co	-.520*	.276	.171	-.249	-.221	.592*	-.259	.366*	.140	.226	1	.436*	-.339*	.481*	.266	-.222	-.356*	.106	.248
	Sig. (2-tailed	.000	.074	.274	.111	.161	.000	.094	.017	.372	.146		.004	.026	.001	.085	.158	.019	.510	.109
	N	42	43	43	42	42	42	43	42	43	43	43	42	43	43	43	42	43	41	43
labour	Pearson Co	-.369*	.317*	-.018	-.082	.077	.697*	.012	-.046	.005	.116	.436*	1	-.153	.362*	.303	-.152	-.414*	.242	.232
	Sig. (2-tailed	.018	.041	.911	.612	.634	.000	.941	.774	.975	.465	.004		.334	.018	.051	.336	.006	.128	.140
	N	41	42	42	41	41	41	42	42	42	42	42	42	42	42	42	42	42	41	42
scarcity	Pearson Co	.415*	-.020	.077	.310*	.339*	-.258	.402*	.083	-.215	.256	-.339*	-.153	1	-.219	.115	.281	.298	-.072	-.251
	Sig. (2-tailed	.006	.901	.625	.046	.028	.099	.008	.600	.166	.098	.026	.334		.158	.462	.072	.053	.655	.104
	N	42	43	43	42	42	42	43	42	43	43	43	42	43	43	43	42	43	41	43
gender	Pearson Co	-.185	.265	.213	-.300	-.343*	.607*	-.551*	.250	.376*	.238	.481*	.362*	-.219	1	.086	-.186	-.213	-.069	.243
	Sig. (2-tailed	.240	.085	.170	.054	.026	.000	.000	.110	.013	.125	.001	.018	.158		.582	.237	.171	.669	.117
	N	42	43	43	42	42	42	43	42	43	43	43	42	43	43	43	42	43	41	43
maths	Pearson Co	-.116	.151	-.013	-.165	-.036	.345*	.091	.327*	-.322*	-.071	.266	.303	.115	.086	1	-.129	-.227	.194	.228
	Sig. (2-tailed	.466	.334	.935	.296	.823	.025	.563	.035	.035	.650	.085	.051	.462	.582		.415	.143	.224	.142
	N	42	43	43	42	42	42	43	42	43	43	43	42	43	43	43	42	43	41	43
individu	Pearson Co	-.118	.181	.098	.067	.359*	-.349*	.286	-.043	.295	.280	-.222	-.152	.281	-.186	-.129	1	.431*	-.037	-.394*
	Sig. (2-tailed	.461	.250	.536	.679	.021	.025	.067	.786	.058	.072	.158	.336	.072	.237	.415		.004	.816	.010
	N	41	42	42	41	41	41	42	42	42	42	42	42	42	42	42	42	42	41	42
markets	Pearson Co	.163	.072	-.091	.331*	.143	-.484*	.211	.064	.244	.197	-.356*	-.414*	.298	-.213	-.227	.431*	1	.141	-.113
	Sig. (2-tailed	.302	.648	.561	.032	.365	.001	.174	.688	.115	.205	.019	.006	.053	.171	.143	.004		.380	.472
	N	42	43	43	42	42	42	43	42	43	43	43	42	43	43	43	42	43	41	43
money	Pearson Co	-.270	.428*	.007	.234	.046	.126	.199	.103	-.042	.108	.106	.242	-.072	-.069	.194	-.037	.141	1	.301
	Sig. (2-tailed	.092	.005	.965	.142	.776	.439	.212	.523	.795	.501	.510	.128	.655	.669	.224	.816	.380		.056
	N	40	41	41	41	40	40	41	41	41	41	41	41	41	41	41	41	41	41	41
history	Pearson Co	-.102	.136	.150	-.087	-.332*	.207	-.233	.099	-.004	.073	.248	.232	-.251	.243	.228	-.394*	-.113	.301	1
	Sig. (2-tailed	.520	.384	.337	.582	.032	.188	.133	.533	.980	.641	.109	.140	.104	.117	.142	.010	.472	.056	
	N	42	43	43	42	42	42	43	42	43	43	43	42	43	43	43	42	43	41	43

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

Table 3: Factor Analysis results

Rotated Component Matrix[a]

	Component				
	1	2	3	4	5
class	.871	-.241	-.009	.079	.023
labour	.859	.171	.015	.197	-.037
power	.686	-.280	.152	.095	.283
markets	-.647	.191	.447	.234	.047
gender	.532	-.501	.339	-.054	.187
equilibrium	.022	.859	.062	-.050	-.138
positive	-.140	.846	-.121	.125	-.020
scarcity	-.315	.560	.159	-.136	.390
rational	-.280	.473	.056	.452	-.104
uncertain	-.013	-.386	.802	-.071	-.130
fallibility	.163	.108	.785	.131	.148
individuals	-.229	.419	.581	-.267	-.032
money	.116	.156	.058	.812	.057
history	.165	-.390	-.131	.648	.152
natural	-.029	-.207	.175	.088	.802
maths	.377	.113	-.328	.086	.684

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 7 iterations.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.643
Bartlett's Test of Sphericity	Approx. Chi-Square	245.629
	df	120
	Sig.	.000

Table 4: OLS Regression results (dependent variable: heterodox)

Variate	Equation 1	Equation 2	Equation 3	Equation 4
constant	.569	.500	.523	.831
pluralist	.026			
rational	-.056			
equilibrium	-.055			
class	-.125			
positive	-.014			
natural	-.038			
uncertain	-.251	-.220	-.234	
fallibility	.167	.183*	.188*	
power	.013			
labour	.157	.055		
scarcity	.028			
gender	.308	.237*	.262**	
maths	-.077			
individuals	.212	.232	.229	
markets	.000			
money	.277*	.259**	.274**	
history	-.021			
FAC1				.07**
FAC2				.02
FAC3				.07**
FAC4				.059**
FAC5				.019
Adjusted R^2	.174	.355	.366	.295
F-statistic	1.471	4.672	5.613	4.175
DW	1.929	2.137	2.139	2.089

* significant at 5% level
** significant at 1% level

Table 5: Correlations between ‘core’ cases

	1	2	3	5	6	7	8	9	10	13	14	15	17	20	21	22	24	25	26	28	29	30	32	34	36	38	39	41	42	43
1				x	x	x	x	x	x	x	x	x	x	x		x	x	x	x		x	x	x	x	x	x	x			x
2			x			x		x								x		x			x	x	x				x		x	
3							x			x	x	x		x		x		x					x							x
5					x		x		x	x	x		x	x		x	x	x				x		x	x			x		x
6						x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x
7								x		x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x
8									x	x	x	x						x		x			x	x						x
9										x	x	x		x		x	x	x	x		x	x	x	x	x	x	x	x	x	x
10										x			x	x		x		x			x	x	x	x	x			x		
13											x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
14												x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
15													x	x		x	x	x	x		x	x	x	x	x	x		x	x	x
17														x		x	x	x			x	x		x	x		x	x		x
20															x	x	x	x	x	x	x	x		x	x	x	x	x	x	x
21																				x	x			x	x	x	x	x	x	
22																	x	x	x		x	x	x	x	x	x	x	x	x	x
24																		x	x	x	x	x		x	x	x	x		x	x
25																			x		x	x	x	x	x	x	x	x	x	x
26																					x	x		x	x	x	x		x	x
28																								x	x	x	x	x	x	x
29																						x	x	x	x	x	x	x	x	x
30																							x	x	x	x	x	x	x	x
32																								x	x		x	x	x	
34																									x	x	x	x	x	x
36																										x	x	x	x	x
38																											x	x	x	x
39																												x	x	x
41																													x	x
42																														x
43																														

Table 6: Correlations between 'marginal' cases

	4	11	12	16	18	19	23	27	31	33	35	37	40	Other (n)	Total
4							x							2	3
11							x							4	5
12				x				x					x	2	5
16			x								x			0	2
18											x			0	1
19										x				5	6
23	x	x										x		1	4
27			x											2	3
31										x				5	6
33						x			x					3	5
35				x	x									0	2
37							x						x	4	6
40			x					x						1	3

Significant correlations with other cases are not shown here.

Table 7a: Agglomeration Schedule for average linkage method; cluster variates: factors extracted in Table 3

Agglomeration Schedule

Stage	Cluster Combined		Coefficients	Stage Cluster First Appears		Next Stage
	Cluster 1	Cluster 2		Cluster 1	Cluster 2	
1	26	36	.049	0	0	8
2	6	39	.269	0	0	4
3	19	20	.366	0	0	15
4	6	32	.655	2	0	8
5	14	34	.933	0	0	17
6	7	15	.945	0	0	23
7	2	28	.961	0	0	27
8	6	26	.963	4	1	11
9	42	43	1.127	0	0	21
10	4	23	1.381	0	0	26
11	6	22	1.410	8	0	19
12	33	37	1.519	0	0	22
13	5	8	1.543	0	0	23
14	13	17	1.607	0	0	20
15	19	41	1.686	3	0	22
16	16	38	1.860	0	0	25
17	14	30	1.864	5	0	24
18	1	9	2.082	0	0	25
19	6	29	2.181	11	0	21
20	10	13	2.727	0	14	28
21	6	42	2.827	19	9	24
22	19	33	3.509	15	12	27
23	5	7	3.839	13	6	34
24	6	14	3.869	21	17	28
25	1	16	4.036	18	16	29
26	4	11	4.235	10	0	33
27	2	19	4.375	7	22	30
28	6	10	5.121	24	20	30
29	1	18	5.804	25	0	32
30	2	6	6.908	27	28	32
31	12	40	7.099	0	0	35
32	1	2	8.512	29	30	33
33	1	4	9.229	32	26	34
34	1	5	10.169	33	23	35
35	1	12	14.964	34	31	36
36	1	31	18.823	35	0	37
37	1	21	20.523	36	0	38
38	1	35	21.263	37	0	0

Table 7b: Agglomeration Schedule: Ward's method; cluster variates: factors extracted in Table 3

Agglomeration Schedule

Stage	Cluster Combined		Coefficients	Stage Cluster First Appears		Next Stage
	Cluster 1	Cluster 2		Cluster 1	Cluster 2	
1	26	36	.024	0	0	10
2	6	39	.159	0	0	4
3	19	20	.342	0	0	18
4	6	32	.734	2	0	16
5	14	34	1.200	0	0	21
6	7	15	1.672	0	0	24
7	2	28	2.153	0	0	28
8	42	43	2.717	0	0	20
9	4	23	3.407	0	0	22
10	22	26	4.103	0	1	15
11	33	37	4.862	0	0	25
12	5	8	5.634	0	0	24
13	13	17	6.437	0	0	19
14	16	38	7.367	0	0	23
15	22	29	8.352	10	0	20
16	6	30	9.375	4	0	21
17	1	9	10.416	0	0	23
18	19	41	11.479	3	0	25
19	10	13	13.029	0	13	31
20	22	42	15.087	15	8	29
21	6	14	17.545	16	5	29
22	4	11	20.139	9	0	34
23	1	16	23.189	17	14	27
24	5	7	26.406	12	6	35
25	19	33	29.663	18	11	28
26	12	40	33.213	0	0	33
27	1	18	36.852	23	0	30
28	2	19	41.254	7	25	32
29	6	22	47.236	21	20	31
30	1	31	54.217	27	0	37
31	6	10	61.668	29	19	35
32	2	21	69.624	28	0	34
33	12	35	79.395	26	0	36
34	2	4	92.804	32	22	36
35	5	6	111.499	24	31	38
36	2	12	134.846	34	33	37
37	1	2	160.974	30	36	38
38	1	5	190.000	37	35	0

Table 8a: Agglomeration Schedule: average linkage method; cluster variates: maths, power, fallibility, positive, fallibility

Agglomeration Schedule

Stage	Cluster Combined		Coefficients	Stage Cluster First Appears		Next Stage
	Cluster 1	Cluster 2		Cluster 1	Cluster 2	
1	7	26	.003	0	0	3
2	14	43	.010	0	0	9
3	7	36	.011	1	0	7
4	15	32	.015	0	0	14
5	3	41	.015	0	0	16
6	22	30	.015	0	0	12
7	7	42	.016	3	0	10
8	12	27	.018	0	0	23
9	14	34	.025	2	0	17
10	7	39	.027	7	0	17
11	13	28	.030	0	0	19
12	6	22	.033	0	6	15
13	9	38	.035	0	0	18
14	15	25	.038	4	0	20
15	6	20	.041	12	0	16
16	3	6	.048	5	15	25
17	7	14	.055	10	9	19
18	9	24	.060	13	0	20
19	7	13	.075	17	11	24
20	9	15	.099	18	14	24
21	2	29	.110	0	0	23
22	4	23	.123	0	0	33
23	2	12	.129	21	8	32
24	7	9	.134	19	20	25
25	3	7	.184	16	24	32
26	1	8	.223	0	0	38
27	16	33	.233	0	0	34
28	5	11	.250	0	0	33
29	10	17	.253	0	0	35
30	37	40	.253	0	0	39
31	18	31	.265	0	0	40
32	2	3	.271	23	25	36
33	4	5	.281	22	28	38
34	16	35	.344	27	0	40
35	10	19	.356	29	0	37
36	2	21	.490	32	0	37
37	2	10	.563	36	35	39
38	1	4	.702	26	33	41
39	2	37	.762	37	30	41
40	16	18	.823	34	31	42
41	1	2	.958	38	39	42
42	1	16	1.175	41	40	0

Table 8b: Agglomeration Schedule: Ward's method; cluster variates: maths, power, fallibility, positive, fallibility

Agglomeration Schedule

Stage	Cluster Combined		Coefficients	Stage Cluster First Appears		Next Stage
	Cluster 1	Cluster 2		Cluster 1	Cluster 2	
1	7	26	.001	0	0	3
2	14	43	.006	0	0	10
3	7	36	.013	1	0	8
4	15	32	.021	0	0	14
5	3	41	.028	0	0	17
6	22	30	.036	0	0	13
7	12	27	.045	0	0	22
8	7	42	.054	3	0	12
9	13	28	.069	0	0	21
10	14	34	.084	2	0	20
11	9	38	.102	0	0	16
12	7	39	.120	8	0	20
13	6	22	.139	0	6	15
14	15	25	.161	4	0	23
15	6	20	.185	13	0	17
16	9	24	.220	11	0	23
17	3	6	.262	5	15	30
18	2	29	.317	0	0	22
19	4	23	.378	0	0	31
20	7	14	.456	12	10	21
21	7	13	.536	20	9	34
22	2	12	.633	18	7	35
23	9	15	.742	16	14	34
24	1	8	.853	0	0	37
25	16	33	.969	0	0	32
26	5	11	1.094	0	0	31
27	10	17	1.220	0	0	33
28	37	40	1.347	0	0	35
29	18	31	1.479	0	0	38
30	3	19	1.646	17	0	33
31	4	5	1.835	19	26	37
32	16	35	2.025	25	0	38
33	3	10	2.321	30	27	39
34	7	9	2.617	21	23	36
35	2	37	2.934	22	28	39
36	7	21	3.325	34	0	40
37	1	4	4.061	24	31	41
38	16	18	4.847	32	29	41
39	2	3	5.879	35	33	40
40	2	7	7.430	39	36	42
41	1	16	9.973	37	38	42
42	1	2	13.487	41	40	0

Table 9a: Agglomeration schedule: average linkage method; cluster variates: maths, history, scarcity, fallibility, gender

Agglomeration Schedule

Stage	Cluster Combined		Coefficients	Stage Cluster First Appears		Next Stage
	Cluster 1	Cluster 2		Cluster 1	Cluster 2	
1	3	20	.010	0	0	10
2	22	30	.015	0	0	17
3	14	26	.023	0	0	7
4	15	25	.028	0	0	21
5	9	38	.033	0	0	12
6	2	41	.035	0	0	25
7	14	43	.036	3	0	11
8	33	37	.040	0	0	23
9	6	36	.040	0	0	13
10	3	13	.058	1	0	30
11	14	34	.058	7	0	20
12	9	12	.066	5	0	24
13	6	39	.070	9	0	22
14	7	32	.070	0	0	27
15	27	28	.083	0	0	18
16	4	23	.093	0	0	31
17	22	29	.095	2	0	22
18	27	42	.096	15	0	25
19	18	35	.115	0	0	35
20	14	24	.118	11	0	32
21	1	15	.134	0	4	29
22	6	22	.138	13	17	27
23	10	33	.170	0	8	31
24	9	16	.190	12	0	28
25	2	27	.209	6	18	28
26	5	11	.250	0	0	37
27	6	7	.253	22	14	29
28	2	9	.266	25	24	33
29	1	6	.275	21	27	32
30	3	19	.298	10	0	33
31	4	10	.336	16	23	34
32	1	14	.431	29	20	36
33	2	3	.465	28	30	36
34	4	40	.509	31	0	38
35	18	21	.528	19	0	39
36	1	2	.623	32	33	38
37	5	8	.728	26	0	41
38	1	4	.749	36	34	39
39	1	18	.880	38	35	40
40	1	17	1.188	39	0	42
41	5	31	1.198	37	0	42
42	1	5	1.423	40	41	0

Table 9b: Agglomeration schedule: Ward's method; cluster variates: maths, history, scarcity, fallibility, gender

Agglomeration Schedule

Stage	Cluster Combined		Coefficients	Stage Cluster First Appears		Next Stage
	Cluster 1	Cluster 2		Cluster 1	Cluster 2	
1	3	20	.005	0	0	12
2	22	30	.013	0	0	24
3	14	26	.024	0	0	9
4	15	25	.038	0	0	21
5	9	38	.054	0	0	14
6	2	41	.071	0	0	26
7	33	37	.091	0	0	22
8	6	36	.111	0	0	19
9	14	43	.132	3	0	11
10	7	32	.167	0	0	28
11	14	34	.202	9	0	20
12	3	13	.239	1	0	33
13	29	39	.276	0	0	19
14	9	12	.315	5	0	25
15	27	28	.356	0	0	17
16	4	23	.402	0	0	35
17	27	42	.453	15	0	27
18	18	35	.510	0	0	31
19	6	29	.589	8	13	24
20	14	24	.670	11	0	37
21	1	15	.755	0	4	28
22	10	33	.861	0	7	29
23	5	11	.986	0	0	34
24	6	22	1.114	19	2	32
25	9	16	1.243	14	0	30
26	2	40	1.384	6	0	29
27	19	27	1.597	0	17	38
28	1	7	1.861	21	10	32
29	2	10	2.155	26	22	35
30	9	21	2.478	25	0	31
31	9	18	2.837	30	18	38
32	1	6	3.224	28	24	40
33	3	17	3.622	12	0	37
34	5	8	4.065	23	0	36
35	2	4	4.664	29	16	39
36	5	31	5.420	34	0	41
37	3	14	6.219	33	20	40
38	9	19	7.247	31	27	39
39	2	9	8.537	35	38	42
40	1	3	10.009	32	37	41
41	1	5	12.535	40	36	42
42	1	2	16.102	41	39	0

Figure 1a: Dendrogram; average linkage method; cluster variates: factors extracted in Table 3

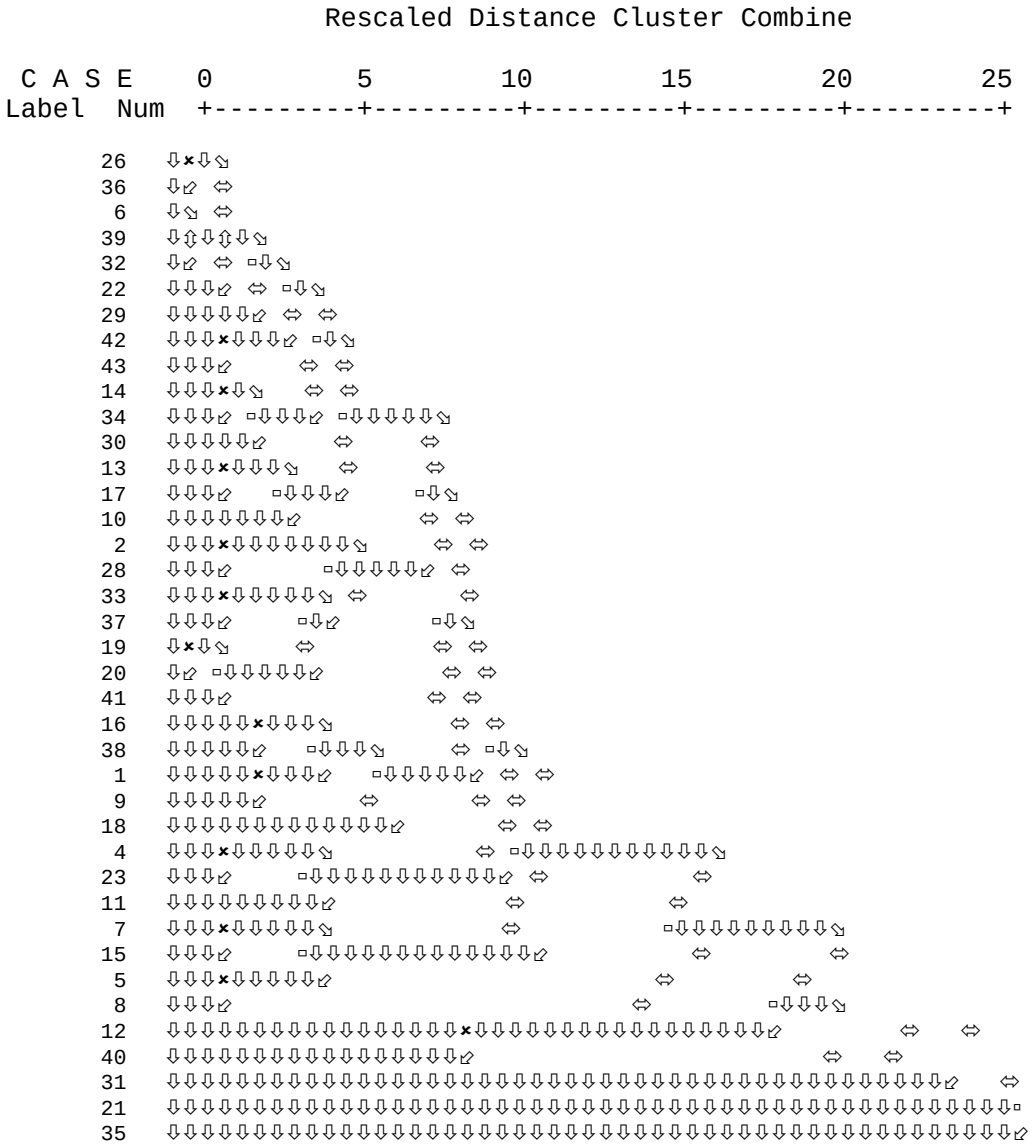


Figure 1b: Dendrogram; Ward's method; cluster variates: factors extracted in Table 3

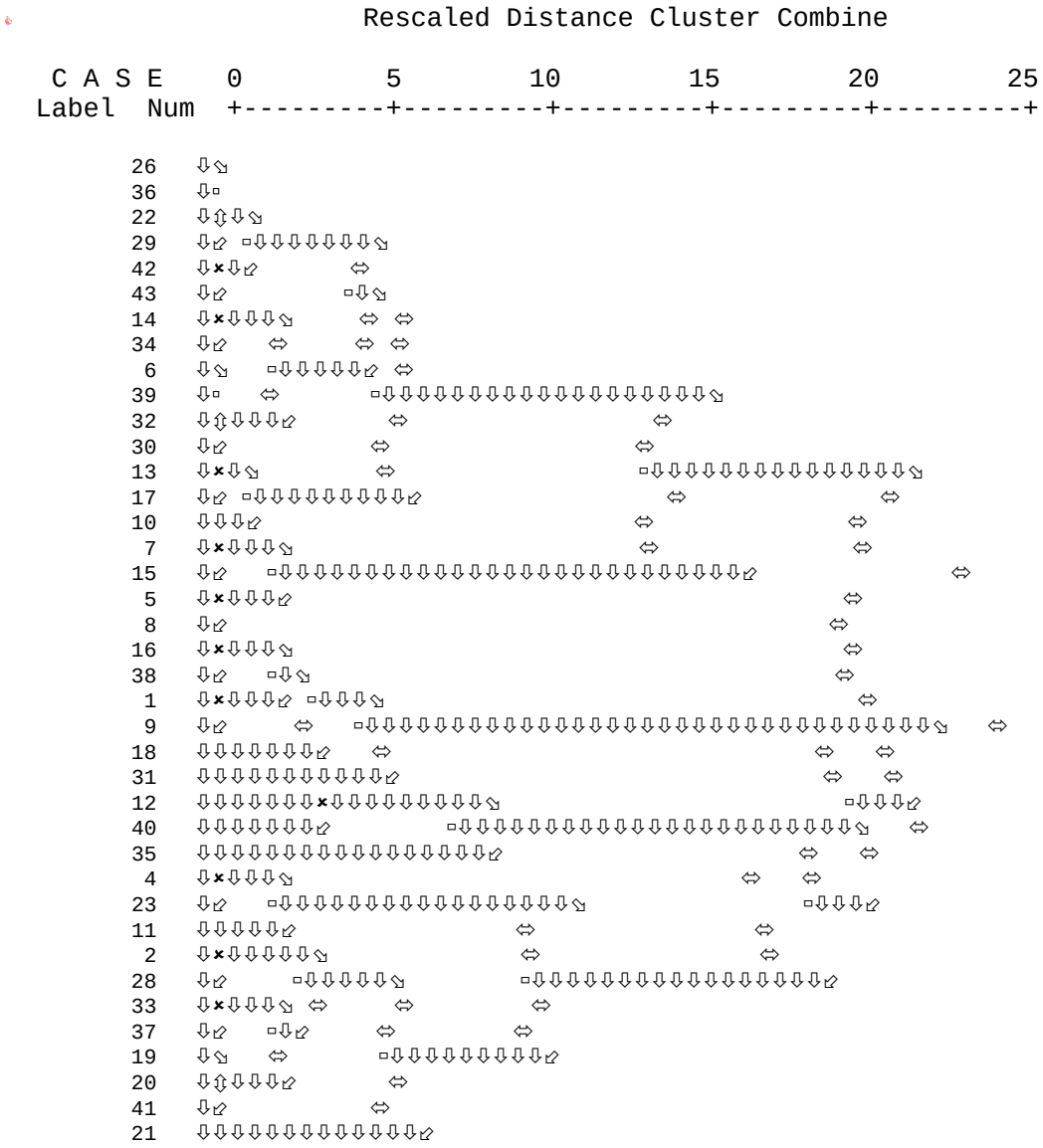


Figure 2a: dendrogram: average linkage method; cluster variates: maths, power, fallibility, positive, history

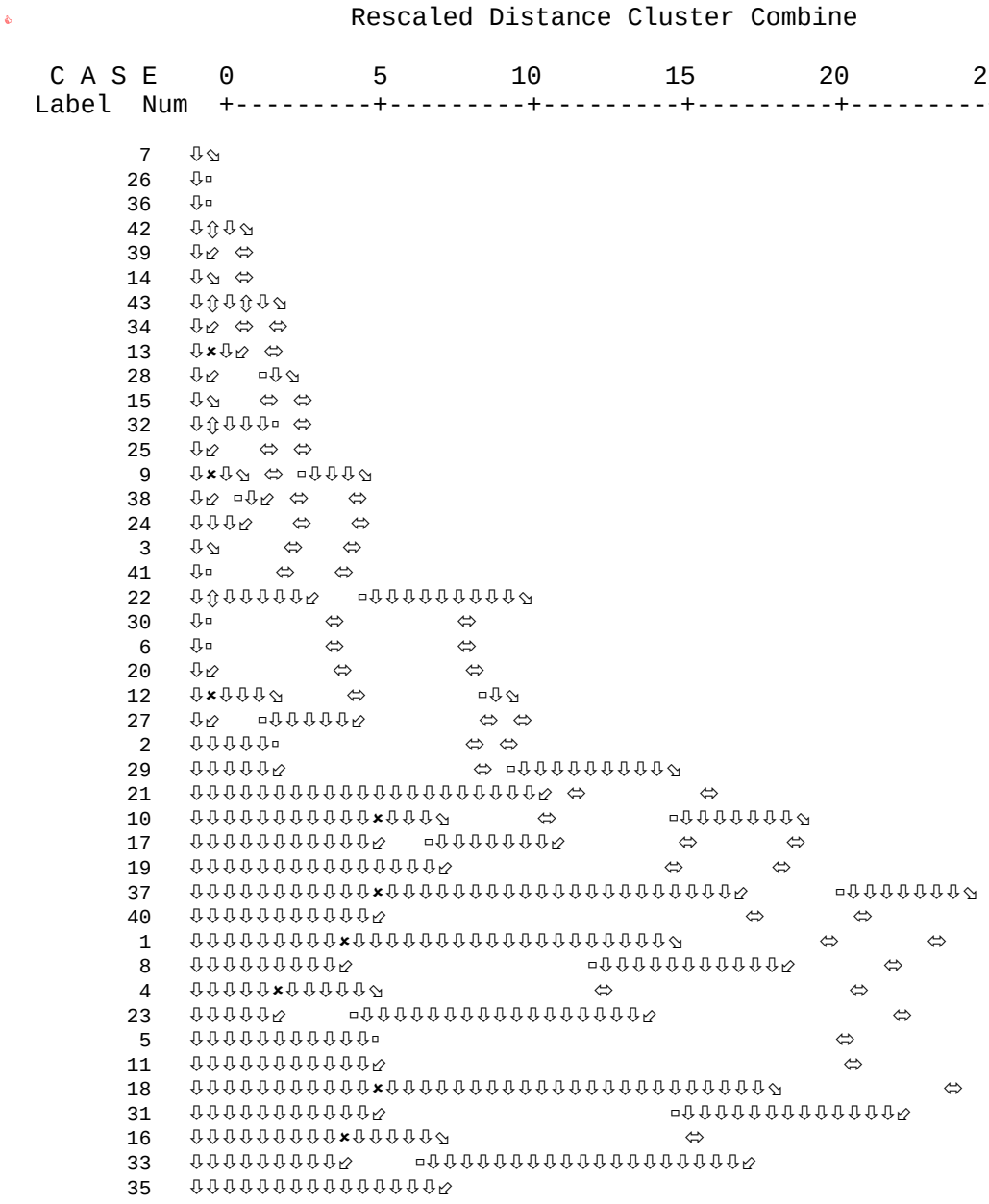


Figure 2b: dendrogram: Ward's method; cluster variates: maths, power, fallibility, positive, history

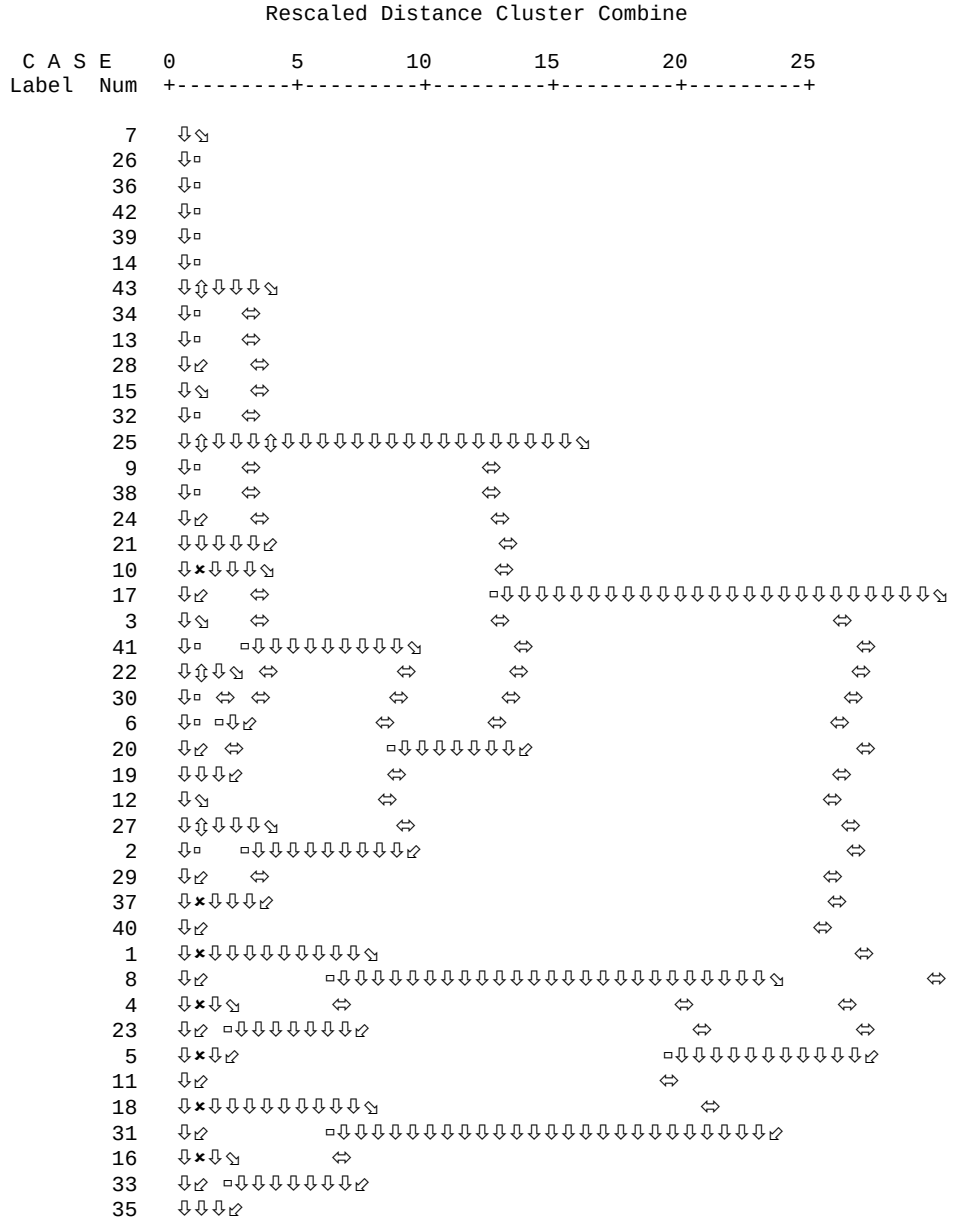


Figure 3a: Dendrogram: average linkage method; cluster variates: maths, history, scarcity, fallibility, gender

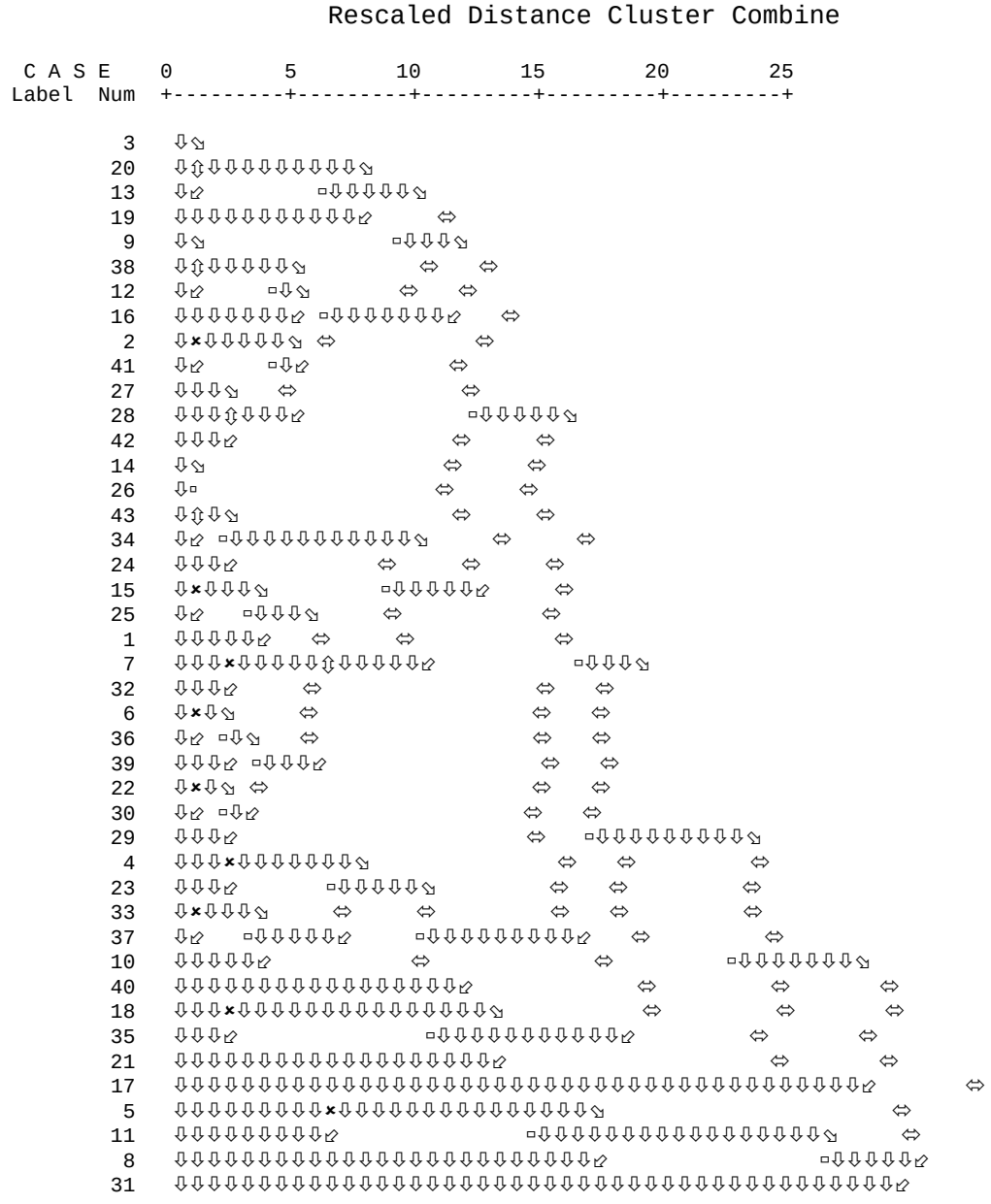
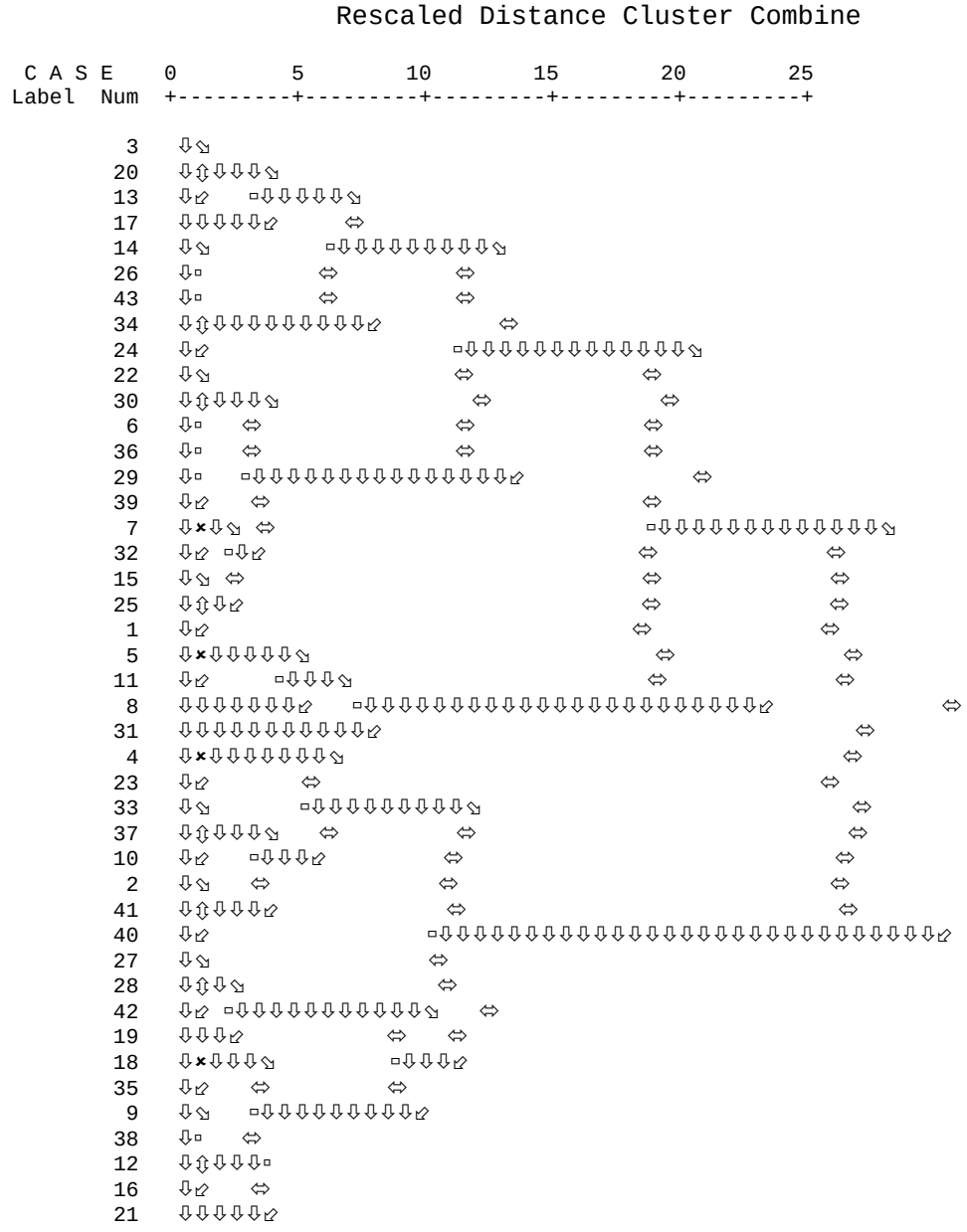


Figure 3b: Dendrogram: Ward's method; cluster variates: maths, history, scarcity, fallibility, gender



Appendix: Questionnaire tool

WHAT ARE THE CORE ECONOMIC PRECEPTS?

This survey is being conducted by Andrew Mearman (Bristol Business School, UWE). It is an investigation into the concepts and methods which economists regard as core. **Please indicate on the sliding scale between 0 and 10 the extent to which you agree with the statement (0 = completely disagree, 10 = agree completely).** All responses will be treated anonymously. The questionnaire should not take more than 5 minutes to complete. **Thank you for your time**.

	Disagree	Agree
Example: Elephants are grey	0	x 10
1. I consider myself a 'mainstream' economist	0	10
2. I consider myself a 'heterodox' economist	0	10
3. I consider myself a 'pluralist' economist	0	10
4. Economic agents are rational (usually maximisers)	0	10
5. Economic systems tend towards equilibrium	0	10
6. Class is an essential factor in understanding economic outcomes	0	10
7. Economics is a positive science	0	10
8. Economics should explicitly take into account natural systems	0	10
9. Economic outcomes are inherently (non-probabilistically) uncertain	0	10
10. All economic theories, methods and approaches are fallible: a variety is needed	0	10
11. Power is an essential factor in understanding economic outcomes	0	10
12. Labour inputs are an essential determinant of the value of a product	0	10
13. Economics is the study of scarcity and choice	0	10
14. Gender is an essential factor in understanding economic outcomes	0	10
15. Economic enquiry requires the use of mathematical methods	0	10
16. Economics is primarily concerned with individuals	0	10
17. Markets are generally the best way to ensure that wants and needs are met efficiently	0	10
18. Money is a determinant of real economic activity	0	10
19. In understanding economics, history and time are of crucial importance	0	10

20. Which journal would you consider the 'best' in which you could attempt to publish? (please state) _____

21. What is your age? ____

22. What is your sex? ____

23. What is your institution? _____

All responses will be treated anonymously.

Thank you for taking your time to complete this questionnaire.