



**Figure 13.4** Barycentric correspondence analysis of democratic breakdown: Causes and cases.

paths to breakdown' identified by Ragin have a natural representation as oppositions in Figure 13.4.

Estonia is an exception. It has a high breakdown score (of 0.88) but is orthogonal to the line shown in Figure 13.3 and appears in the lower-right quadrant. Like the countries at the upper right, Estonia is a strong member of causal configuration *dui*. However, like Germany and Austria, it has high literacy. Finland is very close to Estonia. If I had binarized 'breakdown' to include one additional country, Finland (with a breakdown score of 0.36) would have been the one added.

Figure 13.4 contains no insight that is not already present in Ragin's analysis (in press). It does, however, embed some of that insight within a somewhat wider tableau of cases and configurations; for example, clearly distinguishing the Netherlands, the UK, and

Belgium (all DULIn) from the countries that did exhibit high breakdown. Figure 13.4 does not provide a means for 'discovering' sufficiency – indeed, the dependent variable was not even included in the data (Table 13.5) on which CA was performed – but it does add insight to a visualization of sufficiency, within a reduced-form map of the dual relation of causes and cases.<sup>2</sup>

### DISCUSSION: EXPLOITING THE DUALITY OF CASES AND VARIABLES

Ragin's work, and that of a broader community of researchers (see, for example, the work collected in Ragin and Becker, 1992), develops a case-oriented approach to causal reasoning, one that requires 'a constant iterative engagement with social reality in a programme founded on integrative method'

(Byrne 2002, p. 156). I have sought to build on and extend the idea that variables are constituted by the cases that comprise them, as well as vice versa. The principal machinery for such building has been barycentric correspondence analysis, a form of analysis that is especially well suited for set-theoretic work and its extensions.

This chapter has not been simply an example of how correspondence analysis (CA), even in its barycentric guise, can be imported to aid in QCA. Rather, in the spirit of the iterative engagement to which David Byrne refers in the quotation in the preceding paragraph, QCA has been used to tailor correspondence analysis. For example, I have introduced to CA the concept of 'dependent variable' from the configurational world of QCA; such a concept most often has no place within CA.<sup>3</sup> Much more fundamentally, Ragin's (in press) reworking of fuzzy-set analysis provides a highly innovative sort of 'input' to CA (see Table 13.5), one that has not heretofore been used with the CA approach.

One issue that is sometimes raised about QCA is that a relatively large number of causal combinations in the solution may all be presented as equally relevant.<sup>4</sup> For example, a QCA study of how courts interpret the law in their rulings in AIDS cases resulted in six simplified configurations for the thirty-six cases considered (Musheno et al. 1991, pp. 766–767). New work on the concept of 'coverage' (Ragin 2006) speaks to this criticism to a considerable extent (see also De Meur et al. in press). My discussion of Figure 13.3 (as well as this chapter's Appendix) suggests that combinations can be ordered with respect to their association with the outcome variable. In addition, and in the spirit of duality that guides this chapter, barycentric CA provides ways to talk about importance of variable combinations by reference to the arrangement of cases in a dual case-variable space. Figures 13.3 and 13.4 provide examples relevant to crisp-set and to fuzzy-set analysis respectively.

Another benefit of the linking of CA and QCA is that the joint approach provides a visual representation of key comparisons.

Thus, the CA representation could be used as a guide for case selection in the iterative process that leads from QCA analysis to the in-depth study of cases found to be interesting in the previous analysis. Comparative case-study research is always preoccupied with finding the 'best' cases to study in an in-depth manner. To take an example: Figure 13.4 shows that the analyst need look at only one case in the DULIn cluster (where Belgium, the UK, and the Netherlands are situated similarly), and only one case in the duliN cluster of Spain, Greece, and Portugal. Figure 13.4 also shows that the analyst needs to pay attention to Estonia versus Finland (as mentioned in my discussion of Example 2), but also to Sweden versus Austria, and perhaps to Germany versus Czechoslovakia. In short, assuming the right causal conditions have been selected, the dimensional portraits of barycentric CA set up a way of seeing one's way to the selection of cases for further in-depth study. This is another benefit of combining features of QCA and CA.

Finally, I would like to call attention to the way that the CA analysis treated highly correlated conditions (SIZE and GROWTH) in Table 13.1. It equated these conditions by (in effect) taking the set-theoretic union of them, equating the two conditions in Figure 13.1. The tendency of QCA is to complicate; as Charles Ragin pointed out in a personal communication, each new causal condition doubles the size of the analytic space formed by these conditions. Ultimately, there must be some redundancy among the selected causal conditions, and CA, as a data reduction technique, exploits that redundancy in a way that the more principled QCA cannot (by design).

At the broadest level, in this chapter I have tried to link the duality that has always been fundamental to Ragin's QCA with similar concepts of co-constitution among levels that have been used in social network analysis, in sociology more generally, and in somewhat-related procedures (such as CA and the analysis of dual lattices). There is much more work to do along these productive lines of research.