MEASURING THE WELFARE STATE –

CONCEPTS, IDEAL TYPES AND FUZZY SETS IN COMPARATIVE STUDIES

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Introduction

Is the glass half-empty? Is it more empty than full? Such questions are often linked to judgements which concern qualitative states and changes in degree and kind. Abound in comparative studies such judgements bring forward issues of how best to conceptualise and measure. In comparative studies of the welfare state they prompt reflections on what constitutes the welfare state, how to operationalise it and how to measure change over time and space.

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Comparative welfare state research has made significant progress in the *theoretical* understanding of the welfare state itself, not least due to a dialogue between qualitatively and quantitatively oriented studies (Amenta, 2003). Since 1990, when Gøsta Esping-Andersen published *Three Worlds of Welfare Capitalism*, a common starting point has been the distinction between different types of welfare state regimes: identifying a liberal, conservative and a social democratic welfare state regime. In short, diversity - the co-existence of similarities and differences - characterises different welfare states.

Comparative research however has made much less progress in the *measurement* of welfare state and welfare state change. A lack of consensus about how to measure either is the main reason why scholars disagree on the direction and magnitude of recent change in social policy, i.e. whether reforms amount to fundamental or marginal change (Clayton and Pontusson, 1998 with Pierson, 1996, or Gilbert, 2002 with Kvist, 1999).

Of course, neglecting issues of measurement is not unique to comparative welfare state research. In a review of macro-level comparative studies, Bollen et al. (1993) found that although researchers acknowledge problems of measurement, they largely ignore their consequences. And yet, because researchers are often unable to apply statistical tests of data validity and reliability because of the small number of countries (the small N-problem), they have a particular need to reflect on and tackle measurement problems in alternative ways. Otherwise, they run the risk of making (false) heroic conclusions on small N (Lieberson, 1991).

Concentrating on the connection between theory and data, a relationship also known as measurement validity (Adcock and Collier 2001), the subsequent discussion could apply to a large number of substantive areas. However I concentrate on problems of measurement in comparative welfare state studies not only for illustrative purposes but also because this is a large area of research which has paid relatively little attention to methodological aspects of this kind, with some notable exceptions, such as Castles (2002), who defends the use of social expenditure as an indicator for measuring welfare state change. The key question is whether measurement meaningfully captures the ideas contained in concepts and ideal types? Although social expenditure is 'widely seen as providing misleading indicators of the nature and extent of welfare state activity', Castles (2002: 618) argues that we should refine the approach as a 'second best solution'.

This chapter offers an alternative approach to measurement and a very different strategy, that of formulating a new way of going about measurement by using fuzzy sets and axioms in fuzzy set theory. The aim is to advance the application of fuzzy set theory as a new method for conceptualisation and measurement (see Ragin, 2000 for a broad introduction to fuzzy set social science). I argue that the fuzzy set approach is particularly useful for assessing diversity and change across a limited set of cases, and that it can overcome some of the problems typically related to measurement validity and precision. In other words, using fuzzy sets help to assess whether the glass is half-full or half-empty, or how, if at all, the welfare state is retrenched or restructured.

Introducing the issue and focusing on key theoretical concepts, the subsequent section concentrates on welfare state diversity (1). The following sections argue that cases and ideal types can be viewed as configurations of concepts (2) and discuss how concepts can be conceived and operationalized as

fuzzy sets (3). Finally the chapter demonstrates how to formally examine concepts and ideal types with fuzzy set theory.

1. Welfare state diversity and social citizenship

One set of burning questions in comparative welfare state research concerns whether the welfare state is undergoing retrenchment or restructuring or whether it is resilient to change (Mishra, 1990; Kvist, 1997; Taylor-Gooby, 2002). Before 1990 it was common to distinguish between residual and institutional welfare states (Titmuss 1958, Wilensky and Lebeaux 1958, Alber 1988), locating real welfare states on a continuum stretching from a residual welfare state at one end of the spectrum to an institutional welfare state at the other (Figure 1).

Figure 1. The dichotomy of residual and institutional welfare states

Residual _____ Institutional

According to the dominant thinking for the last thirty years, cash transfers in the institutional welfare state were typically universal and generous, whereas benefits in the residual welfare states guaranteed a minimum but were targeted and reserved for the deserving poor. Welfare states, therefore, were perceived as moving only in two directions: either expanding to become more institutional, or retrenching and becoming more residual.

Such views regarded historical trajectories of welfare state as initially going through a phase of expansion, eventually reaching a point of maturity (Flora 1987) or turning point leading to

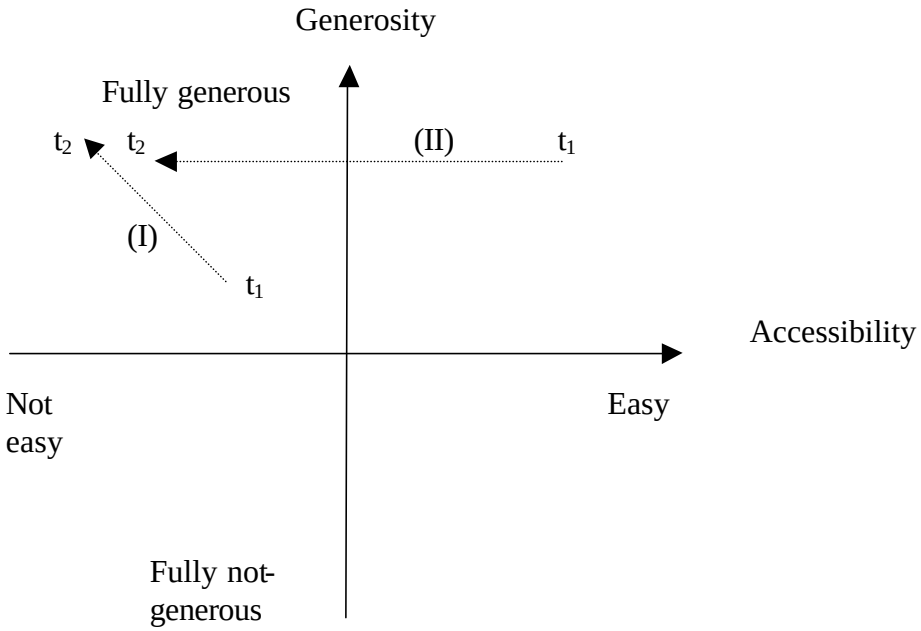
retrenchment (Mishra 1990) from the mid-1980s onwards. Advanced by Esping-Andersen (1990), the idea that welfare states come in three types, and not two, did not alter the notion of welfare states moving either in an institutional or a residual direction. Indeed, Paul Pierson's (1994) influential text on change and politics of the welfare state mainly added a point of no return, i.e. welfare states' resilience to change.

However, since the mid-1990s a growing number of scholars have argued that we are witnessing changes which can not be captured by unilinear, one-dimensional conceptions of more, the same or less welfare state (e.g. Kvist 1997). Revisiting Esping-Andersen's (1990) *Three Worlds of Welfare Capitalism*, researchers pointed out that welfare state ideal types reflect different political ideological notions of social citizenship constituted by social rights and obligations (Marshall 1950) which, in turn, are manifested in specific *configurations* of benefit characteristics, such as generosity and eligibility. To illustrate, the *liberal* welfare state model depicts an ideal type where benefits are meagre and targeted at the needy, positioned in the lower left hand quadrant of Figure 2. While generous, benefits in the *conservative* model are selective, favouring labour market insiders, thus placing its ideal typical position in the upper left hand quadrant. The ideal typical *social democratic* welfare state model can be found in the upper right hand quadrant, granting both universal and generous benefits. Finally, the combination of easily accessible but not generous benefits (lower right hand quadrant – and not caught by Esping-Andersen's trilogy) - is perhaps best described as the Beveridgean, the lib-lab model (Room 1979), or, simply, the *labour* model.

Methodologically, the above describes welfare state diversity on a lower level of abstraction, i.e. that of social rights. With reference to Robert Adcock and David Collier (2001), the welfare state is regarded as a 'background concept' with broad constellations of meanings and understandings

whereas social citizenship is a 'systematized concept' that entails a specific formulation. Depending on specific research interests, systematized concepts other than 'social citizenship' might have been employed to inform the study of the welfare state. Whereas 'social citizenship' (or 'social rights') are theoretical concepts relating to the output, or policy, side of the welfare state, more outcome oriented research might opt for concepts such as 'autonomy' or 'equality', more input oriented studies might make use of concepts such as 'welfare effort' or 'popular support'.

Figure 2. Accessibility and generosity of social rights



The use of social rights as a systematized concept allows for the identification of different combinations of 'less', 'the same' or 'more' of the two constitutive dimensions of social rights, accessibility and generosity. In turn, this facilitates the investigation of multi-dimensional change, or a process described as 'restructuring'. For example, if the generosity of a particular benefit (I)

improves between one point in time (t_1) and another (t_2) while it simultaneously becomes more difficult to access (see Figure 2), it could be argued that that the direction of change is towards a conservative welfare state model. The same may also be true in instances where one dimension remains stable and the other dimension enhances a trait which is characteristic of the conservative welfare state model (see II in Figure 2).

Whether the observed alteration amounts to a qualitative change depends on the start and end points of the benefit trajectory. For example, in Figure 1, benefit I is subject to a change in degree, not in kind or type. Put differently, change here means that I has moved closer to the ideal type of the conservative welfare state model. The closer to the corner, the more the benefit reflects the ideal type. The change within benefit I illustrates a situation where it belongs more strongly to the ideal type of the conservative welfare state regime at t_2 than at t_1. The change, therefore, is quantitative.

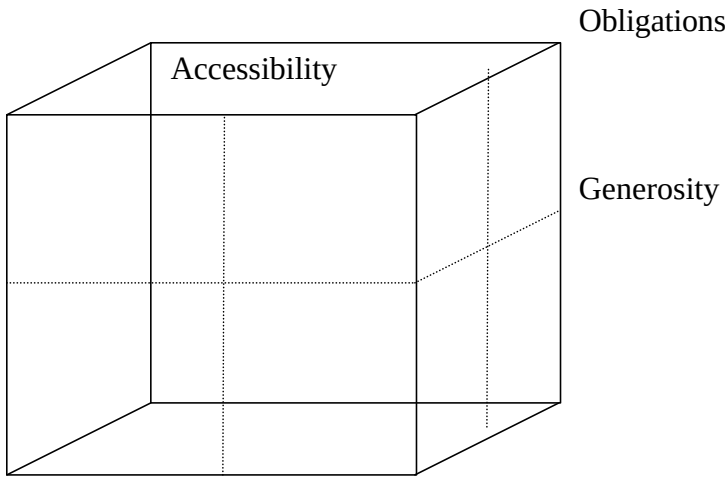
Benefit II is subject to both quantitative and qualitative change. The quantitative change implies that benefit II becoming much less accessible. Moreover, as Figure 2 shows, benefit II is in the upper right-hand quadrant at t_1 and in the upper left-hand quadrant at t_2. This shifting of corners reflects a qualitative change. The example demonstrates how benefit II moves from belonging to a social democratic welfare state model to belonging to that of a conservative welfare state model.

Starting points also matters for the assessment of change. Although the change in benefit II may be argued to be stronger and of a more qualitative nature than the change in benefit I, Figure 2 still shows that benefit I, rather than benefit II, is closer to the ideal typical corner that symbolises the Conservative welfare state model.

2. Configurations of concepts

Social citizenship is constituted of both rights and obligations, and so far we have only set out two dimensions of the rights. Looking only at rights and neglecting obligations is in line with most conventional analyses of social citizenship as exemplified by the Social Citizenship Indicator Project (SCIP) at SOFI, Stockholm University, a database which has information on coverage and generosity, but none on obligations. Twenty years ago, researchers and politicians might have been able to justify this neglect in theory and political practice. This is no longer the case. With the general shift in welfare policies towards more active, employment-centred objectives, there has been an increasing emphasis on individual obligations, both prior to and during the receipt of benefits.

Figure 3. Analytical property space for social citizenship



In Figure 3, a third dimension, obligations, has thus been added to the core analytical concept here. The further a benefit is situated towards the back of this cube, the stronger the attached obligations

and vice versa. As a consequence of adding obligations as a third dimension, four new ideal types emerge which may be labelled 'new' in contrast to the original four 'old' ideal types. For example, the 'old social democratic' welfare state regime is located in the upper front right-hand quadrant, while the 'new social democratic ' welfare state regime, with a stronger emphasis on individual obligations, is closer to the upper back right-hand corner.

In a Weberian sense the corners of the cube constitute eight ideal types and thus as yardsticks, measuring how close or distant given empirical phenomena are to these ideal types and to each other (Weber, 1904; Kvist, 1999). In the analysis here, the relevant measurement is the extent to which national welfare states conform to the various ideal typical welfare state regimes, and to what extent national welfare states are moving closer to each other, so-called 'convergence', or away from each other, 'divergence'.

Another way of illustrating the diversity and analytical constructs applied here is the use of a truth table, displaying the combinations which are possible (Lazarsfeld, 1937). Table 1 shows this method for models of social citizenship, arising from simple yes-or-no dichotomies:

Table 1. Truth table of social citizenship

Model	Accessibility	Generosity	Obligations
New Social democratic	+	+	+
Old Social democratic	+	+	-
New Labour	+	-	+
Old Labour	+	-	-
New Conservative	-	+	+
Old Conservative	-	+	-
New Liberal	-	-	+
Old Liberal	-	-	-

Alternatively, a simple eight-cell table might be used (see table 2) which, as Becker (1998) emphasised, has the advantage that the researcher can add a fourth variable by inserting the value in each cell. From the vantage point of concepts and ideal type analysis however, the eight-cell table shares with truth tables the disadvantage of requiring aspects to be dichotomies.

Table 2. Eight-cell table of social citizenship

	Accessible		Not accessible	
	Generous	Not generous	Generous	Not generous
Obligations				
No obligations				

Here the interest is in substantive issues which are insufficiently captured by dichotomies, such as 'yes' or 'no'. Such an approach does not allow the assessment of changes, both small and large, in relation to one another and to some analytical constructs. But how can the conformity of cases to ideal types, and to each other, be constructed and measured? The remainder of this chapter discusses the ways in which fuzzy set theory may provide innovative and powerful answers to this question.

3. Constructing fuzzy sets on concepts

Fuzzy sets are not fuzzy in the sense of being imprecise or ambiguous. On the contrary, fuzzy sets should be designed to accurately reflect theoretical concepts and analytical constructs which have precise meaning to those researchers using them.

Fuzzy sets provide a way of operationalizing a concept into the 0-to-1 metric, from being 'fully out' to 'fully in' a set. This requires drawing a demarcation line between 'A' and 'not-A'. In the analysis here operationalizing implies the construction of sets that reflect accessibility, generosity and

obligations. These, in turn, will - in different configurations - constitute different ideal types of welfare states.

Lines are drawn on the basis of substantive and theoretical knowledge. By having to draw a line or curve reflecting the particular concept under consideration, the researcher centres his or her focus on the concept rather than on the variables themselves. Focusing on the concept moves the analysis closer to the theoretical body that deals with concepts in the first place. A reference to 'generous benefits' is more informative than speaking of 'benefits with a net replacement rate above X percentage'. Moreover using this term also helps to minimise measurement bias, that is, the gap between theory and reality.

While 'fully generous' and 'fully not-generous' equal extremes, many intermediary concepts link these two categories. Depending on the substance of the concept and the raw material, various fuzzy category intervals may be used (see Ragin, 2000). Here a nine-value fuzzy set is applied, where continuous fuzzy scores between 0 (fully out) and 1 (fully in) indicate partial membership in the following way:

- Scores from 0.83 to 0.99 is almost fully in
- 0.67 to 0.82 is fairly in
- 0.51 to 0.66 is more or less in
- 0.5 is the cross-over point where the case is neither more in nor more out
- 0.33 to 0.49 is more or less out
- 0.17 to 0.32 is fairly out
- 0.01 to 0.16 is almost fully out

Using this nine-value fuzzy set throughout the chapter helps translate interval fuzzy membership scores into verbal concepts or *verbal qualifiers*. For example, if a benefit has a fuzzy score of 0.75 the score is presented as a 'fairly generous' benefit, a fuzzy score of 0.60 translates to a 'more or less generous' benefit.

Constructing fuzzy steps involves two steps: first to establish empirical indicators for the fuzzy set, and second to calibrate the fuzzy set. The following two sections elaborate these steps.

Empirical indicators

To reduce the gap between theory and reality, empirical indicators are needed which reflect the chosen concepts as closely as possible. The quest for useful empirical indicators should be guided by theories and substantive knowledge with reflections made explicit.

Applying the example of social citizenship, three sets have been identified which reflect theoretically important concepts. The first set, accessibility of unemployment benefits, is measured by an index based on scores for the personal scope of application and various eligibility criteria (e.g., work demands, definition of employment records, and membership requirements, if any).

The set for generosity of unemployment benefits is measured by net replacement rates that express the ratio of benefits to former wages after taxation. This measure has become common in the literature. Here the net replacement rate for a single person with previous earnings at the level of the Average Production Worker (APW) has been used. This has two main caveats: first, net replacement rates calculated at other points in the income interval may provide other expressions of

generosity. Second, the existence of tax allowances and/or supplements for children may cause differences in net replacement rates of persons in single individual households and non-single households. Aggregate measures such as average net replacement rates for different income and family situations do not indicate how national system work for any particular population group but simply conflate otherwise useful information. As most national unemployment insurance schemes are strongly individualised, and as unemployment is concentrated among groups with lower levels of education, the net replacement rate for a single APW as empirical indicator for benefit generosity seems justified here.

The third set on obligations of unemployment benefit claimants can be measured in numerous ways. Here an index of negative sanctions, as stipulated in legal texts has been applied. In other words, the measurement reflects negative sanctions that may be imposed if a person becomes unemployed voluntarily or because of misconduct, and on benefit claimants who refuse to accept a job offer or participation in an active labour market programme. Acknowledging that the implementation of sanctions may not always follow the letter of the law, legal stipulations give at least an important signal to both administrative authorities and claimants, and can therefore be seen as reflecting politicians' positions on the issue of obligations.

Calibration of sets

Having identified the best possible empirical evidence, how does the data reflect theoretical concepts. In practical terms, the best approach is, first, to establish when something is fully in and fully out of the set and, second, to fine-tune the set by describing how it looks in the range from fully out to fully in. This calibration of sets must be informed by theoretical and substantive

knowledge since it affects the measurement of fuzzy membership scores. No fuzzy set analysis is better than its sets, making the infusion of knowledge into sets indispensable.

The starting point for the accessibility index here is the assumption that people aged between 18 and the official retirement age should be able to qualify for unemployment benefits after six months of employment within a 12 month period, taking into account activities other than ordinary paid work which might count towards eligibility, e.g. training and child caring. If qualification is possible under these conditions, the benefit system is deemed to be more easy than difficult to access (i.e. the membership score is greater than 0.5). If these conditions are insufficient for benefit qualification, the system is difficult to access (i.e. membership scores lower than 0.5). Table 3 shows the translation of raw data - index scores - into fuzzy membership scores and labels. The higher the index score, the easier the access to benefits.

For the set on generosity, the first qualitative breakpoint occurs when the benefit is fully not-generous. Below this point variation is meaningless since distinguishing between degrees to which benefits exceed 'fully not-generous' does not make sense. The second qualitative breakpoint occurs when the benefit is fully generous. Above this point variation is meaningless because distinguishing between degrees to which exceed 'fully generous' does not make sense. The third qualitative breakpoint is the cross-over point, where the benefit switches from being 'more not-generous than generous' to becoming 'more generous than not-generous'.

According to national consumption surveys (Hansen, 1998) persons cannot maintain any attained standards of living if their income was reduced by four-fifths, they would soon have to rearrange their financial affairs dramatically. Hence, if the net replacement rate is below 20%, we deem it

fully not-generous. Having a job or participating in an active labour market policy programme involves costs for mobility and various other expenses. In most countries - for example, Denmark - workers have tax allowances to partially cover such costs and participants in active labour market policy programmes may earn something extra before having their benefits reduced. Both the earnings disregard and the tax allowances amount to approximately 10% of the APW earnings in the Danish example. For this reason we label net replacement rates of 90% and more as fully generous. Establishing when benefits are more generous than not is more difficult, we have put the point at 55.5%. For the specific translation of net replacement rates into fuzzy scores and labels, see table 3.

Table 3. Specification of empirical indicators and the translation of raw data into fuzzy membership scores and verbal labels

ACCESSIBILITY	GENEROSITY	OBLIGATIONS	Fuzzy membership scores	Verbal labels
>90.0	=90.0	>85.0	1	Fully in the set
82.0-90.0	79.3-89.9	69.5-85.0	0.84-0.99	Almost fully in the set
72.0-81.9	67.7-79.2	54.9-69.4	0.68-0.83	Fairly in the set
60.0-71.9	55.6-67.6	41.3-54.8	0.51-0.67	More or less in the set
59.0-59.9	54.5-55.5	40.2-41.2	0.50	Cross-over point
47.0-58.9	42.4-54.4	27.6-40.1	0.34-0.49	More or less out of the set
37.0-46.9	30.8-42.3	16.0-27.5	0.18-0.33	Fairly out of the set
28.9-36.9	20.1-30.7	5.4-15.9	0.01-0.17	Almost fully out of the set
<28.9	=20.0	<5.4	0	Fully out of the set

Notes: ACCESSIBILITY to unemployment benefits is measured by an index taking into account personal scope of application, age groups and eligibility criteria. GENEROSITY of unemployment benefits is measured by net replacement rates for single person with earnings at level of APW (%). OBLIGATIONS of claimants is measured by an index of negative sanctions imposed on claimants refusing to accept job and ALMP offers.

The final fuzzy set on obligations concerns the severity of negative sanctions, measured by an empirical indicator of the number of weeks claimants may have their benefits suspended and the timing thereof. The earlier the strict sanctions are imposed, the higher the score. The longer - and thus more severe - the sanctions, the higher the index score.

Table 3 also shows the translation of fuzzy membership scores into nine verbal labels, ranging from 'fully accessible' to 'fully not accessible'. These labels are used for the analysis of the conformity of cases to concepts and ideal types. For example, if a benefit scores 70.2 in the set on generosity this translates as a 'fairly generous' benefit.

Scoring cases

How can fuzzy sets be constructed? Basically, there are two options. The first is to separately investigate each dimension of the policy development; the second to use formal set theory axioms to study configurations of sets. This section gives a brief example of the first option applied to empirical developments in Denmark. The subsequent section illustrates the potential of applying the second option.

In 1990, Danish unemployment insurance benefits were almost fully accessible (see table 4). By 1998, the benefits had become only more or less accessible, because the required work period preceding unemployment increased from 26 to 52 weeks. Benefit generosity fell in the same period from fairly generous to more or less generous (see table 4). This drop did not result from any direct cuts in benefit levels or in the benefit formulae but came about for two reasons: benefit indexation lagged behind wage developments and the introduction of a gross tax (a so-called 'labour market contribution') of 5 percent in 1994, increased to 8 percent in 1997.

Table 4. Fuzzy membership scores for Danish unemployment insurance benefits in ACCESSIBILITY, GENEROSITY AND OBLIGATIONS, 1990-1998.

	1990	1995	1998
ACCESSIBILITY	.98	.74	.53
GENEROSITY	.71	.63	.60
OBLIGATIONS	.22	.73	.94

However obligations have seen the most dramatic degree of change. During the 1990s demands on wage and geographical and occupational mobility on the part of unemployed benefit claimants became stronger, accompanied by tougher negative sanctions for the rejection of jobs or training offers. While obligations were fairly lax in 1990, they became nearly almost fully strong by 1998 (see table 4). In other words, the marked development of obligations also led to a qualitative change from lax to strong obligations.

In the 1980s benefits were easy to access in Denmark, with hardly any strings attached, leading some Danish observers at the time to describe the unemployment benefit system as a citizen wage (Langager, 1997). This description is no longer accurate. The tightening of eligibility criteria and the strengthening of obligations means that there is 'no free lunch' when it comes to claiming unemployment insurance benefits.

Configuration of fuzzy sets into ideal types

Esping-Andersen's (1990) welfare state typology lives up to Weber's definition of an ideal type as 'formed by the one-sided accentuation of one or more points of view and by the synthesis of a great many diffuse, more or less present and occasionally absent concrete individual phenomena, which are arranged according to those one-sidedly emphasized viewpoints into a unified analytical construct' (Weber, 1904: 147).

Here, fuzzy set theory is used for the study of ideal types. Although fuzzy sets and ideal types may be seen as opposites, they are not. Fuzzy set theory can be applied to the configurational view of crucial aspects and concepts combining in ideal types (see Ragin, 2000, Kvist, 2006). Logical

operations in fuzzy-set theory allow the construction and measurement of alternative types in formal and precise manners.

Basically, operations with fuzzy sets are generalisations of operations on crisp sets (see Zadeh, 1965; Ragin 2000). Suppose case *x* has a membership value v^a in fuzzy set A for ACCESSIBILITY, a membership value v^g in fuzzy set GENEROSITY, and a membership value v^o in fuzzy set O for OBLIGATIONS.

In the presentation of the analytical property space (Becker, 1998; Lazarsfeld, 1937), the New Social democratic model of social citizenship in relation to unemployed people can be expressed in fuzzy-set terms as the ideal typical location - ACCESSIBLE*GENEROUS*OBLIGATIONS - or, in plain English, as a model characterised by easily accessible, generous benefits with strong obligations imposed on claimants.

Fuzzy set theory contains formal rules for dealing with set theoretic relationships like this one. In this case, we can make use of the *intersection rule*. The value of *x* in A*G*O is the minimum value of v^a, v^g, and v^o. This operation represents logical AND, denoted *, and is called the *minimum principle* in fuzzy set theory.

Applying the minimum principle to the membership scores in table 4 suggests that the minimum value for Denmark in 1990 was 0.22. Put differently, due to lax obligation requirements Denmark was fairly out of the new social democratic model in the early 1990s. As obligations were strengthened markedly in 1994, Denmark changed to belonging 'more or less' (0.63) to the new social democratic model by 1995. Due to tighter eligibility criteria making access to benefits more

difficult in 1996, Denmark was barely a member of the new social democratic model in 1998.

Of course, cases' membership in other models can be studied too. The old social democratic welfare state model, for example, comprised of easily accessible and generous benefits that were not subject to strong obligations. Here the *complement rule* can be applied, i.e. that the value of *x* in ~A is $1-v^a$, where ~ is not. This operation finds the complement to A, and is called *principle of negation* in fuzzy set theory. The value of *x* in A*G*~O is the minimum value of v^a, v^g, and $1-v^o$.

Again looking at the scores in table 4 suggests that Denmark operated a fairly old social democratic welfare state model, i.e. equal to a score of 0.71, in 1990. However, eight years later it is almost fully out, with a score of only 0.06. Behind this fundamental change in the Danish model lies a labour market reform with a series of subsequent modifications, exacerbating certain traits (such as increased obligations) uncommon to the old social democratic model. Combining tougher obligations with stricter accessibility (see table 4), moved the Danish case into the boundary regions of the new conservative (0.47) and social democratic welfare state models (0.53).

Finally, let us accept, for the moment, Esping-Andersen's (1990) argument that there is only one "liberal" model, i.e. that a distinction between Liberal and Labour is not necessary. In this case the *rule of union* can be applied, e.g. the value of *x* in A+G+O is the maximum value of v^a, v^g, and v^o. This operation represents the logical OR, denoted +, and is called the *maximum principle*. Applied to an analysis of the "liberal" model, it means that the value *x* in (~A + A)*~G is given by the maximum of these two expressions. In plain English, it means that the fuzzy membership score of the "liberal" model is the highest score of the model characterised by either not-accessible, not-

generous benefits or by accessible, not-generous benefits. Note that the aspect of obligations is left out entirely.

The view of cases as configurations of aspects introduces the idea that a single difference in an aspect between two cases may constitute a difference in kind - a qualitative distinction. Moreover, the analytical property spaces or truth tables indicate that aspects should not be viewed as independent, separable variables, but rather as elements of configurations (Ragin, 2000). Of course, in principle it remains possible that not all eight feasible combinations have empirical validity or are of theoretical relevance. However, even when some of the ideal types are empirically irrelevant, listing them helps the researcher to get an overview of the subject (see Ragin, 1987; Becker, 1998; and Ragin, 2000 for set theory ways of reducing the property space).

Ideal type analysis

Table 5 sets out fuzzy membership scores for seven countries in the eight possible welfare state ideal types for unemployment insurance. Using these qualitative distinctions, it can be analysed which ideal type a country belongs to and its degree of membership determined. Moreover, statements can be made about which ideal type the country is closest to and furthest away from. This analysis allows nuanced judgments on the (shifting) character of the national welfare states.

Table 5. Fuzzy membership scores for seven European countries in unemployment insurance ideal types, 1990-99

Country	Year	New Social Demo-cratic	Old Social Demo-cratic	New Labour	Old Labour	New Conser-vative	Old Conser-vative	New Liberal	Old Liberal
Denmark	1990	.22	.71	.22	.29	.02	.02	.02	.02
	1995	.63	.27	.37	.27	.26	.26	.26	.26
	1999	.53	.06	.40	.06	.47	.06	.40	.06
Finland	1990	.38	.62	.38	.38	.34	.34	.34	.34

	1995	.38	.62	.38	.38	.29	.29	.29	.29
	1999	.48	.52	.43	.43	.48	.42	.42	.42
Norway	1990	.65	.25	.35	.25	.22	.22	.22	.22
	1995	.65	.25	.35	.25	.22	.22	.22	.22
	1999	.64	.25	.35	.25	.36	.25	.35	.25
Sweden	1990	.22	.78	.04	.04	.08	.08	.04	.04
	1995	.22	.77	.19	.19	.22	.23	.19	.19
	1999	.71	.19	.29	.19	.23	.19	.23	.19
Nether-	1990	.40	.41	.25	.25	.40	.59	.25	.25
lands	1995	.28	.28	.25	.25	.40	.60	.25	.25
	1999	.28	.08	.28	.08	.72	.08	.28	.08
Germany	1990	.45	.34	.42	.34	.55	.34	.42	.34
	1995	.28	.28	.25	.25	.40	.60	.25	.25
	1999	.45	.34	.45	.34	.54	.34	.46	.34
UK	1990	.04	.04	.48	.52	.04	.04	.48	.48
	1995	.03	.03	.48	.52	.03	.03	.48	.48
	1999	.00	.00	.51	.49	.00	.00	.48	.48

Sources: Hansen (various years); NOSOSKO (various years); Kvist (2002).

Table 5 shows that Denmark and Sweden have moved from belonging to an old social democratic unemployment insurance model to belonging to a new social democratic model. Moreover, these were not incremental shifts. Both Sweden and Denmark moved from being fairly out of the new social democratic model to becoming fairly in, and more or less in respectively. Indeed, the greater emphasis on obligations in the two Nordic countries can be interpreted as having brought about a qualitative change in the unemployment insurance model. Furthermore, these two countries were almost fully out of many of the other ideal types during large parts of the 1990s. In other words, their unemployment insurance models are fairly distinct most of the time.

In contrast, Finland presents a more ambiguous case. Throughout the 1990s, Finland belonged to the old social democratic ideal type, although to varying degrees. However, as the scores in table 5 shows, Finland is only more or less out of a number of other models. This can be interpreted as Finland not having an unemployment insurance model which is less distinctive than the ones in the

other two Nordic countries. The fourth Nordic country, Norway, had a fairly strong new social democratic unemployment insurance model during the 1990s. Moreover, Norway was neither close to nor very distant from many other models. In short, the Nordic countries live up to the expectation that they operate social democratic unemployment insurance models. However, with the exception of Finland, by the end of the 1990s they belonged to a version which could be labelled the new social democratic model, stressing strong obligations.

Due to welfare reforms particularly in Denmark and Sweden there has been some convergence toward the new Social democratic model in unemployment insurance across the Nordic countries. However there has been no convergence between the four Nordic and the three non-Nordic countries listed in table 5. Although all seven countries intensified obligations on the part of the unemployed, the result was continued diversity, or what we have described elsewhere as 'parallel trends, persistent diversity' (Kautto and Kvist, 2002). The Netherlands in particular experienced a qualitative change from an old to a *new* conservative welfare state model. In contrast developments in Germany and the UK have been less dramatic. Being a member of the new Conservative model, Germany is not as distinct as the Netherlands, a fact which is underlined by an examination of its membership scores in other models. The scores for the UK indicate a distinctive case, i.e. that the country is fully out of both Social democratic and Conservative models. In fact, the UK is situated in the border region between the Labour and the Liberal model. The UK seems to have stronger affinities across the Atlantic than with the other European countries.

Concluding remarks

The ideal type analysis illustrated two advantages of using fuzzy set theory for measurement purposes. First, fuzzy sets can be constructed in order to reflect the ideas of theoretical concepts,

thereby directly tackling the key concern of achieving measurement validity. Fuzzy set theory demands a high degree of correspondence between concepts and fuzzy membership scores in sets established to reflect such concepts. Researchers must pay great attention to constructing analytical concepts, criteria for establishing qualitative breaking points, and the empirical evidence. Crucial decisions need to be made on the basis of theory, substantive knowledge and the availability and nature of data. In any case, such decisions should be sufficiently explicit to allow for scientific dialogue and replication of the analysis.

Second, it has been demonstrated how axioms in fuzzy set theory allow the interrogation of the analytical property space (i.e. the inside of the cube), and the observation of how cases move around over time. Using comparative welfare state studies for illustrative purposes indicated how concepts such as 'resilience' and 'retrenchment' are inadequate for capturing ongoing welfare reform. Instead, often the latter could be better characterised as 'restructuring' due to simultaneous change in several dimensions. Using fuzzy set theory allows qualified statements on such changes and, in the case of unemployment insurance, the identification of a cross-country process of parallel trends but persistent diversity.

In short, the chapter has aimed to illustrate how advanced fuzzy set theory can be used for measurement purposes. If nothing else, applying the approach requires researchers to be more knowledgeable about theory and cases. In turn, such knowledge may greatly inform discussions of whether the glass is half-empty or whether it is more empty than full.

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