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CONCEPTUALISATION, CONFIGURATION, AND CATEGORISATION – DIVERSITY, IDEAL TYPES AND FUZZY SETS IN COMPARATIVE WELFARE STATE RESEARCH

Jon Kvist
Danish National Institute of Social Research
Herluf Trolles Gade 11
DK-1052 Copenhagen K.
jk@sfi.dk
www.sfi.dk

Abstract This paper advances a new method for studying ideal types, fuzzy-set theory, which is a framework that allows a precise operationalisation of theoretical concepts, the configuration of concepts into analytical constructs, and the categorisation of cases. In a Weberian sense ideal types are analytical constructs used as yardsticks to measure the similarity and difference between concrete phenomena. Ideal type analysis involves differentiation of categories and degrees of membership of such categories. In social science jargon, this means analysis involving the evaluation of qualitative and quantitative differences or, in brief, of diversity. Fuzzy set theory provides a calculus of compatibility. It can measure and compute theoretical concepts and analytical constructs in a manner that is true to their formulation and meaning. This paper sets out elements and principles of fuzzy set theory that are useful for ideal type analysis and presents two illustrative examples of how it can be used in comparative studies. The examples concern changing Nordic welfare policies in the 1990s, unemployment and child family policies, and relate to their conformity to predefined ideal typical models.

The problem of the dependant variable – the welfare state

Assessing diversity is the perhaps biggest challenge facing comparative welfare state research. Issues of key interest concern the extent to which welfare states are similar and different across time and place, that is both quantitative and qualitative differentiation or, in short diversity. Some of the questions in need of answers thus concern whether welfare state reforms amount to qualitative change, that is differences in kind, or quantitative change, that is difference in degree, and whether the outcome of reforms amounts to convergence or divergence across welfare states.

In identifying three distinct ideal types of welfare state regimes, Gøsta Esping-Andersen's *Three Worlds of Welfare States* (1990), became an instant classic. The Liberal, Conservative, and Social Democratic welfare state regimes depicts ideal types for different groups of real welfare states that have undergone distinct political-institutional trajectories, or paths, in their historical development. At the same time, the ideal types also encapsulate distinct political economies with regard to the role of the state vis-à-vis the market and the family. These ideal types have become starting points for most subsequent studies of the causes and consequences of welfare state diversity.

Less consensus exist on the nature and scope of recent welfare reforms, that is change within the last quarter of a century. Early functionalist theorists saw the welfare state as expanding in response to societal change (e.g., Wilensky 1975). Modernists like Peter Flora (1987) argued that the welfare state had grown to its limits. Both neo-liberals (e.g., Kristol 1971, King 1975, Hayek 1994) and neo-marxists (e.g., O'Connor 1973, Gough 1979, Offe 1984), albeit for different reasons, saw the welfare state in a state of crisis that would or should lead to its dismantlement. Later new institutionalists like Paul Pierson (1994) found that the welfare state was resilient to retrenchment (see also Alber 1988, and, Moran 1988). In common these authors share a one-dimensional view of change as reflecting developments forward, stopping or backward. In rough terms they lack a multi-dimensional view of welfare state change allowing it also to go sideward and in multiple directions at the same time. Only recently have scholars attempted to depict change as taking place within the welfare state ideal types and their trajectories, change that is sometimes labelled restructuring or recalibration (e.g., Kvist 1997, Ferrara and Rhodes 2001, Pierson 2001, Scharpf and Schmidt 2001).

At the heart of this dispute on the nature and extent of recent welfare reform lies the study of the dependant variable, the welfare state. Whereas most scholars tend to share a general, theoretical understanding of the welfare state they differ in how they translate theoretical concepts into empirical indicators, their view of case and in their categorisation of cases. In short they use different methods and operationalisations of the dependant variable.

The goal of this paper is to show how a new method for the social sciences, fuzzy sets, may help researchers to rigorously study diversity and change at the same time. The emphasis is on the construction of sets and ideal types as the very potential of fuzzy set social science stand and falls with the quality of this part of the work in the analysis. No fancy set theoretic

operations can save an analysis with lousy sets, the old saying that researchers should spend about 75% of their time on the dependant variable indeed applies to fuzzy set analysis. The paper demonstrates how researchers can construct good sets, analytical constructs and use the operations in fuzzy set theory to analyse concepts and ideal types and thereby categorise cases by entering a laborious dialogue with evidence and theory. Two examples illustrates how the fuzzy set approach enables fine grained, theoretically informed analysis of diversity.

The paper proceeds as follows. First, we briefly set out the scene of welfare state ideal types and change. Second, we present and discuss the first main element of fuzzy-set analysis, namely the idea that concepts, aspects, or variables can be conceived and operationalized as fuzzy sets. Then we present and discuss the second main element of fuzzy-set analysis, that cases can be seen as configurations of aspects, which we demonstrate by setting up two analytical constructs, or ideal types, for, respectively, social citizenship of unemployment and child family policy models. Third, we look at the categorisation of cases in two illustrative analysis of the conformity of Nordic countries in the 1990s to a number of ideal types. Finally, we discuss the usefulness of the method advanced.

Welfare state and change

The welfare state resembles Pandora's box since the welfare state consists of an interwoven bundle of different policies on taxation, housing, health, education, social affairs and labour market policies, just to mention some main arenas, that in turn is made up by a variety of policy areas and programmes. Against this complex reality generalising statements like proclaiming 'resilience' appear rather bold. It heroically assumes homogeneity of the direction and scope of change across different types of welfare states, across policy areas within given national welfare states, and, even, within different policy areas. For illustrative purposes Table 1 looks at only two hypothetical aspects of the welfare state, namely child family policies and unemployment insurance, and show that 'resilience' makes up only one out of nine possible combinations of less, the same or more of these policies. The other eight quadrants demonstrate situations of 'retrenchment' depicted by the crisis literature and defined by less of one or both policies (quadrants 1, 2 and 4), 'restructuring' with more of one policy and less of the other (3 and 7) or 'expansion' of one or both policies (6, 8 and 9).

Table 1. Assessing change across two aspects

		Aspect 1		
		Less	Same	More
Aspect 2	Less	(1) Retrenchment	(2) Retrenchment	(3) Restructuring
	Same	(4) Retrenchment	(5) Resilience	(6) Expansion
	More	(7) Restructuring	(8) Expansion	(9) Expansion

Table 1 shows that operating with only two aspects of the welfare state considerably complicates the issue of the nature of current welfare state change, and that many studies on retrenchment and resilience are overlooking the other important potential outcomes of restructuring and expansion. It goes without saying that complexities add up when introducing more aspects. In any case, whether one or the other type of change characterise

a given policy, national welfare state, welfare state type, or, ultimately, all welfare states is a question to be addressed in empirical investigations.

Nevertheless, the picture becomes further complicated as Table 1 in fact mimics the crude one-dimensional view of change which, as Pierson rightly argues, is dominant in the literature, i.e. that change is measured along a single continuum stretching from the intact of even expanding welfare state on one end to the seriously eroded or dismantled on the other (Pierson 2001, p. 421). When an aspect, say, the generosity of unemployment insurance, become bigger and better in some regard this is mostly taken to be a case of expansion, and when it become smaller and more restrictive it is seen as retrenchment. Such approaches to the study of welfare state diversity reflect the view of cases when approached by quantitative methods. They excel in making generalisations, but do not provide an informed understanding of specific cases. This is partly because these methods primarily conceive aspects or variables as separable identities when these variables interact meaningfully according to the ideal typical logic (Becker 1998; Mahoney 2003). For example, researchers interested in the social citizenship (Marshall 1950) of unemployed may argue that the generosity of unemployment benefits enters theoretically relevant combinations with the accessibility of such benefits. In this regard they argue that there is a qualitative distinction between social rights consisting of accessible or more selective, generous unemployment benefits. These two combinations are associated with, respectively, the Social Democratic and the Conservative welfare state model whereas the Liberal model is characterised by relatively accessible, but not-generous benefits. Instead of distinguishing between such configurations of variables, quantitative methods typically focus on the variation in variables over time or across cases and thereby highlight the degree of conformity or similarity between cases on the specific variable (King *et al.*, 1994).

This is a simplistic notion of change as mainly involving differences in degree. It runs the risk of ignoring, at least, two important types of changes in kind. The first takes place within given types of welfare states. Welfare states are not static but change over time. For example the Liberal welfare state of today is different from the one prevalent thirty years ago. We may thus want to argue that even incremental changes in degree at some point in time has accumulated to become a change in kind. The second change in kind takes place between welfare states types, i.e. developments mean that the very nature of a given welfare state has changed so that it belongs to another welfare state ideal type than at the onset of the period in question. Both changes in kind follow from Esping-Andersen's (1990) work on the complexities of the political economy of welfare states, welfare state diversity and change cannot be boiled down to a crude dichotomy of more or less on one or more separate dimensions. Welfare state ideal types are sites for configurations of aspects or variables, the latter cannot be examined in isolation.

Therefore the concept of 'path dependency' that is frequently used to note that welfare states develop within given ideal type trajectories by having the same or more of something (e.g. Pierson 1996) must be supplemented not only by concepts like 'path reversal' (less of the same) but, more importantly, also 'path change' (something else instead of the same), if,

in theory, such classificatory concepts are to encompass all possible types of welfare state change. On the backdrop of the historical-institutional trajectories of Esping-Andersens' welfare state ideal types and Piersons' work on feedback mechanisms, it is of little surprise that the concept of path dependency has gained so much currency in contemporary welfare state research. But just as the welfare state ideal types have been accused of providing a static view on welfare state, the path dependency concept may be accused of providing a one-dimensional view on change.

In qualitative studies of the welfare state, configurations of variables or aspects take centre stage. A holistic view of the social world, *in casu* the welfare state, dominates studies using qualitative methods. This allows qualitatively oriented researchers to appreciate how differences in the level or configurations of cases constitute differences in type or kind rather than in degree or level (Yin, 1994). However, appreciating the complexity of the social world comes at a price. For qualitative researchers, the price is a more limited number of cases than in most quantitative studies, and a general weakness in formalising the extent of differences between cases of the same kind. For example, all in-depth studies in comparative welfare state research concern little more than a handful of cases (and if more are based on theoretically less relevant aggregate data). In sum, quantitatively variable-oriented research focuses on generality and variation among cases within categories, whereas qualitatively case-oriented research focuses on complexity and categorisation of cases (Ragin, 2000).

To make sense of current welfare state reforms we thus need an approach that allow us to simultaneously access quantitative and qualitative differentation, i.e. the diversity among welfare states and the kind of change they undergo. As argued above, it is paramount that such diachrone and synchrone comparisons be informed by theoretical and substantive knowledge. Indeed, to describe reality and to provide a yardstick to which reality can be compared, Max Weber suggested to construct ideal types informed by theory and substantive knowledge. The ideal type, according to Weber, is "formed by the one-sided accentuation of one or more points of view and by the synthesis of a great many diffuse, discrete, 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 1949, p. 90).

Weber argued that classificatory concepts derived direct from the empirical reality are per definition fraught by the 'infinite flux' of the latter, only ideal types provide exact knowledge (ibid). Moreover, the purpose of the ideal type is to provide a means of comparison with concrete reality in order to revel the significance of that reality, not to present the world as a true or historical reality. Ideal types can thus be seen as implicit theories that help researchers to see if, and to what extent, real empirical phenomena conform to their prior assumptions.

In a Weberian sense, ideal types can be understood in broad terms as social science concepts or even as what Weber called historical models. To construct Weberian ideal types, the

researcher must informed by theory and substantive knowledge synthesise the features or aspects of facts and their interconnectedness which fit the particular problem under investigation.

What we need to study ideal types, however, is an approach that combines the concerns of these qualitative and the quantitative research foci, that is the simultaneous study of categories and membership of such categories. Thus, we need a method that enables the study of quantitative and qualitative differentiation at the same time - what is also known as diversity. Fortunately, the outline of a diversity-oriented approach is emerging, namely the application of fuzzy-set theory to social science research (see Ragin 2000).

Here we will demonstrate how this new method can be used to study ideal types by first sketching out the main elements and basic operations in fuzzy-set theory, and, second, by applying it in a simple illustrative example of comparative social policy analysis. It will show that fuzzy-set theory allows for the simultaneous study of differences in kind and in degree, i.e. diversity. Because of these inherent features it is particularly well-suited to study conformity to ideal types as it can assess both to which ideal type a particular part of the real world belongs as well as the degree to which it belongs to this ideal type. Fuzzy-set theory was originally conceived by Lotfi Zadeh in 1965, and its application to the social sciences is advanced by Charles Ragin (Zadeh 1965, Ragin 2000). Here we will not deal with fuzzy-set causal analysis, but merely concentrate on what could be called 'fuzzy-set ideal type analysis'. At the core of fuzzy-set social science is a perception of cases as configurations of aspects so that a difference in one aspect may constitute a difference in kind and not just in degree. At the same time, the fuzzy-set approach allows partial membership of a case in a given configuration. Consequently, using the fuzzy-set approach allows us to study differences in both kind and degree at the same time. Among other things, this makes it possible to evaluate cases relative to their membership of specified ideal types.

The evidence concerns the Scandinavian welfare states in the policy areas of unemployment insurance and child family policies in the 1990s. This is close to perfect data for this ideal type analysis. Theoretically, the existence of a 'Nordic welfare model' was solidified by Esping-Andersen's Social Democratic regime and the Nordic countries is the most distinctive of all country groups (Castles 1993, but see Baldwin 1990). Of relevance for the two policy areas, the model is characterised by a universal and generous income transfer system, local and publicly funded social services to cater for all needs and the whole population (Erikson et al 1987, Kangas 1994, Korpi and Palme, Kvist 1999, Sipilä 1997). Moreover, these various attributes are thought to interact and reinforce each other, only together do they constitute the whole that we may describe as the Social Democratic model (Esping-Andersen and Korpi 1987, Kvist 1999).

These characteristics commonly result in the Social Democratic regime being portrayed as 'big and fat' compared to the more 'lean and mean' models in Anglo Saxon and Continental European countries. Nordic countries should thus be the most likely candidates for retrenching their welfare state with speed and determination if called for by economic or

political pressures. And indeed, the period and policy areas in question provides near laboratory like settings for an examination of diversity and change due to the very different economic and political experiences of these countries in the period. For example, Denmark and Norway experienced a favourable economic development, especially in the second half of the decade, whereas Sweden and Finland had recession in the first half. Finland and Sweden became members while Norway opted to cooperate within the EEA-agreement. Denmark was the sole member of the EU at the start of the 1990s and the first of these countries to experience a shift from Conservative to Social Democratic led coalition government.

Conceptualisation - Bridging the gap between the world of language and the world of empirical analysis

Perhaps the most salient aspect of fuzzy-set theory is that it allows researchers to bridge the gap between the world of language and the world of empirical analysis. As we saw above, quantitative researchers tend to study variables whereas qualitatively researchers look at aspects of cases and their possible combinations. In contrast, the fuzzy-set approach takes its starting point in concepts. Concepts belong to the world of natural language. In social science theoretical, qualifying, and other abstract and verbal concepts are abundant. Within comparative welfare state research take, for example, a key theoretical concept like 'social citizenship' constituted by 'social rights' and 'social obligations' (Marshall 1950), qualifying concepts like 'universal' and 'generous', and an ideal type like the 'Social Democratic welfare state regime' (Esping-Andersen 1990, 1999) constituted by universal, generous social rights (Korpi and Palme 1998, Kvist 2002). All these theoretical concepts and analytical constructs have precise meaning to the researchers using them.

However, cases have differing degrees of membership in the set of cases with 'social citizenship', 'universality', 'generosity', and 'Social Democratic welfare states', and there are no crisp boundaries between, for example, being a case with generous benefits and a case without. Fuzzy-set theory provides a framework that gives the opportunity to measure verbal concepts in a precise way. Thus, fuzzy-set theory does not mean imprecise or fuzzy measurement nor that concepts are vague or fuzzy in the conventional meaning, but rather that the concepts or phenomena under study can be operationalised as fuzzy sets allowing cases to have graded membership in such sets. Fuzzy-set theory provides a method for dealing with social science concepts. In fact, fuzzy-set theory offers a precise way of analysing theoretical concepts. This first main element of fuzzy-set theory builds on crisp set theory.

The crisp set approach

Crisp set theory underlies much of social science research as, for example, when qualitatively oriented researchers make typologies and quantitatively oriented researchers dichotomise variables. At its heart crisp set theory works as an exclusion mechanism. Either something is in or out of a set. Sets have crisp boundaries defining which cases or elements are in or out of sets. For example in set A, elements which are not members of set A are members of the complement set not-A. This is also called the negation principle, and is

denoted by the set theoretical symbol '~'. The intersection operation represents logical AND, for example, whether case x is in set A AND in set B. In set theory it is denoted by the symbol '*'. The union operation represents logical OR, that is, whether case x is in set A OR B. In set theory it is denoted by the symbol '+'.

Crisp set theory can be seen as a framework for Aristotelian logic. Over 2,000 years ago, Aristotle formulated the law of the excluded middle and the law of non-contradiction. In crisp set theory these laws are formalised:

- The law of the excluded middle. A OR not-A. This law deals with the union of sets, where one takes all the binary unit lists and takes the highest value for the corresponding slots. For example, the two sets (1 0) OR (0 1) equals (1 1).

- The law of non-contradiction. A ≠ not-A. This law deals with the intersection of sets, where one takes all the binary unit lists and takes the smallest value for the corresponding slots. For example, the two sets (1 0) AND (0 1) equals the empty set (0 0).

But how does the crisp set approach deal with theoretical concepts? We can illustrate this with an example. Imagine the situation of unemployed. How do we determine whether their social rights are strong or weak, good or bad? It boils down to the classic problem in social science of where to draw the line.

A common research strategy to help set the line is to make use of averages or medians, and let cases be categorised accordingly. Benefit with payment levels above the median or average are then typically portrayed as strong social rights and those with payment levels below as weak social rights. However, this translation of mathematical language into formal language is problematic in a number of ways. First, it portrays the world as black and white when in reality the world is mostly shades of grey. Benefits, for example, are rarely fully generous or fully not-generous, but somewhere in between. Second, the practical procedure of rounding off raises a series of problems in itself. This can be illustrated by looking at the effect of applying crisp logic to the generosity of benefits. In Figure 1A below, the line has been drawn at 75% of previous earnings. However, this rounding off conflicts with our intuitive understanding of the given situation. Why should a benefit at 74% be deemed not-generous and a benefit of 75% generous? As pointed out by Weber (1949), Lakoff (1987) and many others, the practice of applying mathematical logic in social science derives from the natural sciences, but can and should not be applied in the social sciences. Averages are sample specific, theoretical concepts and ideal types are not.

FIGURE 1A and 1B about here

Related to the problem of where to draw the line is the problem of evaluating change and identifying qualitative breakpoints. If, for example, a benefit equals 100% of previous earnings, most would agree that this is a truly generous benefit. If we deduct 1% income

compensation, most would still regard this as an incremental change and the benefit would still be judged to be generous. However, how many times can we deduct 1%, before the benefit can no longer be seen as generous? Clearly, when the income compensation moves towards zero, it becomes absurd to call it a generous benefit. For this reason, it seems fruitful to operate with shades of grey, in this case with differing degrees of benefit generosity.

A particularly troubling case of the conventional rounding off to A or not-A, to generous or not-generous, arises in situations of meaningful ambiguity. A well-known example is that of judging whether the glass is half-full or half-empty. In this situation one stage or category involves the other; a benefit that is half generous suggests that it is at the same time half not-generous[1]. Or, in the language of set theory, sometimes A = not-A.

The fuzzy set approach

In practice, fuzzy theory works by drawing a curve between opposites, between A and not-A, between generous and not-generous. Information, substantive knowledge and theories help us to draw this curve. Fuzzy sets can take all possible shapes (linear, S-function, Bell-curve, etc), where the specific shape should resemble the given concept as closely as possible. So the creation of a fuzzy set is a process of operationalising a concept – vague or not – into the 0 to 1 metric, from being fully out to fully in the set.

By having to draw a curve reflecting the particular concept under consideration, the focus of the researcher becomes centred on the concept rather than the variables themselves. In fact, this moves the analysis closer to the theoretical body that deals with concepts in the first place (Ragin, 2000). It is more informative to talk of 'generous countries' than 'countries with a net replacement rate above X percentage'. This does not mean, however, that variables should be left behind, but rather that they should be transformed to fuzzy sets. For example, replacement rates can be transformed to a fuzzy set on generosity. This involves setting a number of qualitative breakpoints to help the translation of raw data, or replacement rates, to fuzzy sets. The first qualitative breakpoint is when the benefit is fully not-generous, below which variation is meaningless as it does not make sense to distinguish between the degree that benefits exceed fully not-generous benefits. The second qualitative breakpoint is when the benefit is fully generous, above which variation is meaningless as it does not make sense to distinguish between the degree that benefits exceed fully generous benefits. The third qualitative breakpoint is the cross-over point, where the benefit goes from being more not-generous than generous to become more generous than not-generous[2], see the three qualitative breakpoints in Figure 1B.

Figure 1B shows the fuzzy sets for the ideas of generous and not-generous benefits. It can be seen that the boundary between generous and not-generous is not only imprecise, but it is also not unique. As a benefit increases, it enters a world where it has properties of both generosity and not-generosity at the same time. A benefit that is not fully generous is also somewhat not-generous. The shaded area indicates this world where a benefit belongs to

both the generous and not-generous regions. This violates the Aristotelian Law of non-contradiction.

Identifying empirical indicators and qualitative breaking points

Fuzzy set theory demands a high degree of correspondence between concepts and fuzzy membership scores in sets established to reflect such concepts. Therefore it is essential that great attention is paid to the analytical construction of the concepts, the criteria for establishing qualitative breaking points, and the empirical evidence. These crucial decisions should be made on the basis of theories, substantive knowledge, and the availability and nature of data. In any case, the decisions made should be explicit to allow for scientific dialogue and replication of the analysis.

Let us illustrate this in our two examples that both comes out of the literature on social citizenship. Social rights are often portrayed as epitomising the realisation of full citizenship, the triumph of modern societies (Marshall 1950). Today it is largely uncontested that social rights constitute the cornerstone of the welfare state (Esping-Andersen 1990, Barbalet 1988). Citizenship is 'a status bestowed on those who are full members of a community. All who possess the status are equal with respect to the rights and duties with which the status is endowed' (Marshall 1950, p. 84), and social rights refer to 'the whole range from the right to a modicum of economic welfare and security to the right to share to the full in the social heritage and to live the life of a civilized being according to the standards prevailing in the society' (ibid: 72). Marshall is less clear about the obligations, duties and responsibilities associated with social rights besides that citizens should pay taxes, do military service, and live the lives of gentlemen. But obligations are not only vague expressions of duties, but are backed by laws and state's enforcement of such laws, just like social rights (Janoski 1998, p. 66ff).

In the analysis on unemployment insurance models we use three sets for concepts related to the accessibility of unemployment insurance benefits, the generosity of unemployment insurance benefits, and, finally, the obligations of unemployment insurance claimants. In the analysis of child family policies we use three sets for concepts related to the generosity of child allowances, and the universality and quality of child care. Box 1 contains a more detailed reasoning behind the identification of the empirical indicators, criteria for qualitative breaking points, and procedures for translation of raw data into fuzzy membership values

Box 1. Fuzzy sets for unemployment insurance

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 work, and membership requirements, if any). Two observations should be kept in mind when using such an index of accessibility to unemployment insurance benefits. First, unemployment insurance is only but one scheme that may provide cash transfers to people out of work. Other schemes like social assistance, early exit benefits, and sickness and disability benefits all provide benefits to people who are not employed. Ideally, one would want to study the whole system of possible schemes and their accessibility features simultaneously, but this is not possible in one chapter. Second, per definition unemployment insurance cannot be universal as

it would then be a citizen wage. Thus, no country has 'fully' universal unemployment insurance schemes. Instead one may talk of the degree to which such benefits are accessible (see also Clasen *et al.* 2000). The starting point for our index is that people between 18 and official retirement age should be able to qualify for benefits within 12 months by six months of work, taking into account what activities counts towards eligibility besides ordinary work (e.g., training, child caring, and so forth). If qualification is possible under these conditions, the scheme is seen as being more easy than difficult to access (i.e. membership score greater than .5). When this is not the possible, the scheme is difficult to access (i.e. membership scores lower than .5). The translation of raw data, index scores, into fuzzy membership scores and verbal labels can be seen in Table 2 below.

Generosity of unemployment benefits is measured by net replacement rates that express the ratio of benefits compared to former wages after taxation. This measure of generosity has become commonly accepted in the literature (see, for example, Esping-Andersen 1990, Martin, 1996, Carroll 1999, Salomäki & Munzi 1999). Again we look only at unemployment insurance. This makes the measure less representative of the empirical reality when unemployment compensation consists of other elements than the tax system and unemployment insurance. We use the net replacement rate for a single person with previous earnings at the level of the Average Production Worker (APW). This measure has two main caveats. First, net replacement rates calculated at other points in the income interval may give other expressions of generosity. Denmark has the least stable profile for net replacement rates which in 1999 for a person earning 75% of the APW is 79%, 61% for the APW and 46% for 150% of the APW. In Sweden the similar net replacement rates are 81%, 69.5% and 50% and in Finland 62%, 59%, and 49% whereas the Norwegian is stable at around 65%. Second, the net replacement rates may differ between persons in single individual households and non-single households due to the existence of tax allowances and/or supplements for children. In short, the problem in both cases is how to find an appropriate measure for a country's social protection system when, in fact, this system work very differently for different socio-economic groups (Kvist 1998). Aggregate measures like an average net replacement rate for different income and family situations (see, for example, Scarpetta 1996) does not give an indication of how the national system works for any one population group, but simply conflates otherwise useful information. As most national unemployment insurance schemes are strongly individualised and as unemployment are concentrated among groups with shorter education, if any (OECD 2000a), we stick with the net replacement rate for a single APW as our empirical indicator for benefit generosity. The next issue is how to establish qualitative breaking points for when a benefit is fully generous, fully not-generous and more generous than not. According to national consumption surveys persons cannot maintain any attained standards of living if they got their income reduced to a fifth, they would soon have to rearrange their financial affairs dramatically (e.g., Hansen 1998). Hence, if the net replacement rate is below 20% we deem it to be fully not-generous. Having a job or participating in a ALMP placement involves costs for mobility and various other types of expenses. In most countries, for example, Denmark workers have tax allowances to cover partially for such costs and ALMP participants may earn something extra before their benefit is 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 deem net replacement rates of 90% and more to be fully generous. It is more difficult to establish when benefits are more generous than not, we have put the point at 55.5%. For the specific translation of net replacement rates into fuzzy scores and verbal labels see Table 2.

Obligations of unemployment claimants can be measured in numerous ways, but it is immensely difficult to derive at a good index of strictness of sanctions (see Kvist 1998, Ministry of Finance 1998, OECD 2000b). We have decided to opt for a measure on negative sanctions as they are stipulated in legal texts. That is, an index that measure the negative sanctions that may be imposed if a person becomes unemployed voluntarily or because of fault,

and, when claiming benefits, refuse to accept a job or ALMP offer first, second and subsequently times. Recognizing that implementation may not always follow the letter of the law, legal stipulations do give an important signal to both administrative authorities and claimants, and can be seen as a reflection of politicians' stance on the issue of obligations. Hence, our fuzzy set concerns the severity of negative sanctions measured by an empirical indicator on the number of number of weeks claimants may have their benefits suspended. The logic behind the index is that the earlier strict sanctions are imposed, the higher score. For example, a temporary sanction period for the first refusal weighs twice as much as for a similar period imposed for a second refusal, which, in turn weighs twice as much as sanction periods for subsequent refusals. Also the longer, and thus more severe, the sanctions, the higher index score. For this reason scores for permanent exclusion have been set equal to a 26 weeks period of sanction, and, again, the weight is twice as big for exclusion at the first refusal as for exclusion at the second refusal etc. Where countries apply different rules for refusal of job and ALMP offers, respectively, the average of these two scores have been used as the index score. Similarly, an average is found when countries make use of different rules for refusals depending on timing in benefit spell (e.g., Denmark) or discretion to decide between temporary or permanent benefit cut-offs (e.g., Finland and Sweden). In the latter case, the average takes into account the actual use of the permanent withdrawal informed by national statistics and experts. Finally, consideration has been made to the normal timing of offers in the benefit period; the earlier offers, and hence potential sanctions are imposed, the higher index scores.

The other example concerns child family policies. Again we can use the framework of social citizenship to theoretically pinpoint concepts of relevance. Here the literature has identified the generosity of child family allowances as a hallmark within child family policy since it reflects the public-private division of the economic costs of raising children. Universality of child care reflect on the similar division of care responsibilities and hence also the autonomy of traditional care givers, most notably women in families (e.g., Orloff 1993). Finally, the quality of child care is identified to inform about the priority giving to children and their later life chances (e.g., Esping-Andersen 2002). A more detailed reasoning behind the empirical indicators and their translation into fuzzy set membership scores is set out in Box 2.

Box 2. Fuzzy sets on child family policies

Generosity of child family allowances is assessed according to their impact on the net disposable income on families. From three stylised family types (with different number and age of children) we find the average increase in disposable income per child caused by child family allowances. Based on substantive knowledge from national studies of household budgets we have established qualitative breaking points for when benefits can be judged to cover or more the costs associated with raising children (e.g. CASA 1993, and, Hansen 1998). If child family allowances makes the disposable income to increase with more than six percentage, this country is seen as being fully in the set of countries wit generous child family allowances. Since increases of less than 1.4 percentage is judged to be trivial in relation to the costs of having children such countries are therefore fully out the set.

Universality of child care is measured by the share of children in child care. Since the policy aim is not to place all children at all times in child care we cannot use an interval scale from 0 to 100 %. Instead we introduce a qualitative breaking point at 80% coverage above which countries are seen as having fully universal child care. The relative high cut-of point takes account of the relative high employment rate of Nordic women and grandmothers that has traditionally cared of children (Leira 1992). The qualitative breaking point at the other end is

set at 20% coverage. Data concerns coverage in publicly supported child care facilities like kindergartens and day care, independently of whether there are in the public or private sector. Informal child care which is of considerable scope in some countries is not included as the ideal type concerns the welfare *state*. A number of other schemes may biase our measure on universality of child care. Leave schemes for maternity, father and parents granted for children below three years of age invalidate any measure of coverage. Children above five years of age mostly goes to schools or in preschool schemes. For these reasons we focus on the situation of children between three and six years of age (alternatively pre-school age if this is lower than six years of age).

Quality of child care is measured by child:staff ratios which has been identified in american clinical studies as of importance for children's welfare, cognitive development and later life chances, including social mobility (Howes 1997, Peisner-Feinberg and Burchinal 1997). Other relevant empirical indicators like the education of carers was not possible to establish due to limited comparative reliable information. With regard to the calibration of child:staff ratios to fuzzy membership scores, this must take into account the age of the children and other characteristica. Based on Brazelton' studies average child:staff ratios for three to six years olds should be less than three three children per staff to be a sign of high quality, the upper qualitative breaking point, less than six children is sign of good quality (cross-over point), and more than nine children is a sign of fully bad quality (the lower qualitative breaking point) (Brazelton 1992). On the basis of these qualitative distinctions from conventional empirical studies we have established a fuzzy set on quality in child care where Table 3 below contains the translation of raw data into fuzzy membership scores and verbal labels.

Box 1 and 2 not only specifies the empirical indicators, but also the reasoning behind their calibration, i.e. the identification of qualitative breaking points. This leads straight to the formal impositioning of verbal qualifiers that can be applied using neighbouring concepts.

Neighbouring concepts and verbal qualifiers

Indedd, a very helpful feature of fuzzy-set theory is that it allows for neighbouring concepts to be linked via subsets. Whereas fully generous and fully not-generous each equal an extreme, there are many intermediary concepts which link these two categories. Depending on substance of the concept and raw material various fuzzy category intervals may be used (see Ragin, 2000). Here we use a nine value fuzzy set where continuous fuzzy scores between 0 (fully out) and 1 (fully in) indicate partial membership in the following way:

- Scores between 0.83 and 0.99 indicate that the case is almost fully in the set of, for example, 'generous' countries;
- 0.67 to 0.82 indicate 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; and
- 0.01 to 0.16 is almost fully out.

This nine value fuzzy set is used throughout the paper to help us to translate interval fuzzy membership scores into verbal concepts or *verbal qualifiers*. For example, if a benefit gets a

fuzzy score of 0.75 this is translated into the verbal concept 'fairly generous' and a fuzzy score of 0.60 translates to 'more or less generous'. This illustrates the 'second translation' in fuzzy-set theory. As described above, the first translation concerns translating a theoretical concept to a line connecting two opposites. After measurement and computation, the result is then translated back into natural language for presentational purposes - the second translation.

Tables 2 and 3 specify, respectively, the empirical indicators for the social citizenship of unemployed and of child family policies. Note how the setting qualitative anchors as well as other translation of raw data into fuzzy membership scores is guided by the substantive and theoretical knowledge detailed in Box 1 and 2 above.

Table 2. Specification of empirical indicators for unemployment insurance and the translation of data into fuzzy membership scores and verbal label

Empirical indicators:			Translation of data into:	
Accessibility to unemployment benefits measured by an index taking into account personal scope of application, age groups and eligibility criteria	Generosity of unemployment benefits measured by net replacement rate for single person with earnings at level of APW (%)	Obligations of claimants measured by an index of the negative sanctions imposed if claimants refuse to accept job and ALMP offers	Fuzzy membership scores	Verbal label
>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

Table 2 above gives examples of how both quantitative (net replacement rates) and qualitative raw data (via index on accessibility and obligation) can be translated into fuzzy scores. Table 3 below contains more examples of the translation of numerical empirical indicators into fuzzy membership scores.

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

Empirical indicators:			Translation of raw data into:	
Generosity measured by the average increase in disposable net	Universality measured by the share of children	Quality measured by the child:staff ratio in child care	Fuzzy membership scores	Verbal labels

income caused by Child family allowances (%)	between 3 and six years of age in child care (%)			
≥6.00	>80	<3.00	1	Fully in the set
5.20-5.99	71-80	3.00-3.99	0.84-0.99	Almost fully in the set
4.40-5.19	61-70	4.00-4.99	0.68-0.83	Fairly in the set
3.60-4.39	51-60	5.00-5.99	0.51-0.67	More or less in the set
3.50-3.59	50	6.00	0.50	Cross-over point
2.80-3.49	40-49	6.01-7.00	0.34-0.49	More or less out of the set
2.10-2.79	30-39	7.01-8.00	0.18-0.33	Fairly out of the set
1.40-2.09	20-29	8.01-8.99	0.01-0.17	Almost fully out of the set
<1.40	<20	≥9.00	0	Fully out of the set

Table 2 and 3 also show how fuzzy membership scores are translated into nine verbal labels, ranging from, for example 'fully accessible' to 'fully not accessible'. These labels are used throughout the remainder of the paper. For example, if a benefit scores 70.2 in the set on generosity this is translated into and presented as a 'fairly generous' benefit.

After having established empirical indicators and procedures of translating raw data into fuzzy scores and verbal labels, we may now proceed to the operations on fuzzy sets. That is, we can now set out how fuzzy sets on concepts can be configures in various ways to construct ideal types.

Operations on fuzzy sets

In short, fuzzy-set theory can be said to provide a calculus of compatibility that can be applied in ideal type analysis (but for causal analysis, see Ragin, 2000). Figure 2 shows the operations on fuzzy sets that are particularly useful in studying ideal types, i.e. complement, union and intersection.

FIGURE 2 about here

Operations on fuzzy sets are generalisations of operations on crisp sets (see Zadeh, 1965; Ragin, 2000). Suppose case x has membership value v^a in fuzzy set A, membership value v^b in fuzzy set B, and membership value v^c in fuzzy set C:

- Complement. The value of x in ~A is $1-v^a$. This operation finds the complement to A, and is called *principle of negation* in fuzzy set theory.

- Intersection. The value of x in A*B*C is the minimum value of v^a, v^b, and v^c. This operation represents logical AND, and is called the *minimum principle* in fuzzy set theory.

- Union. The value of x in A+B+C is the maximum value of of v^a, v^b, and v^c. This operation represents logical OR, and is called the *maximum principle*.

The complement operation is particularly helpful when looking only at one aspect of a case, e.g. the generosity and non-generosity of a case, whereas the intersection and union operations are useful when analysing analytical constructs such as ideal types that consist of specific configurations of aspects. And this is exactly what we will turn to now.

Configuration - Ideal types and cases as configurations of aspects

The second main element of fuzzy-set theory that we will touch upon here concerns its configurational or holistic view (Ragin 2000). In short it implies that cases are seen as configurations of aspects (or sets) so that a difference in one aspect may constitute a difference in kind and not just in degree. The configurational view of cases is salient within qualitative case-oriented research where different aspects of a case are understood in relation to each other and to the whole they form. In contrast, conventional quantitative variable-oriented research is alien to understanding a case's variables in relation to each other. Instead variable-oriented research tends to look for variation among variables across cases (for an example on benefit generosity, see Scarpetta 1996). Variables are thus seen as independent of each other, and when they are not, researchers often find themselves busy trying to control for interaction effects among variables. However, in fuzzy-set ideal type analysis it is the very combination of variables, or aspects, that forms the analytical construct, the ideal type.

The analytical property space

Building on Marshall scholars, especially Walter Korpi and Gøsta Esping-Andersen, have advanced the view that the type and strength of social rights lies at the core of the welfare state proper. Social rights are typically conceived as different combinations of the universality and generosity of benefits (for studies building on the SCIP database, see, for example, Palme 1990 for old age pensions, Kangas 1991 for sickness benefits and Carrol 1999 for unemployment benefits). Theoretically, social rights within the Social Democratic model follows from the egalitarian principle that people ought to be equal in some respect. The state actively attempts to undo market-induced differentials or hereditary privilege. The goal of the state is to damper inequalities in living conditions between families and persons with and without jobs, between men and women, between skilled and less-skilled, and to secure employment for all. To achieve these lofty goals, the state take on an active role by not only providing easy accessible, generous unemployment benefits, but also intervene more broadly in the economy for example by offering unemployed activation offers that aims on the one hand to demotivate ablebodied from taking up benefits and, on the other hand to increase the human capital of claimants so they can (re-)enter the labour market.

The state thus also expects, and perhaps increasingly so, that citizens contribute to the common good to the extent possible for them. For this reason, we introduce a third aspect in the empirical analysis, obligations, since these constitute the other side of the coin in social citizenship, see the discussion earlier. (Theoretically, it may even be relevant to discuss whether the established notion of social citizenship should be supplemented by a concept of active citizenship as the former is so heavily associated with rights only). For unemployed

this means that they are asked to be willing, seeking and able to take on work or participate in activation offers and that they will be penalised in cases of non-compliance. (The trend towards increasing obligations is not exclusive to the Social Democratic model, but because of differing contexts, the implications are different for social citizenship).

The introduction of an new dimension to the property space shows how not only the number of potential ideal types doubles, but more importantly how it furthers the understanding of even pre-existing ideal types. In adding new dimensions, one should carefully consider their theoretical relevance and empirical meaning. For example, some may argue that the long duration of unemployment benefit periods in the Nordic countries should be seen as an important part of the social rights of unemployed, but empirical indicators on the formal rules on benefit duration are, however, in large part invalidated in the presence of strict obligations that result in fictitious maximum benefit periods. Hence, insights from one dimension run against adding yet a dimension on rights.

In sum, we thus conclude by having identified a total of three aspects (or variables, or sets) that are essential for understanding the social citizenship of unemployed. These are the access to and generosity of unemployment insurance and the associated obligations on claimants. In principle, these three aspects can be combined in 2^3, or eight, ways, which present the analytical property space (Lazarsfeld 1937, Becker 1998, Ragin 2000), see Table 4. Each row symbolise the different combinations of rights and obligations, or, in other words, the possible ideal types made of the three selected aspects.

Table 4. Models of unemployment insurance

Accessibility to Benefits (A)	Generosity of benefits (G)	Obligations to accept job or ALMP offers (O)	Model
A (easy)	G (high)	O (strong)	A*G*O (New Social Democratic)
A (easy)	G (high)	~O (weak)	A*G*~O (Old Social Democratic)
A (easy)	~G (low)	O (strong)	A*~G*O (New Labour)
A (easy)	~G (low)	~O (weak)	A*~G*~O (Old Labour)
~A (difficult)	G (high)	O (strong)	~A*G*O (New Conservative)
~A (difficult)	G (high)	~O (weak)	~A*G*~O (Old Conservative)
~A (difficult)	~G (low)	O (strong)	~A*~G*O (New Liberal)
~A (difficult)	~G (low)	~O (weak)	~A*~G*~O (Old Liberal)

In the framework of Korpi and others, the Social Democratic model resembles the combination of universal and generous benefits. But by introducing yet another dimension, the aspect of obligations, we suddenly have two versions of the Social Democratic model, that we for the sake of simplicity label the New and Old Social Democratic model. These are contained in, respectively, row 1 and 2 of the analytical property space in Table 4. This table also contains models of less expected relevance for the Nordic countries which are fleshed out in more detail in Kvist (2001) (for other models of unemployment models, see also Gallie and Paugam 2000, and, Clasen *et al.* 2001). In this presentation of the analytical property space the New Social Democratic model of social citizenship of unemployed can be expressed in fuzzy-set terms as the ideal typical location:

ACCESSIBLE*GENEROUS*OBLIGATIONS, or, in plain English, as the model characterised by easy accessible, generous benefits with strong obligations on claimants.

We also found three aspects of relevance for child family policy models. Their possible eight combinations are set out in the analytical property space in Table 5. The first two aspects, generosity and universality, are perhaps the least contested as they echo the work on social rights quoted above. The third aspect, quality of child care, is not new in a theoretical sense, but is rarely included in empirical analysis. At the same time, the distinction between high and low quality which are associated with, respectively, new and old version of the various models, e.g., New versus Old Social Democratic Model, aims to catch the increased attention paid to the importance of early, high quality interventions to secure children' welfare and later life chances. That is at least what comes out of much recent empirical work and in much political rhetoric. Whether practice follows from knowledge and back words is another question, as we will see in the analysis below.

Table 5. The analytical property space for child family policy models

Generosity of child allowances	Universality of child care	Quality of child care	Child family policy model
G (high)	U (encompassing)	Q (high)	G*U*Q (New Social Democratic model)
G (high)	U (encompassing)	~Q (low)	G*U*~Q (Old Social Democratic model)
G (high)	~U (limited)	Q (high)	G*~U*Q (New Conservative model)
G (high)	~U (limited)	~Q (low)	G*~U*~Q (Old Conservative model)
~G (low)	U (encompassing)	Q (high)	~G*U*Q (New Labour model)
~G (low)	U (encompassing)	~Q (low)	~G*U*~Q (Old Labour model)
~G (low)	~U (limited)	Q (high)	~G*~U*Q (New Liberal Model)
~G (low)	~U (limited)	~Q (low)	~G*~U*~Q (Old Liberal model)

In Table 5 the New Social Democratic Child family policy model can be expressed in fuzzy-set terms as the ideal typical location: GENEROUS*UNIVERSAL*QUALITY, or as the combination of generous child family allowances with universal child care of good quality.

In general, this view of cases as configurations of aspects implements 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 show that aspects should not be seen as independent, separable variables, but rather as elements of configurations (Ragin 2000). Even though the aspects are not taken out of the blue, it may be that not all eight possible combinations have empirical instances or are of theoretical relevance. When some of the ideal types may lack empirical cases or be irrelevant, their listing still help the researcher to get an overview of the subject matter (see Ragin 1987, Becker 1998, and, Ragin 2000 for set theoretical ways to reduce the property space).

Categorisation – Studying cases' proximity to ideal types

Graphically, the eight possible models can be said to constitute corners in a cube: each corner represents an ideal typical locations in the analytical space. The configurational view of cases within fuzzy-set theory has in this way allowed us to make a typology of possible ideal types. They are the analytical constructs formed by the possible combinations of the

identified relevant aspects of cases; the corners of the cube. In reality, however, not all corners or ideal types will find empirical instances as the social world is characterised by limited diversity (Ragin 1987). Also, very rarely will a given concrete phenomenon be placed in a corner - a perfect match to the ideal type. Instead cases will be situated somewhere inside the cube.

By combining fuzzy sets with the configurational view of cases, fuzzy-set theory gives us the opportunity to interrogate the inside of the cube, to find out which corner, or ideal type, a case belongs to as well as its degree of membership of the various possible combinations. Quantitative change is when a case's membership of an ideal type changes over time - the degree of membership change. Qualitative change is when a case shifts from having membership of one ideal type to another. This happens when the membership score shifts over the cross-over point for one or more of the constitutive aspects. This is why the cross-over points are considered one of the qualitative breakpoint anchors. At the same time is has to be kept in mind that a qualitative change only occurs to the extent that the cross-over points have true substantive meaning. In our example, if a case goes from 0.51 to 0.49 on accessibility of benefits this is a trivial change in so far as it has moved from being the weakest possible member of one type to become the weakest possible member of another, a mere shift within the region of great ambiguity. In other examples, where the cross-over point has greater substantive significance than in the example of accessibility, however, such a shift could amount to real qualitative change.

After having identified our analytical constructs and their constitutive aspects, the next step is to transform these aspects into fuzzy sets, and then apply the operations of fuzzy-set theory to determine the locations of cases outside the corners, but inside the cube. In the previous section we constructed the fuzzy sets, so we can move on the analysis where the next two sections provide examples on the development in, respectively, unemployment insurance and child family policies based on our empirical evidence.

Unemployment insurance models

Table 6 below sets out countries' fuzzy membership scores in the eight models of unemployment insurance. Scores in bold indicate countries' membership of a model (i.e. fuzzy membership score greater than .5), scores in bold and italics indicate more or less membership (i.e. membership score between .34 and .49), and scores in italics indicate fully and almost fully out of the model (i.e. scores between .00 and .17). Using these qualitative distinctions we can analyse not only which model a country belongs to and its degree of membership, but also which models the country is closest to and furthest away from. This enables us to make judgments on the (shifting) character of the national unemployment insurance model.

Table 6. Fuzzy membership scores in unemployment insurance models, 1990-1998.

Country	Model	'90	'91	'92	'93	'94	'95	'96	'97	'98
Denmark	New Social Democratic (A*G*O)	.22	.22	.22	.22	**.65**	**.63**	**.62**	**.53**	**.53**
	Old Social Democratic (A*G*~O)	**.71**	**.71**	**.69**	**.69**	.27	.27	.26	*.11*	*.06*
	New Labour (A*~G*O)	.22	.22	.22	.22	***.35***	***.37***	***.38***	***.39***	.40

	Old Labour (A*~G*~O)	.29	.29	.31	.31	.27	.27	*.16*	*.11*	*.06*
	New Conservative (~A*G*O)	*.02*	*.02*	*.02*	*.02*	.26	.26	***.35***	***.47***	***.47***
	Old Conservative (~A*G*~O)	*.02*	*.02*	*.02*	*.02*	.26	.26	*.16*	*.11*	*.06*
	New Liberal (~A*~G*O)	*.02*	*.02*	*.02*	*.02*	.26	.26	***.35***	***.39***	***.40***
	Old Liberal (~A*~G*~O)	*.02*	*.02*	*.02*	*.02*	.26	.26	*.16*	*.11*	*.06*
Finland	New Social Democratic (A*G*O)	***.38***	***.38***	***.38***	***.38***	***.38***	***.38***	***.38***	***.38***	***.48***
	Old Social Democratic (A*G*~O)	**.62**	**.62**	**.51**	**.51**	**.51**	**.62**	**.60**	**.58**	**.52**
	New Labour (A*~G*O)	***.38***	***.38***	***.38***	***.38***	***.38***	***.38***	***.38***	***.38***	***.43***
	Old Labour (A*~G*~O)	***.38***	***.38***	***.38***	***.38***	***.38***	***.38***	***.40***	***.42***	***.43***
	New Conservative (~A*G*O)	***.34***	***.34***	***.38***	***.38***	***.38***	.29	.29	***.38***	***.48***
	Old Conservative (~A*G*~O)	***.34***	***.34***	***.49***	***.49***	***.49***	.29	.29	***.42***	***.42***
	New Liberal (~A*~G*O)	***.34***	***.34***	***.38***	***.38***	***.38***	.29	.29	***.38***	***.42***
	Old Liberal (~A*~G*~O)	***.34***	***.34***	***.38***	***.38***	***.38***	.29	.29	***.42***	***.42***
Norway	New Social Democratic (A*G*O)	**.65**	**.65**	**.65**	**.65**	**.65**	**.65**	**.65**	**.64**	**.64**
	Old Social Democratic (A*G*~O)	.25	.25	.25	.25	.25	.25	.25	.25	.25
	New Labour (A*~G*O)	***.35***	***.35***	***.35***	***.35***	***.35***	***.35***	***.35***	***.35***	***.35***
	Old Labour (A*~G*~O)	.25	.25	.25	.25	.25	.25	.25	.25	.25
	New Conservative (~A*G*O)	.22	.22	.22	.22	.22	.22	.29	***.36***	***.36***
	Old Conservative (~A*G*~O)	.22	.22	.22	.22	.22	.22	.25	.25	.25
	New Liberal (~A*~G*O)	.22	.22	.22	.22	.22	.22	.29	***.35***	***.35***
	Old Liberal (~A*~G*~O)	.22	.22	.22	.22	.22	.22	.25	.25	.25
Sweden	New Social Democratic (A*G*O)	.22	.22	.22	.22	.22	.22	**.74**	**.72**	**.71**
	Old Social Democratic (A*G*~O)	**.78**	**.78**	**.78**	**.78**	**.77**	**.77**	.19	.19	.19
	New Labour (A*~G*O)	*.04*	*.04*	*.05*	*.15*	*.15*	.19	.26	.28	.29
	Old Labour (A*~G*~O)	*.04*	*.04*	*.05*	*.15*	*.15*	.19	.19	.19	.19
	New Conservative (~A*G*O)	*.08*	*.08*	*.08*	*.08*	.22	.22	.23	.23	.23
	Old Conservative (~A*G*~O)	*.08*	*.08*	*.08*	*.08*	.23	.23	.19	.19	.19
	New Liberal (~A*~G*O)	*.04*	*.04*	*.05*	*.08*	*.15*	.19	.23	.23	.23
	Old Liberal (~A*~G*~O)	*.04*	*.04*	*.05*	*.08*	*.15*	.19	.19	.19	.19

From Table 6 we can see countries' membership of the four unemployment insurance models in their old and new versions, respectively with weak and strong obligations. It can be seen, that Denmark and Sweden have moved from belonging to an Old Social Democratic model to belong to a New Social Democratic model. Moreover, these were not incremental shifts in the area of great ambiguity. Both Sweden and Denmark moved from being fairly out of the New Social Democratic model to become fairly in and more or less in, respectively. Indeed the greater emphasis on obligations in the two Nordic countries can be interpreted as resulting in a qualitative change of the unemployment insurance model. Also, as indicated by the Danish and Swedish scores in italics, these two countries are almost fully out of many of the other model during large parts of the 1990s. In other words, their unemployment insurance policies are pretty distinct most of the time.

In contrast, Finland presents a more ambiguous case. Throughout the 1990s, Finland belonged to the Old Social Democratic model, although to varying degree. However, as can be seen from the Finnish scores in bold and italics in Table 6, the country is only more or less out of a number of other models. This can be interpreted as Finland not having as distinct an unemployment insurance model as the other Nordic countries. The last country, Norway, had a fairly strong New Social Democratic unemployment insurance model during the 1990s. And Norway was not close or very distant from many other models. In short, the

Nordic countries live up to the expectation that they should have Social Democratic unemployment insurance models, and with the exception of Finland, at the end of the 1990s they belonged to the version we have earlier called the New Social Democratic model stressing strong obligations.

In sum, the analysis on the development of social citizenship for unemployed in the Nordic countries in the 1990s provides a number of insights. First, access to unemployment insurance has become increasingly difficult in the 1990s in nearly all countries. Although sometimes markedly stricter, no country can be said to have transformed their access criteria fundamentally. Second, all countries, except Norway, have also made benefits less generous. Third, claimants' obligations were increased dramatically in three countries leading to qualitatively changing their national unemployment insurance model. Denmark and Sweden thus made a path change from an Old to a New Social Democratic model. Finland also made obligations stronger, but these changes were more marginal in nature. Norway retained its level of obligations, but these were already comparatively strong at the beginning of the 1990s. Fourth, despite general tendencies to stricter access, reduced generosity, and stronger obligations, country developments remained within the frames depicted by the Social Democratic ideal types. The overall development is characterised by some cross-national commonalities in policy changes across countries, and some convergence between countries having the same underlying ideology in social policy. All national governments are, to varying degrees, actively adapting their unemployment insurance policies, changing the nature of social citizenship, but at the same time governments pay due attention to their ideological and institutional legacies.

Child family policies

It is also possible to go into more nuance in fuzzy set analysis of ideal types. By investigating the development within the various sets constituting the ideal type the researcher may gain valuable information on the nature of change and on its impact on the overall conformity of the case to a given ideal type. Let us illustrate the potential value in this regard in the example of child family policy models. For this purpose Table 7 reports Nordic countries' membership in three fuzzy sets (see Columns 3 to 5) under GENEROSITY, UNIVERSALITY and QUALITY, as well as in the ideal type, the NEW SOCIAL DEMOCRATIC CHILD FAMILY POLICY MODEL (see Column 6).

Table 7. Nordic countries' degree of generosity, universality and quality as well as conformity to the New Social Democratic Family Policy Model, 1990-99.

Country	Year	Generosity of child allowances (G)	Universality of child care (U)	Quality of child care (Q)	New Social Democratic Child family Policy Model (G*U*Q)
Denmark	1990/91	.56	.87	.53	.53
	1992/93	.61	.94	.62	.61
	1994/95	.65	.99	.71	.65
	1996/97	.67	1.00	.71	.67

	1998/99	.68	1.00	.71	.68
Finland	1990/91	-	.63	.51	.51
	1992/93	-	.51	.57	.51
	1994/95	1.00	.58	.63	.58
	1996/97	.88	.78	.63	.63
	1998/99	.79	.81	.63	.63
Norway	1990/91	-	.62	.75	.62
	1992/93	-	.68	.75	.68
	1994/95	-	.68	.75	.68
	1996/97	-	.87	.75	.75
	1998/99	-	.91	.75	.75
Sweden	1990/91	.89	.73	.71	.71
	1992/93	.84	.71	.67	.67
	1994/95	.76	.87	.63	.63
	1996/97	.52	1.00	.63	.52
	1998/99	.67	.97	.63	.63

Sources: Hansen (various years); NOSOSKO (various years).
Notes: Unfortunately no data for generosity in Norway, generosity in Finland 1990-93, and for the quality of child care from 1996 onwards. However, it is unlikely that the conformity of Finland to the Social Democratic model in 1990-1993 is influenced by the lack of data on generosity as its child allowances were very big in the start of the 1990s. Data on the quality of child care for 1996-99 has been set at the level of 1993/94 which is a heroic assumption in the light of marked expansion in child care places which most likely has involved some trade-off with the quality of child care as here measured by the child:staff ratio.

Child care was almost fully universal in 1990, but has since 1996 been fully universal. Central government made the provision of child care a high priority and allocated extra funds for the municipalities who are responsible for providing child care as in the other Nordic countries. Although municipalities responded by expanding the number of places markedly, also in an attempt to attract and retain working child families, the increase of fertility and lower unemployment resulted in increased demand of child care

Although the Finnish child care guarantee for children (below 3 years of age) had existed for longer time her child care was only more or less universal in 1990. In tandem with dramatically increases in unemployment in the following years, the share of children and hence also the universality of child care fell markedly. In part this was because unemployed chose to care for their own children to reduce costs, and in part because municipalities barred children of unemployed to get places. Backed by government reports arguing that the lack of child care was leading to persistent unemployment, policies made a u-turn was in 1996 when the child care guarantee was extended to cover all children below 7 years of age. Combined with an improved economy and higher female employment participation the universality of child care increased markedly to become fairly universal since 1997.

In Sweden the number of children in care increased with no less than 155,000 children from 1990 to 1997 as a result of marked expansion of kindergartens and fewer restrictions on private child care. The degree of universality increased from being fairly universal in 1990 to become fully universal in 1996, but due to cuts in the public sector the went to become almost fully universal. Just like in Finland parent in Sweden has a right to child care if they

work or study, albeit unemployed and employed can become different due to local autonomy.

With the smallest share of 3 to 6 years old in child care Norway had a more or less universal child care in the 1990s. This resonates well with the picture of Norway as being the most traditional of the Nordic countries. Historically Norway has not been through the same shift of children being cared in institutions rather than by mothers and grandmothers that happed in Denmark and Sweden in the 1960s and 1970s. High fertility and increased female labour participation however increased the demand for publicly supported child care. Moreover the lowering of school age to six years of age in 1997 resulted in more vacant places in child care. Improved parental leave and other schemes pushed in the other direction, but mostly for children between 0 and 2 years of age. Towards the end of the decade the first of these opposing trends gets the upper hand which since 1997 has been almost fully universal. In other words, Norway is no longer so traditional in this are of child family policies where it no longer distinguish itself so much from the other Nordic countries.

None of the Nordic countries can be said to have fully high quality of child care when measured by the number of children per staff. Denmark has gone from having more or less high quality in 1990 to have fairly high quality in 1993 as the child:staff ratio falls from 5.8 to 4.7. In the same years the quality deteroriates in Finland marginally from 5 to 5.2. Although Norway only had fairly high quality in child care it was still the Nordic country with the best quality with a child:staff ratio at 4.5 in both 1990 and 1993. Sweden fell in the same period from having fairly high to have more or less high quality. Unfortunately more recent data does not exist, but the expansion of child care coverage has probably compromised the quality of child care which was already unsatisfactory at the start of the period in relation to the demands given by the New Social Democratic Child Family Policy Model.

Even though the 1990s has witnessed considerable changes in the child family policies, not least with regard to the generosity of child family allowances and the universality of child care, it has not resulted in any country being excluded from the New Social Democratic Child Family Policy Model. However, the traditional exponent of the model, Sweden, went from being number 1 to become a marginal member in 1996. Due to subsequent increases in the generosity of child family allowances Sweden has improved its membership, but still it is somewhat away from the situation in 1990. In contrast, Norway demonstrates the largest stability with a gradual improvement from being more or less to become fairly close to the New Social Democratic Child Family Policy Model. Finland was hardly a member of the model in the start of the decade, not least to a lot of cuts in the start following a severe economic crisis. Finland has since recovered more or less and improved parts of family policies and is now fairly close to the model. None of the countries are, however, close to the ideal typical model.

This is not least because of the development in child care. All four countries have made marked expansion in the number of child care places, but the combination of higher fertility,

unemployment and new or improved leave schemes and care schemes has meant that it has not resulted in similar increase in the degree of universality. None the less universality remains the only area where all countries have experienced a increase with Denmark and Finland today having fully universal child care. The price for this expansion of child care is unfortunately most likely to be a deterioration of the quality of schemes. Denmark is the only country with an improved child:staff ratio. All countries can make considerable improvements in the quality of child care before they can be seen as having fully high quality.

In general there is no clear patterns for reforms across countries. Despite significant cuts Finland remains the most generous Nordic country. Denmark and less so Norway…

Discussion

The Weberian ideal type aims, as argued by Ringer (1997), to build a bridge in social science between with the nomothetic, explanatory tradition made up mainly by conventional variable-oriented studies and the interpretative, ideographic tradition made up by conventional case-oriented studies. Ideal type analysis with fuzzy sets does not aspire to set up universal laws as in the nomothetic realm, but rather view the social world, here the welfare state, as holistic. The basic assumption here that the elements of reality interact in meaningful in configurations builds on case-oriented methods and ideographic theories. The on-going dialogue between theory and evidence in the construction of sets, see above, is also a cardinal sin to advocates of the variable-oriented method (King *et al.* 1994, see also the discussion between Ragin 1997 and Goldthorpe 1997). Unlike ideographic theories, however, fuzzy set studies of ideal types insist that reality may be studied formally and mathematically. The potential value of fuzzy set social science is thus that it gives complementary approaches and tools to researchers interested in exploring social diversity and contribute to theory development. Researchers interested in pursuing aims like interpreting the importance of unique, social phenomena may be better served with conventional case-oriented methods or variable-oriented methods if they seek to identify broad patterns, test and refine theories, or to make predictions (see Ragin 1994, 2000).

Within comparative welfare state research a dialogue between qualitative and quantitative oriented studies of the welfare state has advanced the knowledge base considerably compared to many other fields, as argued by Amenta (2003). For example, especially feminist scholars have in case-oriented studies criticised the original welfare state ideal types suggested by Esping-Andersen in 1990 (e.g., Lewis 1992, Orloff 1993, Hobson *et al.* 2000). This has led to new thinking and new questions being asked and addressed in more variable-oriented studies – again mainly by using ideal types (e.g., Esping-Andersen 1999). In this way, the dialogue between case- and variable-oriented studies…

Concluding remarks

We have now illustrated how fuzzy-set theory can be used to study the conformity of specific phenomena to concepts and, in turn, ideal types. It entails four basic steps:

1. Informed by theoretical and substantive knowledge, identify the ideal types' aspects (equal to sets) and their configuration. This lead to the construction of a useful analytical property space.
2. Specify the cases' membership scores in the sets comprising this property space, i.e. scores reflecting the degrees to which cases are in or out of sets where 0 is fully out, 1 is fully in, and 0.5 is the cross-over point, being neither more in nor more out.
3. Compute the membership of each case in the ideal typical model, i.e. the given location in the property space, using the principles of fuzzy-set theory.
4. Evaluate the homogeneity of cases by using the information from the previous step to measure the conformity of each case to the ideal typical instance.

The examples of analysis on policy change demonstrated a series of advantages of the fuzzy set approach with regard to conventional qualitative case-oriented methods and quantitative variable-oriented methods. Fuzzy-set theory demands on an explicit definition of the subject under investigation stimulated the exchange of ideas and knowledge accumulation. This helps contributions to theory development as exemplified by the impact of adding a new dimension, obligations, in ideal types on unemployment insurance. Fuzzy-set theory also showed potential in bridging the world of natural language and empirical analysis in new ways. The configurational view of cases gave a holistic view of cases that is not present in conventional statistical methods. Allowing for partial membership of the various aspects provided a better way to convey the diversity of the real world than dichotomies of yes/no assignments common in case-oriented approaches. In turn this made it possible to investigate the conformity of cases to ideal-typical locations and to evaluate the homogeneity of cases. In other words, fuzzy-set theory gives the opportunity to compare diversity - differences in kind and degree - across countries and over time in ways that have not been possible before. Thereby fuzzy-set theory gives us a new approach to study Weberian ideal types and to investigate how empirical phenomena are similar and how they deviate from some predefined measure.

Figure 1A.

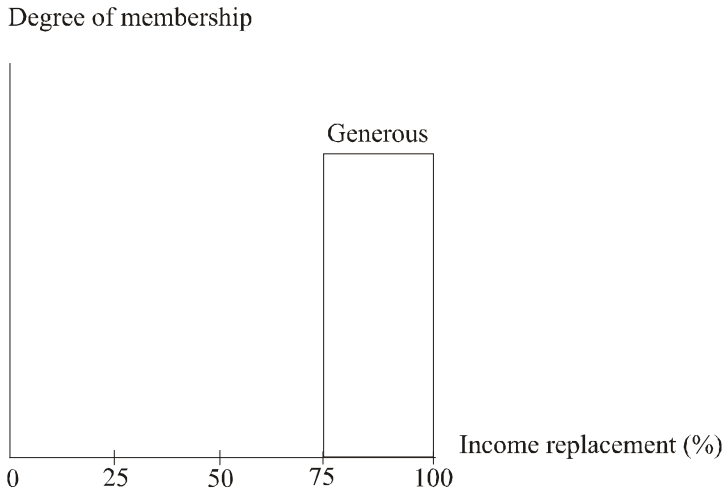
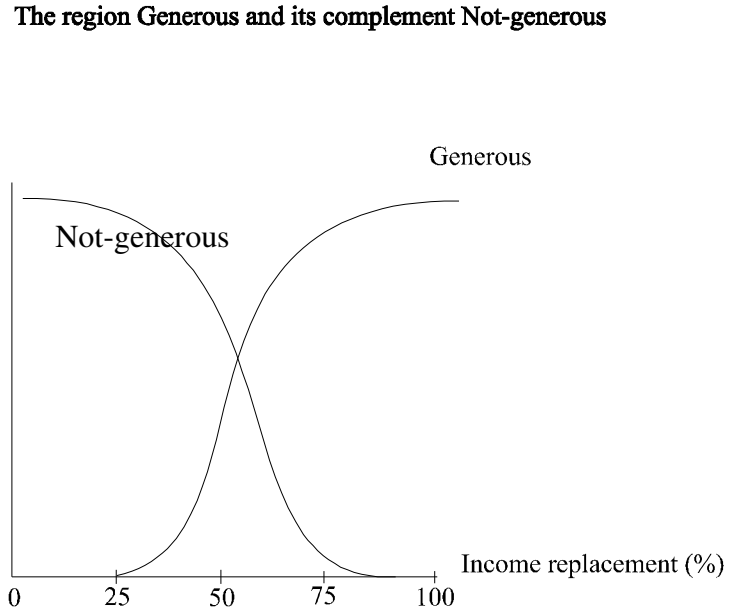
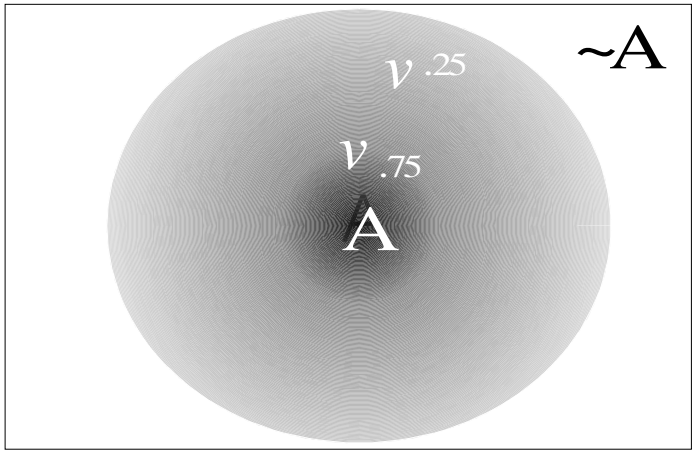


Figure 1B.



Complement

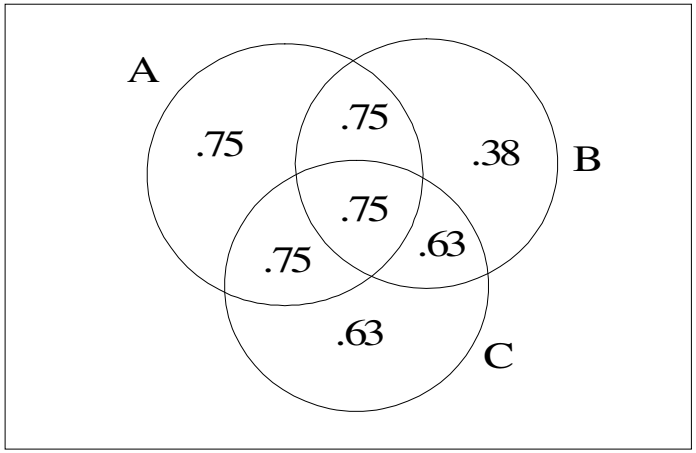


Operations on fuzzy sets are generalisations of operations on crisp sets (see Zadeh 1965, Ragin 2000). Suppose case *x* has membership value v^a in fuzzy set A, membership value v^b in fuzzy set B, and membership value v^c in fuzzy set C:
Complement. The value of *x* in ~A is 1-v^a. This operation finds the complement to A, and is called *principle of negation* in fuzzy set theory.

Intersection. The value of *x* in A*B*C is the minimum value of v^a, v^b, and v^c. This operation represents logical AND, and is called the *minimum principle* in fuzzy set theory.

Union. The value of *x* in A+B+C is the maximum value of of v^a, v^b, and v^c. This operation represents logical OR, and is called the *maximum principle*.

Union



Intersection