SIMILARITY IN HARDER CASES
Sentencing for Fraud

Ruth Murbach
Professor,
Département des sciences juridiques, Groupe de recherche informatique et droit (GRID)
Université du Québec à Montréal, C.P. 8888, Succ. A, Montreal (Quebec), Canada H3C 3P8.
Éva Nonn
Research associate,
Groupe de recherche informatique et droit (GRID), Université du Québec à Montréal,
C.P. 8888, Succ. A, Montreal (Quebec), Canada H3C 3P8.

Abstract

We focus on one of the central concepts of case-based reasoning: similarity. In the field of sentencing, where the really decided cases are often on the harder side, similarity is multidimensional and depends less on formal rules than on various legitimate principles, objectives and factors which relate to the offender, the victim, the act and its social context. The paper presents our data base of empirically analysed cases of fraud and discusses two of the different phases completed to reduce complexity : (1) a decision typology whose categories emerged from in-depth interviews with judges, Crown and defense attorneys and which proved to be statistically significant; (2) experimenting with FXS, a program designed to retrieve similar cases based on their degree of salience. The salience coefficient used is a measure of similarity based on relative high or low frequency of factors in their local context. Particularily promising, although not yet formally explained, are FXS' flexible weighting possibilities.

Harder cases

The idea of different layers of uncertainty, intrinsic to legal reasoning, has been widely discussed both in legal theory and in a growing number of publications on expert systems in law. Legal concepts are indeed most often imprecise; they are interpreted and adapted to new situations following differential strategies. It is in the nature of law and legal reasoning that concepts interrelate to principles and rules in many and sometimes contradictory ways. The reasoner's respective role-model of advice-giving, advocacy or adjudication, as proposed by Lambert and Grunewald (1991), has its importance in terms of strategy and interaction, but is embedded in a context which reaches beyond internal legal normativity. Besides, the common distinction between "easy" and "hard" cases runs through the jurisprudential debate and leaves the expert system builder in the uncomfortable position of having to draw artificial boundaries between the former and the latter, in order to define a grey zone as her playground: harder than easy and easier than hard; neither too easy to be valuable in terms of theory, practice and social relevance, nor too complex to be technically feasible. The task is further complicated by the indeterminancy of rules, when applied to changing social representations, interactions and individual behaviour.

Even if we accept the necessary reduction of reality, the modeling procedure should yield up to some degree of depth and guarantee internal and external validity. These problems, often referred to, are amplified in certain fields of legal reasoning where principles and standards

intermingle with strategies and subjectivity and outweigh rules. Sentencing happens to be such a field - not quite representative of legal reasoning in general - where judiciary agents, when interviewed, usually hide behind their individual methodologism and agree only to say that each case is unique.

Perhaps some if not most sentencing decisions do fall into that category of hard cases which Skalak and Rissland (1989) excluded from the reach of any system: those which might require social policy decisions. Although they referred to the limits of the technically feasible only, one might as well add the question of ethics, at least when talking about sentencing. De Mulder (1989), less categorical, rather that we still lack a scientific basis of law and that empirical knowledge - meant to be a precondition for any attempt to conceive an expert system - falls short.

To the first objection we could counter that some assessment is imperative, notably since the number of sentencing-systems is growing[1]; in fact, this is the perspective we have been following in our ongoing research for the last few years[2]. One might also add that the definition of hard and easy cases is continuous rather than binary. De Mulder's point, on the other hand, is more of an invitation to create a knowledge-base empirically than to discourage researchers altogether. We accepted this challenge, admittedly underestimating the magnitude of such an enterprise. And it is quite paradoxical that we had to do so in a field where an exceptionnally large number of studies on various legal and extra-legal sentencing issues has been published in the last two decades[3]. Although useful in throwing light on some particular features, these empirical analyses are difficult to integrate since they focus on isolated elements intervening in the decision making process. Besides, theories do not travel easily from one socio-cultural setting to another (see Douglas 1992), while local or national statistics or recent domestic research results are not available for the subfield chosen : fraud.

Case-based reasoning and similarity in sentencing

Sentencing, in a formal sense, is arguing based on a few rules, a variety of legitimate principles, different objectives and taking into account numerous factors in various degrees, which sometimes point in opposite directions. These factors relate to the offender's background or behaviour, to the victim, to the act or to the social context. As with many other legal cultures, the Canadian justice system has no single agreed upon, explicit theory of sentencing, but multiple and not always coherent ways of combining and weighting these elements on the judicial scene, in symbolic and rhetorical interaction. As a result, unjustified sentencing disparities have been constantly decried, yet without finding a reliable means to determine the "good" sentence *while* leaving enough discretionary power to the judiciary[4] *and* avoiding undesired side effects[5].

There is however agreement on one basic principle: that similar sentences should be imposed for similar offenses committed under similar circumstances by offenders presenting similar characteristics. Yet the concept of similarity, central to case-based reasoning, is far from clear, both for the judiciary and for the researchers in the field. Some builders of sentencing expert systems, such as Lovegrove (1989), disenchant, admit their failure to determine the respective role each factor plays, and consider it impossible to compute its real weight for different cases, at least when using a code-based typology. Others (Gruner 1989) can simply ignore that similar factors should be weighted differently in different cases and end up with ready-made predictable outcomes; particularily those who develop rule-based systems designed for the administration of mandatory quantified sentencing guidelines, as they exist in a growing number in the United

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1 See for example Chan (1991), Bain (1986), Doob (1987, 1989), Gruner (1989), Lovegrove (1989), de Mulder and Gurby (1983), de Mulder (1982), Hogarth (1986) etc.

2 We acknowledge research support granted by the Donner Canadian Foundation and by the Canadian Social Science and Humanities Research Council.

3 See Hann and Kopelman (1986, 1987); Hazel (1992); Hogarth (1971, 1986); Hudson (1989); Kort (1966); Lovegrove (1987, 1989); Miethe and Moore (1989); Myers (1986, 1987, 1988, 1989); Ruby (1987); Thomas (1983), and many others.

4 The lack of a consensus approach is but one of the reasons most often invoked to explain sentencing disparities. Equally important are the absence of sentencing guidelines, insufficient information on current practice, idiosyncracies of judges, regional particularities, or the difficulty of the human mind to consider at the same time a large number of complex factors.

5 Such as overcrowding of penitentiaries.

States, have less to care about the relative significance of the decision's elements. The decision has to match the rules established by the guidelines, which are supposed to guarantee similar treatment for similar cases. The critiques adressing this policy, which paradoxically displaces the discretionary power from the judge to other judiciary agents, are however numerous.

In Canada, mandatory but also presumptive sentencing guidelines have constantly been refused[6] and the difficulty to define similarity remains the leitmotiv of the sentencing-debate. This holds true also within the particular domain chosen: "fraud", where the decisions are considered to be often on the "harder" side and multidimensional[7]. The common expression "fraud" applies in fact to a heteroclite set of offenses, in terms of modalities of commission, level of planification, social background of offenders and severity of sanctions imposed. Scattered throughout the Canadian Criminal Code are indeed no less than 73 different offenses associated to its popular sense. Nevertheless, not all sections are equally important in terms of frequency of charges. Similarity as well as disparity are difficult to establish empirically even on a general level, since virtually no statistics and very few written case law are available for comparison.

Except for appelate cases, the sentencing argumentations are oral, recorded on audio-tape only. However, four out of five cases take less than four (4) minutes to decide, what means that the announcement of the sentence comes without any "debate", most often following a common suggestion of Crown and defense, which will be accepted by the judge. In a certain sense, these cases are "easy", at least at the sentencing stage; the factors "pleaded" during the bargaining phase substitute formal arguing and "judge shopping" reduces the risk of a refusal of the common suggestion. To create our own knowledge base, we selected only longer recorded cases with at least some argumentation; they had first to be transcribed. We collected (besides the Appeal Court decisions, the relevant law, principles, and objectives) a random sample of 403 such cases, decided during the last five years at the Quebec provincial court[8]. Since we aimed at constructing theory rather than applying it or testing hypotheticals (see McCarty 1991), we adapted Glaser and Strauss' (1967) grounded theory approach, when analysing the expressed facts and the principles, objectives and factors considered in each case. In this manner, an empirical decision-grid emerged gradually. We ended up with three complex sets of 144 interrelated variables reflecting the arguments of each actor: judge, Crown and defense attorney; 35 additional variables concern general information on the case.

Reducing complexity : an empirical typology of fraud

But how to determine similarity out of complexity? At what level of analysis are the different dimensions of a case comparable and actually compared to one or several other decided cases? How do the decision-makers proceed in their respective roles to end up with an outcome which most often satisfies the three of them, since appeals to sentences are exceptional? We mentioned the sentences pronounced following a common suggestion, an efficient means of transforming hard cases into easy ones. Without such an arrangement, a really argued case could also be considered easy if an Appeal Court decision, binding, offered such a comparison and if at least one actor is aware of it. In all other situations, as shown by our interviews, similarity and comparison will depend as much on the personal reference base each one compiles out of his own experience and discussions with peers, on the precedents presented in court, on personal reasoning styles as on the perception each one has of the usefulness to compare. Interviews indicated that they do not all subscribe with the same conviction to the necessity of comparison in each case.

The legal definition and certain restrictions barely determine a starting point; in fact, the only restriction left in the field of fraud is the maximum sentence provided for in the Criminal

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[6] The recommendations of the Canadian Sentencing Commission (1987) to introduce presumptive sentencing guidelines have never been accepted.

[7] For "easy" cases, the concept of similarity is clear and one-dimensional, in the sense that the comparison has to match one category only.

[8] There is indeed agreement on the variables time and space in the sentencing debate: similarity means that the decision has to match similar cases decided within a certain contemporary time frame and within regional boundaries.

Code. Ironically, the policy of maximum sentences has lost its *raison d'être* years ago, when capital punishment was abolished. But the apparent complexity of the Code is somewhat reduced, or at least restructured, since judges as well as Crown and defense attorneys agree[9] on a sort of grouping, an informal typology which creates certain clusters of associated factors and orients the decision process on a meta-level. The criteria of this categorization are however neither consistent (relating to victim, offender or act) nor always exclusive but do reflect a certain "fact pattern" (Kowalski 1991) close to Skalak and Rissland's (1991) "dimensions" or Lambert and Grunewald's (1991) "paradigms".

It is important to note that the categories' underlying logic differs both from that of the Criminal Code and of the Appeal Court. This typology creates the following broad categories:

(1) frauds on the government (committed by government officials, professionals or business people);
(2) other white collar crimes;
(3) Welfare fraud;
(4) fraud on employer by employee (breach of trust);
(5) other breach of trust;
(6) forgery or uncovered cheques (victim: financial institution);
(7) forgery or uncovered cheques (victim: other);
(8) possession or use of stolen credit card;
(9) "professional defrauder";
(10) other fraud.

One-dimensional similarity, for an "easy" case, could be established by its belonging to a particular category. The quantitative analysis on the typological meta-level shows, that the categories are indeed not only unequal in size but do also reflect statistically significant different outcomes. Most important in terms of frequency are types (8), credit card offenses, and (9), "professional defrauder", with 23.1% and 19.6% respectively. They are followed by categories (7) and (8), related to cheque offenses against financial institutions or other victims (14.9% and 12.7%). Welfare frauds (3) constitute 5.2%, while white collar crimes in general (3.2%) or against the government (2.5%) are less important. Finally, a category "other" (9.9%) assembles cases without any of the above mentioned characteristics related to either mode of commission, actor or victim.

Although unequal, these categories discriminate significantly when we compare the means of imposed sentences by type. Distinguishing on a broad *in* or *out* level, the analysed representative sample of harder cases shows that, for example, 84.8% of "professional" defrauders, but only 46.2 % of white collar offenders have to spend some time in prison[10], while 81% of those who cheated on the Welfare system and 70% of those who frauded the government in other ways were not incarcerated[11].

Similarity and significance of factors

In the Canadian situation, where no agreed upon formal sentencing policy reduces the complexity of sentencing decisions, even if in a certain sense, as mentioned above, the negociating practice between Crown and defense does so, the similarity of all other cases is rarely one-dimensional. Interesting in terms of theory construction is the comparison between the clusters of considered factors which characterize the different types. Although the factors are recurring, their number, e.g. the combination of factors underlined, does differ from category to category, but also between judge, Crown and defense attorney, within the same category.

Useful in further reducing the complexity, the typology remains however a black box in so far as it does neither define the relative importance of a particular factor within the cluster, as applied to different cases of the same type, nor the various significations it may take, nor the reasons for its presence or absence in the judicial discourse.

The aggravating factor, "substantial amount", for example, may represent virtually any amount: as easily $ 300, if the victim is an elderly women on Welfare, as $ 3 millions if the victim is a financial institution. On the offender side, the mitigating factors of "excellent reputation", "good social background" or "exceptional visibility", for example, are related to a certain social standing that Welfare defrauders do not usually have.

[9] Based on in-depth interviews conducted with 12 judges, 8 Crown attorneys and 6 defense attorneys.

[10] Compare to a sample mean of 46.2%.

[11] Compare to a sample mean of 53.8%

Another factor, restitution, plays an ambiguous role since "partial restitution" may be considered in one case on the aggravating side and in another, as a mitigating factor. The same holds true for "drug addiction", whose interpretation indicates quite often preference for a particular sentencing goal.

Significance and rhetorical factors

It is at this point that qualitative, and rhetorical analysis in particular, may allow to further reduce the number of factors or to determine their relative importance. Perelman's approach (1970, 1978) has indeed been used to account for the tension between rules, judicial discourse, facts and expectations of different audiences (Lajoie et al. 1992). Following this perspective, we assume that the weight of certain factors depends on the degree of expectation and kind of audience it is meant to meet, in a mostly rhetorical way. The interview material offers some cues in this sense, particularily when we compare the perception each actor has of his own and the other's respective roles. The mental images are quite consistent within each group and for each judiciary agents' position, but show considerably less congruity between the groups, particulary concerning the judge's role.

The typology is also useful in so far as the types assemble cases where the volume of rhetorical argumentation is more or less important. If the degree of rhetoric is striking in the categories "frauds on the government" and "Welfare fraud", this kind of argumentation is considerably reduced for those who are considered "professional" defrauders. It is quite possible that, in the latter case, the principle of gradation outweighs particular factors, leaving the decision-maker with a chain of previous convictions and gradually increased sentences which inevitably determine the outcome. In terms of dimensions, the "professional" defrauder may become an easy case. Finally, certain moralizing expressions have no real weight and tell more about the judge's attitude than his decision making behaviour.

Similarity and salience: experimenting with FXS

Rhetorical analysis contributes in reducing the variety to a more manageable number of factors, and in this way restricts the case structure empirically. Nevertheless, even the reduced number of factors has to be put into some order to establish similarity, and is open to internal contradictions. We are aware of Arrow's haunting paradox, as discussed by Skalak (1990) when applied to case-based reasoning systems, and try to avoid it by working with numerical but relative weights or "magnitudes", to use Ashley's (1989) term. This was one of the reasons we chose to experiment with the possibilities of FX and FXS[12], two tools defined by their designer as programming layers rather than computer languages. The main objective of FX is to represent the knowledge units in arborescent structures, while FXS compares these structures, or part of them, to retrieve similar phenomena following their degree of salience. Open to change, FXS appears to be a flexible tool for creating and experimenting with different models of similarity. In a first phase, we used FX to enter the data and structure of the huge knowledge base. We regret that space does not allow us to go into any details. In the remaining part of this paper, we will rather present FXS' features and its eventual usefulness in the field of sentencing.

FX and FXS model knowledge in "beams" (*faisceaux*) which contain the knowledge units, the function's various forms and the comparison rules (*règles d'appariement*). A beam is defined by its qualities: head, deployment and mode of deployment, and by its localisation within the structure. On a conceptual level, a beam is autonomous. Its goal is to compose, with other beams, a structure which models the case. In theory, each beam can modify the structure, totally or partially, from its position. Unlike other systems, FXS attaches the function to the variable, rather than the variable to the function. To determine similarity between cases, FXS generates first the structures' matrices and calculates their relative distance parametrically.

Four different parameters are used which together constitute the *salience coefficient*. (1) The first, calculated automatically for each factor, relates to the whole case base and measures the discriminating power of a particular factor (*gain à*

[12] FX and FXS (faisceaux de saillance) have been developed by Pierre Plante, ATO°CI, Centre de recherche en cognition et informatique, Université du Québec à Montréal, C.P. 8888, Succ. A, Montreal (Québec), H3C 3P8 Canada.

la portée). It is in a certain sense the contrary of frequency[13]. (2) The second parameter (*gain à l'expressivité*), also calculated automatically, compares each factor in terms of the number of siblings at the same level of its internal position. The effect of both parameters can be enhanced or diminished manually. (3) Particularily interesting for our purposes is the next parameter, called *local factor*, which allows the assignment of weights to the different units, at any level, to counterbalance an eventually too strong effect of structural ascendency. This can be done in three different ways: temporarily, eg. in the course of a search where certain factors will be weighted; it is also possible to predefine a weighted case in order to search within a restricted base; a third option is to assign weights more definitely, by integrating them into the head of the beam. Finally, the last parameter (4), the concomitance coefficient *(coefficient de concomitance)*, could be used to assess the final model's reliability.[14]

Before presenting the experimental steps undertaken, it is perhaps useful to explain that FXS has been applied previously, and quite successfully, for knowledge bases structured in less dimensions, particularily in the field of zoological and botanical classification, comparison and identification. Decision analysis in the social domain, however, seldom has agreed upon, steady categories and cannot be simplified beyond a certain number of co-present interacting factors, even for experimental purposes. Even extremely reduced, they outnumber the experimental dimensions of the original zoological model and ask for far more complex, flexible structures. In this sense, we had to start at a higher level of complexity.

Our example

For the sake of experimenting similarity with FXS, we selected part of the case of a professional defrauder (c355 in our base). We used the description of the events as expressed by the judicial actors - obtaining $ 65 000 by illegitimate use of credit cards - and concentrated on the recorded arguments relating to objective seriousness only.

The *Crown attorney* had underlined the objective seriousness of the events because of its duration but also volume (important amount). He pleaded aggravating circumstances due to the offender's criminal record (numerous and in similar matters; previous imprisonment sentences). He also argued on the aggravating side that there was little chance of restitution. On the other hand, he mentioned the offender's positive attitude during the criminal procedures (cooperation with police; pleaded guilty rapidly).

The *judge* referred to the social context and the growing frequency of fraud by credit card when talking about the objective seriousness of the events. He underlined aggravating circumstances only, such as the offender's criminal record (numerous and in similar matters) and called him a "professional" defrauder.

The recorded discourse of the defendant's *attorney* shows, of course, elements in favour of mitigating circumstances. He underlined the positive attitude during criminal procedures (cooperation with police; pleaded guilty rapidly). In terms of individual mitigating circumstances, he mentioned the defendant's health (psychological problems, alcohol problem), his poor education and his socio-economic situation (financial and family problems).

We undertook several series of tests based on this case, and evaluated the results by analysing the actual similarity of the cases the system suggested to be similar, based on the calculations of the salience coefficient. Our primary criteria was, of course, the appearance of the searched for case : c355.

(1) Formulating the searches in the perspective of each one of the judiciary actors (e.g. entering the factors underlined in their respective argumentation), without any particular weighting, produced the following results: For the Crown attorney's perspective, our experimental case appeared in third position, following a relevant and an irrelevant case. For the defense attorney, c355 was in twelfth position only, preceded by 10 irrelevant and one relevent case. For the judge, finally, the result was similar to the Crown, our case ranking in fifth position, behind four pertinent cases. The outcome was equally positive, as we searched within the combined

[13] See also the concept of "information function" developed by Shannon and Weaver (1964), as mentioned by Plante (1990).

[14] Since we are still experimenting different theories, we excluded it for the time being.

discourse of the three actors, with c355 in fourth position, preceded by three very relevant cases.

These results indicate that, at least for the defense, whose argumentation is in general limited to mitigating circumstances, similarity by salience generates less relevant results in the case of the "indefendable" professional defrauder.

2. The analysis of the salient factors, in the above test, showed also that certain only exceptionally used factors ranked very high, such us "poor education". This expression appears in fact only four times in the whole base of 403 cases, as underlined by the defense. The arborescent structure, essential to reflect the domain complexity, may lead to unjustifiable results, and this example shows that some function should provide for limiting the strength of peripheral details. One way would have been to eliminate expressions with very low frequency from the base altogether, in the same way that purely rhetorical factors should not be considered. Another way would be to attribute a lesser weight to each of these factors. We tried to find other means to limit the salience of such exceptional factors. First, we reduced to half (0.5) the influence of the second parameter which compares each factor to its siblings, within a deployed beam. The second way is to inhibit the strength of the structural ancestry by calculating the salience on both levels : factor and head of the beam.

Using this modified configuration for the Crown produced however a result whose interpretation is not easy: our test case c355 appeared on top of the suggested similar cases, followed by a variety of relevant and irrelevant references.

3. We have underlined the particular interest of FXS' local factor parameter which allows to assign weights to the different units at any level. Testing this feature based on our own "expert" knowledge of the relative importance of the different dimensions and factors, we first assigned weights intuitively, in a "more or less" manner. The results being very encouraging, we nevertheless decided to replace intuition by more reliable measures. Having completed the statistical analysis of the case base, we tried to use the regression coefficients calculated for the dimensions[15], by actor. The result was almost as encouraging as the one obtained by intuitive weighting: the test case c355 ranked first, followed by three relevant references, one irrelevant case (belonging to the category of Welfare fraud) and three more relevant cases..

Promising as these first results are, we still cannot explain why certain other pertinent cases we know to exist in our knowledge base do not appear in the results. In other terms, we are not yet able to explain nor to justify why salience would be preferable over exhaustivity, in the judicial setting, supposing the noise problem to be resolved. This also illustrates our still unanswered and equally fundamental research proposition: to assess empirically the relative validity of necessarily broad statistical analysis and of individual case by case comparison in the field of sentencing.

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[15] For several factors the number of observations was too small to allow for significant multivariate regression analysis.

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