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Remarks on Giovanni Sartor's Paper, *The Logic of Proportionality: Reasoning with Non-Numerical Magnitudes*

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In his brilliant paper *The Logic of Proportionality: Reasoning with Non-Numerical Magnitudes*, Professor Sartor provides a multi-layered analysis of proportionality based on a model of teleological reasoning governed by value-norms, arguing that this kind of reasoning is quantitative but non-numerical, i.e., operates on magnitudes to which no symbolic numerals are assigned. The analysis pursued by Professor Sartor can be divided into three parts. In the first part, drawing on the theory of bounded rationality, Professor Sartor develops a model of teleological reasoning (of which proportionality reasoning is a special case) distinguishing its four stages: Value-adoption, goal-adoption, plan-adoption, and action-adoption. In the second part, he introduces and develops in great and illuminating detail a distinction between value-norms and action-norms. In the third—main—part, Professor Sartor makes the basic claim of his paper that proportionality reasoning (i.e., reasoning aimed at establishing whether a given legislative norm interfering with some constitutionally protected right is "proportional"), involving the assessment of the impact of choices upon relevant values, is quantitative but not based on numerical magnitudes, and develops a conceptual framework for reconstructing this reasoning and explicating its constituent elements (suitability, necessity, and balancing in the strict sense). Each of these parts abounds with valuable analyses and precious insights and would deserve a separate commentary, yet I shall confine myself mainly to the analysis of the third part, in which he develops his basic claim. I shall focus in the first place on two interpretive problems my reading of Professor Sartor's paper has given rise to, though some of my remarks will concern also more technical matters.

(1) The first interpretive problem of Professor Sartor's paper is how *strong* he intends his basic claim to be. Now, it seems that one can distinguish at least two interpretations of this claim, which can be called "weak" and "strong." On the "weak" interpretation, the claim asserts that agents engaged in proportionality reasoning usually do not use—or never use—any numerical magnitudes (symbolic numerals) even though, in principle, it would be

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possible to conduct such a reasoning with the usage of such magnitudes. Thus interpreted, Professor Sartor's claim is a descriptive hypothesis implying that lawyers engaged in proportionality reasoning do not have the impression that what takes place in their minds when they apply this kind of reasoning resembles the process of solving mathematical problems. Therefore, they would probably concede, were they asked to fill in some psychological questionnaire, that even though they do not mentally quantify numerically, they practice non-numerical quantification (i.e., quantification based upon more or less vague comparisons of magnitudes, e.g., "twice as much," "much larger," "considerably smaller," etc.) and do not strive to reconstruct this reasoning *ex post* in mathematical—numerical—terms. Based on this interpretation, Professor Sartor's basic claim seems very plausible: If proportionality reasoning practiced by lawyers is quantitative at all, it is —as can be safely conjectured—quantitative only with non-numerical magnitudes. On the strong interpretation, the claim asserts that agents engaged in proportionality reasoning do not use any numerical magnitudes, because it is impossible to conduct this type of reasoning with the usage of symbolic numerals. This interpretation of the basic claim seems less cogent: One can propose various ways of capturing numerically—even if e*x post* and even if arbitrarily and implausibly—the basic features of proportionality reasoning. One can easily imagine a lawyer with a mathematical bent, who tries not to proceed intuitively when engaging in proportionality reasoning but, rather, with the help of more or less sophisticated mathematics based on symbolic numerals (which does not mean, of course, that such a mathematically-bolstered proportionality reasoning will be better in any sense than its intuitive version). Arguably, Professor Sartor assumes the weak—more plausible—interpretation.

(2) The second interpretive problem is related to Professor Sartor's defense of his basic claim. It seems that Professor Sartor provides two different, not discordant, arguments for it. The first argument draws on the general insights of cognitive sciences according to which human beings are endowed with a capacity for analogical quantitative reasoning, i.e., reasoning without explicitly expressed numbers. This capacity phylogenetically precedes and arguably underlies our competence of mathematical reasoning with symbolic numerals. Since, as cognitive scientists emphasize, this capacity is used in many types of reasoning, it can be reasonably supposed, so Professor Sartor's argument appears to proceed, that it is also employed in proportionality reasoning. The second argument has a reverse direction: it is an inference of the existence of such a capacity, or at least of its underlying proportionality reasoning, from the nature of proportionality reasoning. It seems that Professor Sartor formulates precisely this kind of argument in the following passage:

> In most legal cases . . . we do not seem to have sensible and uncontroversial ways for assigning numerical quantities to the level of achievement of our values and to their weights, so that we can build a single numerical value expressing the merits of each

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> choice . . . to explain how we are able to make reasonable choices on the basis of their impacts on different values even though we cannot sensibly express these impacts through numbers, we have to assume that people (in particular, legislators and judges) possess some (more or less inborn) capacity to reason quantitatively which is non-numerical. [1]

It seems that Professor Sartor says two things here: (1) the account of proportionality reasoning according to which it involves assigning numerical quantities to the level of realization of the values at issue and their weights is wrong because there is no sensible and uncontroversial way of assigning such quantities and thereby, given the nature of proportionality reasoning, it is impossible to conduct it with the usage of symbolic numerals. (2) agents involved in proportionality reasoning can use (owing to the very nature of proportionality reasoning) only non-numerical magnitudes. This argument[2] does not seem convincing. If what Professor Sartor means by our not having "sensible and uncontroversial ways for assigning numerical quantities" is that there are no objective, commonly agreed-upon, criteria for assigning such values, it is hard not to agree with him. But from the non-existence of such criteria it does not follow that "we have to assume that people (in particular, legislators and judges) possess some (more or less inborn) capacity to reason quantitatively which is non-numerical." The necessity of introducing the postulate of the existence of the capacity to reason quantitatively but in a non-numerical way does not follow because the fact that there are no objective and commonly agreed-upon criteria for the assignment of numerical quantities does not imply that people engaged in proportionality reasoning do not in fact assign such quantities—even if, unconsciously and entirely arbitrarily. What follows is only that it may be impossible to ascertain which, of many possible "numerical" assignments, e.g., to the weights of different values, made by various agents, is a "correct" one. It should be stressed, though, that from among the two arguments Professor Sartor appears to regard the first as the main one, so that even if my critique of the second argument were correct, it would not seriously undermine Professor Sartor's basic claim on its weak interpretation.

The remaining three remarks are of more technical character, and of lesser importance.

(3) Assuming the correctness of Professor Sartor's basic claim about the quantitative but non-numerical character of proportionality reasoning, it is still not certain whether the sophisticated and impressive theoretical framework—which he plausibly interprets as providing a generalization of famous Alexy's balancing formula—proposed by him to

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[1] Giovanni Sartor, *The Logic of Proportionality: Reasoning with Non-Numerical Magnitudes*, 14 GERMAN L.J. 1419 (2013).

[2] Harmonizing with and supporting the strong interpretation of Professor Sartor's basic claim.

model and restrain by rationality requirements this reasoning really makes no commitment to introducing numerical quantities. For instance, in Definition 11,[3] Professor Sartor writes, "the absolute utility-impact of action α on value *v* is the proportional contribution of α to the utility by *v* multiplied by the weight of *v.*" But such a multiplication seems to be feasible only on the assumption that one can ascribe numerical quantities to α and *v*. Likewise, Professor Sartor requires that the degree of realization of a given value be expressed by some fraction from the range from 0 to 1. As it seems, one can dispense with numerical symbols only in the context of quantitative reasoning with Pareto-superiority, because such reasoning does not necessitate determining the magnitude of the impact of a given choice on the realization of values at issue; it only necessitates determining whether this impact is positive or negative.

(4) Professor Sartor writes:

> The action-norm/value-norm dichotomy does not coincide with other dimensions according to which we can classify legal norms. First of all it must be distinguished from the opposition between defeasibility and indefeasibility, which concerns the extent to which a norm is susceptible of being overridden by reasons against its application in particular cases. Action-norms too can be defeasible. . . .[4]

Thus, Professor Sartor implies that both action-norms and value-norms can be defeasible. But later, on the same page, he writes that "when two scalable values are in conflict (the achievement of both values cannot be jointly maximized), the best compromise usually requires that neither of them be completely neglected to the advantage of the other (given that the satisfaction of values provides a decreasing marginal benefit."[5] But this very plausible account appears to imply that value-norms cannot be "defeated" unless a very rare situation takes places in which one of them should be "completely neglected." Thus, as it seems, there is a kind of overlap (though, of course, not perfect) between these distinctions: Value-norms seem to be much more often indefeasible than action-norms.

(5) In footnote 8, while illustrating how one could possibly (on the *counterfactual* assumption that one could determine appropriate numbers) "determine the impact of a choice on the relevant values and aggregate such impacts into a determination of the

[3] *See generally* Sartor, *supra* note 1.

[4] *Id*.

[5] *Id*.

overall benefit or loss that is provided by that choice as compared with different possible choices"[6], Professor Sartor assumes that "the degree of satisfaction" of relevant values by a given choice should be expressed in numbers relative to the weight of a given value. Thus, for instance, if the weight of value "v" is 4, its degree of satisfaction by a given choice "c" can be no greater than 4; the weight of a given value is therefore the upper limit of its satisfaction. There are two problems with this procedure. First, it does not specify the lower limit of its satisfaction—Professor Sartor implies that it can be below zero. Second, even if such a limit could be specified, the whole procedure would still seem implausible, as it implies that numbers expressing "the degree of satisfaction" are relative to values—in the sense that the interval from which to pick numbers expressing the degree of satisfaction depends on the weight of values. This seems implausible because the possible degrees of satisfaction should, as it seems, be the same for all values and should be contained in the same range, such as from 0 to 1, with 1 being full satisfaction. This procedure leads to counterintuitive results because it implies that the same degree of satisfaction of two values "v_1" and "v_2,"say, full satisfaction, has different impact on the two values. For instance, if the weight of v_1 is 4 and the weight of v_2 is 2, then the result of appropriate multiplications being factors in the calculation of the expected value of a given choice, will be, respectively, 16 and 4, and therefore their proportion will be 4. While, intuitively, their proportion should remain the same as that of their weights (i.e., 2). If one chose instead the same range of possible degrees of satisfaction for all values, such as, the above mentioned [0-1], then the proportion would indeed remain the same. This remark, of course, is of marginal importance: The above procedure proposed by Professor Sartor is meant for the account of reasoning that he rejects—quantitative reasoning based on numerical magnitudes.

[6] *Id*.