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**Truth and Adequacy.
Remarks on Petrażycki’s Methodology**

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Abstract:

The paper discusses the concept of adequacy central for Petrażycki’s methodology. According to Petrażycki any valuable scientific theory should be adequate, that is, neither limping (too broad with respect to its actual scope) nor jumping (too narrow with respect to its actual scope). Consequently, adequacy of a theory is a stronger condition than its truth. Every adequacy theory is true, but not conversely. However, there is a problem, because scientific laws are conditionals (implications). This suggests that adequacy is too strong a condition, because the consequence of an implication has a wider scope than its antecedent. Thus, laws should have the form of equivalence. The paper shows how model-theoretic characterization of theories allows to recognize truth and adequacy, consistently with Petrażycki’s claims.

Keywords: theory, truth, adequacy, model.

Leon Petrażycki (Eng. spelling: Petrażycki) considered methodology of science as the fundament of successful scientific research. His methodological considerations were mainly addressed to social sciences, in particular, to legal theory. According to Tadeusz Kotarbiński [2, p. 439] (page reference to 2nd edition; unfortunately, this fragment is omitted from English edition published as Kotarbiński 1966): “We constantly note tendencies to form the humanities in the shape of theory, not only history. We maintain that Petrażycki’s writings present the peak point of such claims from the point of view of methodological self-knowledge.”

Kotarbiński’s assessment is related to a well-known controversy in the philosophy of science concerning the nature of the humanities. This controversy was particularly vivid in German philosophy in the second half of the 19th century. One camp (mostly Neo-Kantians from the Badenian school) considered the humanities as *idiographische Wissenschaften* (idiographic sciences) aimed at description of facts (historical, religious, linguistic, etc.) and not pretending to formulate general laws. Max Weber defended the view that the humanities, at least a part of them, can be *nomothetische Wissenschaften* (nomothetic sciences), that is, producing (or discovering) laws. In France, August Comte listed sociology (science on social facts) as one of general sciences. Note that the German term *Wissenschaft* (and French science has the wider scope than English “science”

– the latter refers to natural sciences, but the former – to all academic fields. In what follows, I am using the term “science” as synonymous of *Wissenschaft*.

Petrażycki’s position in the controversy over the status of humanities was closer to Weber and Comte, although he did not refer to these authors. In fact, he mentioned in his methodological writings no name of protagonists participating in the related polemics. As a person who studied in Germany at the end of the 19th century, Petrażycki had to know what was going in discussions on the general methodological problems as well as special issues, like the prospects (or not) on converting the humanities into genuine systems. As I earlier note, Petrażycki formulated his methodological claims as directed to jurisprudence, particularly legal theory. Let us say that “jurisprudence” is a generic term and all legal investigations fall into its scope. Traditionally, legal history and doctrinal studies on law (*Rechtsdogmatik*) belong to jurisprudence beyond all doubts. The problem is with the field called legal theory. In German speaking world, *Rechtstheorie* is a part of jurisprudence (*Rechtswissenschaft*) as a general science of law. This use was adopted in Russia as well as in Poland. Petrażycki wanted to reform legal theory as *Rechtstheorie*. According to him, the traditional legal theory was too much dominated by *Rechtsdogmatik* and this fact very negatively influenced related investigations. Roughly speaking, Petrażycki argued the subject-matter of doctrinal studies of law (this field analyzes so-called positive law) did not constitute the proper object of legal theoretical research. The subject-matter of legal theory is different than of *Rechtsdogmatik*. Petrażycki identified law as a collection of psychic entities of a kind, namely emotions in which rights and duties are correlated. They constitute law as a real phenomenon. Consequently, legal theory is about law in this understanding.

Although Petrażycki was mostly interested in the foundations of legal theory, his methodology has a very general character and can be analyzed independently of its applications in the *Rechtswissenschaften*. I take this course and will consider Petrażycki’s ideas as belonging to general methodology.

Bibliographical Remark

Petrażycki presented his methodological views in his book *The Study of Law and Morality: The Bases of Emotional Psychology* (St. Petersburg 1905, 2nd ed., 1907, 3rd ed. 1908; Polish tr., Warszawa 1930, 2nd ed., 1959). Chapter 1 of the collection L. Petrażycki, *Law and Morality* [5] contains main Petrażycki’s methodological ideas. The entire methodological part of Petrażycki’s book of 1905 was translated into German as *Methodologie der Theorien des Rechts und der Moral, Zugleich eine neue logische Lehre von der Bildung der allgemeinen Begriffe und Theorien*, Librairie du Recueil Sirey, Paris 1933. Finally, let me mention L. Petrażycki, *O prawie i moralności. Selected Writings* (On Law and Morality), ed. by A. Kojder, Państwowe Wydawnictwo Naukowe, Warszawa 1985, which contains extensive selections from Petrażycki’s methodological works.

The concept of scientific theory and conditions of its correctness are central for Petrażycki’s methodology [5, pp. 17-21]. According to him, a theory is a collection of truths about some classes of objects. In particular, even a single general statement can be a theory. For simplicity, I will consider this last case (I use modern notation; the sense of * will be explained later):

(1) $\forall x(Sx * Px)$

be a scheme of a theoretical statement. It contains two predicates *S* and *P* which refer to concepts. The character of concepts is of the utmost importance for Petrażycki. He regards theoretical concepts (notions occurring in theories) as class-concepts. A class is a set (collection) of objects possessing certain property. If *Q* is a such property, every object which satisfies the condition *Q*(*x*) belongs to the class related to *Q*. For instance, if *Q* means ‘is white’, every object satisfying the condition ‘*x* is white’ belongs to the class-concept denoted by *Q*. This understanding of classes is extensional. In more traditional terminology, a class constitutes the scope of a common noun.

Generality is necessary but not sufficient condition of theoreticity, so to speak. Thus, not every general concept is a useful class-concept. Although Petrażycki did not formulate the sufficient

condition, one of his remarks is very important. We can formulate several general statements on vegetables from the point of view of cooking or about game (animals) from the point of hunting, but it would be improper to say that such assertions form a theory. Interests of cooks or hunters are governed by practical tasks. According to Petrażycki using words in a way suggested by practical aims is common in ordinary language. Hence, scientific terminology should be independent of such prejudices. For instance, the meaning of the word ‘law’ (in legal sense) is usually suggested by practical needs of lawyers. This circumstance decides that lawyers identify law with positive law. This tendency make difficult to observe that law is a psychological phenomenon (see above). Class-concepts must, according to Petrażycki refer to uniform collections of objects. He tried to explain the mentioned uniformity by invoking some methods of forming concepts and justifying theories. Petrażycki did not believe in simple inductive methods consisting in observing particular instances and making generalizations. He claimed that we should discover essential causal connections via careful applications of Mill’s canons of eliminative inductions. Although this part of his methodology appears as quite traditional, Petrażycki’s view on theories was quite modern. He considered theories not as reproductions of reality, but rather as a scheme of explaining and predicting phenomena.

An instance of the scheme (1) in order to be a genuine theory must be adequate. According to Petrażycki, the requirement of adequacy formulates the most important condition of correctness of scientific theory. Petrażycki, working in the style of traditional logic, did not uses (1), but a form (2) Every S is P , where S is a subject-term and P – a predicate-term. However, both express class-concepts in the outlined sense. I will denote relevant classes by bold capitals, in particular \mathbf{S} and \mathbf{P} ; I will use common notation for relations between sets, for instance inclusion (\subset – strong inclusion, and \subseteq – weak inclusion).

Petrażycki characterizes adequacy negatively, that is, by pointing out, when a theory (I recall that even a single general statement can be a theory) is not adequate. Let T be a statement pretending to be a theory. Petrażycki [5, pp. 19-20]:

A theory may be inadequate either (1) because the predicates are related which are too narrow; (2) because the predicate is related to a class which is too broad. [...]. Inadequate theories of the former type may be said to “limp”, those of the latter to jump. Science should admit adequate theories only. [...]. Often something predicated of a narrow class turns out to be true of a broader class: the theory then “limps and we must to re-fashion it by selecting the concept of a genus – not of a species as been done tentatively – as the logical subject. [...]. If it turns out that the theory “jumps”, we must cut it down by selecting a class concept – appearing as a species of the one we have already tried – as the logical subject.

The statement ‘All cigars are subjected to gravitation’ is an example of a “limping” theory, but the sociological assertion that all social phenomena are determined by economic factors, illustrates the case of “jumping” theories. Returning to the problem of class-concepts, their forming as good notions strongly depends on theories. Thus, we check the quality of concepts by investigating their behaviour in theories, particularly by observing whether they lead to “limping” or “jumping”. Petrażycki assumed that the reality is ordered by the relation species/genera and hence, his recommendations that improving inadequate theories consists in cutting species to genera or broadening in the reverse direction.

Tadeusz Kotarbiński [3, p. 499] (this chapter also contains historical remarks on the concept of adequate theory) gives the following characterization of adequate theories:

Petrażycki exhorts us to build adequate general theorems. He means, subject-predicate theses able to satisfy the following condition. Each such thesis ascribes [...] a property to a set of all past, present, future and possible objects, provided that such share a defi-

nite property specifically common to them. It ascribe to them not only correctly, but also reasonably, in conformity with the methods of correct foundations of connections between properties with respect to logical or causal nexus. The property so ascribed must also be exclusively of the elements of the class under discussion, which is the criterion of adequacy. Hence, such and only such a scientific theory is adequate which predicates neither too narrowly nor too broadly, but simply, but simply as to required; this can be guaranteed only in the founding of the connection between the content of predicates and the specific characteristic of the elements of the class under consideration (*qua* its elements).

Kotarbiński's summary clearly shows that there are for general issues related to the problem of adequacy of theories: (I) What is adequacy as such?; (II) How to achieve adequacy?; (III) How to test adequacy (every theory must be justified)?; (III) How to improve inadequate theories in order to make them adequate? My further remarks are mostly addressed to (I). I use some material published in [6] and forthcoming in [7].

The first issue consists in interpreting the sign * in (1). Using the equivalence between extensional and intensional understanding of classes, we can say that if $\mathbf{S} \subset \mathbf{P}$, a given theory limps (I omit quotes, because limping and jumping become technical terms). We can say that a property expressed by the predicate P applies to a broader class (set) than \mathbf{S} . For instance, the property 'being subjected to gravitation' can be predicated on a broader class than the set of cigars. If we have that $\mathbf{P} \subset \mathbf{S}$, a given theory jumps. For instance, the predicate 'being influence by economic factors' refers to narrower set than the scope of the predicate 'being a social phenomenon'. Taking $\mathbf{S} \subset \mathbf{P}$ and $\mathbf{P} \subset \mathbf{S}$ together, we obtain that a theory T is adequate if and only if $\mathbf{S} = \mathbf{P}$. The adequate is a theory 'All material bodies are subjected to gravitation' as well as a theory (it is a controversial claim, but let us take it as granted) 'All elements of law are emotions in which rights and duties are correlated'. Adequacy of theories is a stronger condition than their truth. Each limping and adequate theory is true, but not reversely, because there are true limping theories which are not adequate. On the other hand, jumping theories are false. By the way, there is an ambiguity concerning the word theory, because if we require that a theory must be true, jumping statements are not theories. Eventually, one can say that a jumping theory is true about a part of the class denoted by S . Petrażycki also distinguished absolutely inadequate theories, that simultaneously limping and jumping. They concern the empty scopes. I will ignore them in my further analysis.

Employing the equality $\mathbf{S} = \mathbf{P}$, (1) can be rewritten as

$$(3) \forall x(Sx \Leftrightarrow Px)$$

Thus, every adequate theoretical statement has a form of equivalence. However, this view provokes serious doubts [see: 4, for criticism of Petrażycki]. Whereas the implication $\forall x(Px \Rightarrow Sx)$ should be rejected as jumping and thereby not adequate, the status of the conditional $\forall x(Sx \Rightarrow Px)$ is more complex. Petrażycki's illustrations of limping are somehow extreme as the statement about cigars and gravitation. On the other hand, it is easy to formulate non-trivial limping implications, for instance, 'All planets move according to Kepler's laws' or 'Every man is a mammal'. Even if we say that such statements are fragmentary (partial), they are true and it would be difficult to question their theoretical importance in astronomy or biology. The implication $\forall x(Sx \Rightarrow Px)$, assumes that the inclusion $\mathbf{S} \subseteq \mathbf{P}$ holds. This dependence is consistent with the constraint of adequacy in Petrażycki's sense, but does not force it.

Contemporary methodological approach to scientific theories is different than that of Petrażycki. Theories are considered as axiomatic systems. This means that a theory T (the letter T refers to a set of sentences) is a set of a collection of axioms. Formally speaking, there is a set $X \subseteq T$ (usually, it is assumed that $X \subset T$) such that $T = CnX$ (I assume that X is consistent and $T = CnT$, that is, a deductive system). We can assert that the content of T is contained in its axioms. How to define adequacy of axioms of X . The best answer appeals to semantics. Since X is consistent, it has a model (it is also a model of T), let say, \mathbf{M} . Its universe can be identified with \mathbf{S} , but references of predi-

cates constitute \mathbf{P} (more precisely, properties and relations on \mathbf{S}). In this perspective, a theory T is limping if its model \mathbf{M} validates a broader class of truth than following from X , and jumping if this class is smaller.

From a purely abstract point of view, T can have various, even not isomorphic, models. However, in the case of empirical theories (I do not consider mathematical theories), we are interested in so-called intended models. Roughly speaking, an axiomatic X is adequate with respect to an intended (standard) model \mathbf{M} (usually, empirical procedures determine single models – if a theory T has a class of models, my considerations can easily be adapted) if and only if X generate all truths in this model and nothing more. Suppose that X is an adequate axiomatic of T and $B \in \text{Cn}X$. Consequently, B is less general than X . Thus, B is inadequate. On the other hand, the set of all consequences of X is adequate, because equivalent with a given axiomatic. Thus, T is adequate. In particular, the logical form of axioms is a secondary issue. They can be conditionals, equivalences, equations, etc. In other words, adequacy is a global property of theories, but not a local property of single theoretical statements.

The argument outlined in the last paragraph shows that the presence of inadequate statements does not result in non-adequacy of the entire theory. For example, consider Kepler's law as consequences of classical mechanics. They are not adequate in Petrażycki's sense literally taken. However, one can argue that axioms of Newtonian mechanics adequately characterize the set of material points. Under this supposition, this theory, understood, as the set of consequences of three principles of dynamics plus the law of gravitation is adequate – this property is derivative from its axioms. Clearly, there are some additional problems. Models qualified as intended function relatively to the stock of available knowledge. For instance classical mechanics is valid not absolutely, but in models admitting velocity much lesser than c . Hence, intended models have to be corrected and this fact seems to be essential in the development of science. This circumstance suggests that limping or jumping theories should not be considered as *a priori* as absolutely wrong, if they are suitable to generalization (correcting limping) or specialization (correcting jumping). By the way, Petrażycki himself pointed out that improving of theories proceeds by improving already available knowledge. From the point of view of models, generalization consists in extension of models, but specialization – in reduction of models. Both procedures can be strictly defined in model theory [1]. Finally, the property of adequacy is difficult to be achieved. Scientific theories, particularly in natural science, are usually limping, rarely jumping. In the humanities and social sciences, the situation is just reverse. Petrażycki was strongly influenced by peculiarities of fields similar to legal theory, where criticism in terms of adequacy is important. On the other hand, his ideas about adequacy and construction of concepts have relevance for abstract methodology of sciences.

References

1. Chang, C. C., and J. Keisler. *Model Theory*, Amsterdam: North-Holland, 1990.
2. Kotarbiński, T. *Elementy teorii poznania, logiki formalnej i metodologii nauk (Elements of Theory of Knowledge, Formal Logic and Methodology of Science)*, Lwów: Ossolineum, 1929; 2nd ed., Ossolineum: Wrocław, 1961.
3. Kotarbiński, T. *Gnosiology. The Scientific Approach to the Theory of Knowledge*, Oxford: Pergamon Press, 1966.
4. Lazari-Pawłowska, I. Tworzenie pojęć nauk humanistycznych według koncepcji Leona Petrażyckiego (Creating Concepts in the Humanities according to Leon Petrażycki), In J. Kotarbińska, M. Ossowska, J. Pelc, M. Przełęcki and K. Szaniawski (eds.), *Fragmenty Filozoficzne. Seria druga. Księga Pamiątkowa ku uczczeniu czterdziestolecia pracy nauczycielskiej w Uniwersytecie Warszawskim Profesora Tadeusza Kotarbińskiego*, Warszawa: Państwowe Wydawnictwo Naukowe, 1959, pp. 102-114.
5. Petrażycki, L. *Law and Morality*, transl. by H. W. Babb, Cambridge, Mass.: Harvard University Press, 1955; repr. in 2014.

6. Woleński, J. Prawdziwość, fałszywość, adekwatność (Na marginesie idei L. Petrażyckiego) (Truth, Falsity, Adequacy (Remarks of Leon Petrażycki's Ideas), In A. Bodnar, J. Wiatr and J. Wróblewski (eds.), *Prawo i polityka*, Warszawa: Państwowe Wydawnictwo Naukowe, 1988, pp. 369-377.
7. Woleński, J. Metodologia badań społecznych w ujęciu Petrażyckiego, *Studia Juridica* 2019 (forthcoming).

The Knobe Effect From the Perspective of Normative Orders

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Abstract:

The characteristic asymmetry in the attribution of intentionality in causing side effects, known as the Knobe effect, is considered to be a stable model of human cognition. This article looks at whether the way of thinking and analysing one scenario may affect the other and whether the mutual relationship between the ways in which both scenarios are analysed may affect the stability of the Knobe effect. The theoretical analyses and empirical studies performed are based on a distinction between moral and non-moral normativity possibly affecting the judgments passed in both scenarios. Therefore, an essential role in judgments about the intentionality of causing a side effect could be played by normative competences responsible for distinguishing between normative orders.

Keywords: intentional action, Knobe effect, Joshua Knobe, normativity, normative orders, normative competences.

1. Introduction

In this article we will look for an answer to the following problem: does the way of thinking about the intentionality of causing a side effect in morally negative situations affect the way of thinking about the intentionality of causing a side effect in morally positive situations, or vice versa? This question is interesting in view of the fact that the so-called Knobe effect is seen as a stable model describing human judgments about the intentionality of action [19], one of the reasons for this being that none of the numerous studies performed thus far have managed to falsify the effect. One should ask, however, what – apart from the findings of empirical studies – supports the thesis about stability of the model of intentionality attributions revealed in the Knobe effect. What theoretical arguments support this thesis?

2. The Attribution of Intentionality

Gilbert Harman [5] was one of the first scholars to discuss the difficulty related to the everyday use of the concept of intentional action. It is related to asymmetrical attribution of intentionality in causing an effect occurring in result of an accidental action. A broader discussion of this issue can be found in the works of Ronald J. Butler [3], who observed a tendency in judgments about intentionality that was difficult to explain despite the existence of analogical factors usually taken into account when such actions are analysed. In a new form, the problem resurfaced in studies performed by Joshua Knobe [10] which revealed a tendency that is now referred to in literature as the Knobe effect, or the side-effect effect.

In 2003, Knobe performed an experiment in which participants were randomly assigned a questionnaire describing one of the following scenarios:

The HARM scenario was as follows:

The vice-president of a company went to the chairman of the board and said, ‘We are thinking of starting a new program. It will help us increase profits, but it will also harm the environment.’ The chairman of the board answered ‘I don’t care at all about harming the environment. I just want to make as much profit as I can. Let’s start the new program.’ They started the new program. Sure enough, the environment was harmed. [10, p. 191]

The scenario was followed by two questions:

1. Did the chairman intentionally harm the environment?
2. How much blame does the chairman deserve for what he did?

The HELP scenario was as follows:

The vice-president of a company went to the chairman of the board and said, ‘We are thinking of starting a new program. It will help us increase profits, but it will also help the environment.’ The chairman of the board answered ‘I don’t care at all about helping the environment. I just want to make as much profit as I can. Let’s start the new program.’ They started the new program. Sure enough, the environment was helped. [10, p. 191]

The scenario was followed by two questions:

1. Did the chairman intentionally help the environment?
2. How much praise does the chairman deserve for what he did?

The study revealed that participants attributed intentionality much more readily when the side effects were negative (82%) than when they were positive (23%). Since the article was published, many comments have been made, and a number of studies have been performed in order to explain this phenomenon.

3. Attempts at Explaining the Knobe Effect

One of the standpoints which have become a permanent element in discussions around the Knobe effect is one which explains the observed asymmetries with moral factors [11]. This standpoint has

its advocates both among philosophers [14], [17] and psychologists [4], [12]. Correlations have been sought between intentionality attributions and moral judgments. A great deal of attention has been paid to the relationship between the attribution of intentionality and the attribution of guilt [13], [17], [15], [16], [18], [7], [6]. Some substantiations take into account the essential role of moral factors focused on norms and explained the attribution of intentionality with their violation [8] or intentional omission [20], [21]. Authors focusing on the role of moral arguments in explaining the observed phenomena paid less attention to subtleties related to categorisations or practical application of the concept of intentional action [2], [1], as they proved to be insufficient to explain the observed asymmetries [9], [19].

Analyses performed so far have either sought to provide an explanation which usually referred to one aspect of the issue under examination or described only some of the processes or existing correlations. It also seems that the very attitude to explaining the existing asymmetries is largely focused on subtle nuances in understanding the concept of intentional action. It is therefore interesting to use the category of prediction in order to understand the attribution of intentionality in causing side effects. In the cases of the asymmetry analysed here, it is predictions, or expectations held within the framework of a normative order embraced by the subject, that affect judgments about the intentional or non-intentional character of an action. It is worth noting that actions are based on cognitive predictions which cannot be reduced to intentions or designs [22]. Predictions are also related to the need to reduce normative tension and uncertainty. Therefore, the cause of a particular action may be seen as the need to minimize normative uncertainty [23, pp. 16-17].

According to Waleszczyński, in the search for an explanation of the asymmetry in the attribution of intentionality in causing morally positive or negative effects, it would be sufficient to point to the existence of two types of normativity: a moral and a non-moral one. This would explain most of the difficulties involved in the asymmetry discussed here. First of all, however, one should consider why any tension between the two types of normative orders should exist at all. Trying to explain the asymmetry in judgments about the intentionality of actions in the context of morally negative or positive effects, Waleszczyński has proposed the following solution [24]. With regard to the question about the intentionality of action, there are two normative orders, i.e. a moral and a non-moral one, in which different conditions apply for using the concept of intentional action. In the conditions of moral normativity, subject S_1 may be considered the originator of a good effect X_1 if effect X_1 was desired and foreseen, i.e. intended. In order to consider subject S_1 the originator of a negative effect X_2 , it is enough for the particular effect X_2 to have been foreseen by subject S_1 . In the conditions of moral normativity, the attribution of authorship is equivalent to intentional causation of a particular effect. It should be remembered, however, that there are various conditions for causing a morally good or bad effect within the framework of moral normativity. However, in the conditions of non-moral normativity, moral authorship (the causing of an effect which is endowed with certain moral qualities and conditions for judgment) should be distinguished from the intentionality of causing a particular effect. Therefore, in order to conclude that subject S_1 intentionally caused effect X_{1-2} , it is necessary to make sure whether or not he had the intention of causing effect X_{1-2} .

Taking the above distinctions into account, the explanation of the problem of asymmetry would be as follows: regarding the question about the intentionality of action, two normative orders overlap in which different conditions apply for using the concept of intentional action. When we are dealing with causing a good effect, the normative conditions governing the attribution of intentionality in both types of normativity coincide. In situations where the effect is morally negative, however, we may be dealing with a normative tension caused by different conditions for using the concept of intentional action, depending on the type of normativity. The distinction between two types of normativity provides a simple explanation of the asymmetry revealed in the Knobe effect. The solution proposed here relies largely on intuitions generally acknowledged in ethics.

According to Waleszczyński, however, the problem involved in the Knobe effect occurs at a certain metalevel and is related to normative competences, which enable us to distinguish between

various types of normativity. It is the normative competences which would determine according to which of the normative orders the problem is to be solved. Only after the normative order has been selected are “moral” competences or “cause-and-effect” competences employed, as applicable. The significance of moral competences would be particularly important in the case of passing judgments on the intentionality of action. When making such judgments, the conditions for applying the concept of intentional action corresponding to the two types of normative orders overlap. It is the ability to decide which type of normativity a particular question refers to and to identify the applicable conditions that would determine the judgments issued or the attribution of intentionality.

4. Discussion of the Sequence Hypothesis

If the division into two normative orders, a moral and a non-moral (cause-and-effect) one, is accepted, and considering studies on the Knobe effect performed so far, the following assumption should be made: participants who analyse the HARM condition scenario apply moral normativity, as in the case of a morally negative effect, they point to knowledge as the substantiation for the attribution of intentionality in causing that effect [24, pp. 122-4]. We do not know, however, what normative order is applied by participants who analyse the HELP condition scenario. The failure to attribute intentionality in causing a morally positive effect is substantiated by saying that the chairman did not want to or did not intend to cause such an effect. The reference to intentions behind actions and the assumptions we make in the substantiation suggests that when solving the problem, the participants could have been applying moral normativity, non-moral normativity, or both.

In order to check the above assumptions, we have decided to investigate the sequence hypothesis. The test consists in participants first being given one questionnaire, and another one after they have answered the first one. This way, we can see if the sequence in which the questionnaires are answered affects the occurrence of the Knobe effect. The sequence thesis has already been tested by Nichols and Ulatowski [19], but only to a limited extent. Their study was carried out online, and the participants could not correct their answers. The authors of the experiment did not reveal detailed results after the study was completed, but only stated that the sequence in which the questionnaires were answered did not affect the occurrence of the Knobe effect.

The matter does not seem to be as simple as this, however. If the participants prefer moral normativity when analysing the HARM condition scenario, and if we accept the principle that similar problems are solved in a similar way, the analysis of the HELP condition scenario will begin with preference for moral normativity. If this is the case, then the Knobe effect should appear in a “strong” form in both conditions, and individual judgments should be prevalingly asymmetrical. If, however, we do not know in reference to what normativity participants analyse the HELP condition scenario (there being three possibilities), then it will also be difficult to settle the preference of which normativity will come first when analysing the HARM condition scenario. If, however, the HELP condition scenario is not analysed at least by some of the participants in terms of moral normativity, then overall group results should reveal the Knobe effect in a “weaker” form, while individual results should be less asymmetrical.

Our experiment was designed as follows. The study was carried out in the form of a direct survey in which questionnaires in the Polish language were presented to passers-by encountered in the vicinity of Warszawa Główna, Warszawa Śródmieście, and Łódź Kaliska railway stations. The survey was carried out in two groups: Group 1 (HARM-HELP) and Group 2 (HELP-HARM). Each group included 31 participants. The participants were first given a questionnaire presenting the story with one condition, and after they completed it, the story with the other condition was revealed. Both stories were presented on the same page and were followed by a brief explanation on how to make corrections if a wrong answer had been given. When answering the questionnaire with the other condition, the participant could see both stories and his or her answers directly. The survey used the original Knobe stories [10], the content of which is presented in the *Attribution of*

Intentionality section. In the HARM condition questionnaire, participants had to answer one question: “Did the chairman intentionally harm the environment?”; in the HELP condition questionnaire, the question was: “Did the chairman intentionally help the environment?”. Answers were given on a seven-point scale, where “+3” meant “Absolutely Yes”, “-3” meant “Absolutely Not”, and “0” meant “Hard to Say”.

First, an analysis was performed within each group by looking at the answers of the same persons presented with the two questionnaire types (HARM and HELP). The first group began with the HARM scenario, and the other was first asked to complete the HELP scenario questionnaire. As the distribution of answers significantly differs from normal distribution, nonparametric tests were used in the analyses. The average and standard deviation for individual groups and conditions are presented in Table 1; results of the Mann-Whitney U test are presented in Table 2.

Table 1

Description of statistical results in HARM and HELP questionnaires by group

	N	M _{Harm}	SD _{Harm}	M _{Help}	SD _{Help}
Group 1 (HARM-HELP)	31	1,936	1,731	-1,387	2,108
Group 2 (HELP-HARM)	31	0,807	2,428	-1,065	2,265

Table 2

Results of the Wilcoxon test of differences between results within the same group in both questionnaire types

	Z	P	r Cohena
Group 1 (HARM-HELP)	-4,258	< 0,001	0,541
Group 2 (HELP-HARM)	-2,773	0,006	0,352

Test results of analyses using the Wilcoxon test show that in both groups the answers were asymmetrical. The effect size for Groups 1 and 2 were large and average, respectively. The difference seems to be greater in the group starting with the HARM scenario. To see if this difference is statistically significant, differences were calculated for each individual, and both groups were compared using the Mann-Whitney U test. The results are presented in the table below.

Table 3

Results of the U test comparing differences between results in the first and second questionnaire within the groups

	Z	P	r Cohena
Test U Manna-Whineya	-5,193	< 0,001	0,660

The observable difference proves to be statistically significant, and the size effect of the sequence in which the questionnaires were answered is large (which means that when the HARM scenario is analysed first, the Knobe effect is greater). Finally, to see if the differences occur in both study conditions or in only one of them, the results of each group in the HARM and HELP scenario were compared. The results of this analysis are presented in Table 4.

Table 4

Results of the U test between the groups separately for Harm and Help scenarios

	Z	P	r Cohena
Condition HARM	-1,776	0,076	0,226
Condition HELP	-0,488	0,625	-

As can be seen from the results presented above, no statistically significant differences were observed. The statistical tendency in the case of the HARM scenario suggests, however, that if a larger sample were tested, the statistical difference would probably be significant.

Final individual answers in terms of asymmetry were as follows. In Group 1 (HARM-HELP), asymmetrical answers represented 61.3%, symmetrical answers accounted for 19.35%, including four “Yes’s” and two “No’s,”; answers with one “0”, meaning “Hard to Say”, represented 19.35%. Three persons used the option to change their answer. Two persons changed their answer from an asymmetrical one to a symmetrical one, with one “0” answer. One person changed his or her answer from a symmetrical to an asymmetrical one. In Group 2 (HELP-HARM) there were 41.9% asymmetrical answers and 45.2% symmetrical answers, including five “Yes’s”, seven “No’s”, and two “0s”, while answers with one “0” represented 12.9%. Just as in Group 1, the option to change the answer was used by three persons. Two persons changed their answer from a symmetrical one (including one with two “0” answers) to an answer with one “0”. One person changed his or her answer from a symmetrical to an asymmetrical one.

5. Summary

An analysis of the findings suggests that in spite of the occurrence of the Knobe effect in group results, a statistical difference exists between the two groups. Individual results are interesting as well. In Group 2, symmetrical answers were more frequent than asymmetrical ones, and compared to answers in Group 1, there were twice as many. As the sample was not large enough, a more in-depth statistical analysis of this aspect was not possible.

The study we have performed and the results we have obtained suggest that the thesis about the existence of two normative orders and their impact on the attribution of intentionality in causing a side effect becomes more significant. Results in Group 2 proved to be interesting as asymmetrical answers only represented 41.9% of the total. This would mean that the way of thinking and analysing the HARM condition scenario is probably different from the way of thinking and analysing the HELP scenario. In the HARM scenario, one normative order, which Waleszczyński calls moral, dominates, while in the HELP condition scenario normative orders “compete” with one another.

As to the question asked at the onset of this article, namely, whether the way of thinking about the intentionality of causing a side effect in morally negative situations affects the way of thinking about the intentionality of causing a side effect in morally positive situations, or vice versa, the answer could be as follows. It is very likely that the way of thinking and analysing each of the scenarios depends on the normative order from the perspective of which each particular scenario or sequence of scenarios is considered. At the same time, the results suggest that it is moral normativity that decides the stability of the Knobe effect. Nevertheless, more in-depth empirical and theoretical studies are required in order to analyse the problems discussed in this article more thoroughly.

References

1. Adams, F., and A. Steadman. Intentional Action and Moral Considerations: Still Pragmatic, *Analysis* 64 (3), 2004, pp. 268-76.
2. Adams, F., and A. Steadman. Intentional Action in Ordinary Language: Core Concept or Pragmatic Understanding? *Analysis* 64 (2), 2004, pp. 173-81.
3. Butler, R. J. Report on Analysis “Problem” no. 16. *Analysis* 38 (3), 1978, pp. 113-4.
4. Guglielmo, S., and B. F. Malle. Can Unintended Side Effects Be Intentional? Resolving a Controversy Over Intentionality and Morality, *Personality and Social Psychology Bulletin* 36 (12), 2010, pp. 1635-47.
5. Harman, G. Practical Reasoning, *The Review of Metaphysics* 29 (3), 1976, pp. 431-63.
6. Hindriks, F. Control, Intentional Action, and Moral Responsibility, *Philosophical Psychology* 24 (6), 2011, pp. 787-801.
7. Hindriks, F. Intentional Action and the Praise Blame Asymmetry, *Philosophical Quarterly* 58 (233), 2008, pp. 630-41.

8. Holton, R. Norms and the Knobe Effect, *Analysis* 70 (3), 2010, pp. 417-24.
9. Knobe, J. Intention, Intentional Action and Moral Considerations, *Analysis* 64 (2), 2004, pp. 181-7.
10. Knobe, J. Intentional Action and Side Effects in Ordinary Language, *Analysis* 63 (3), 2003, pp. 190-4.
11. Knobe, J. The Concept of Intentional Action: A Case Study in the Uses of Folk Psychology, *Philosophical Studies* 130 (2), 2006, pp. 203-31.
12. Leslie, A. M., J. Knobe, and A. Cohen. Acting Intentionally and the Side-Effect Effect, *Psychological Science* 17 (5), 2006, pp. 421-7.
13. Malle, B. F., and S. E. Nelson. Judging Mens Rea: The Tension Between Folk Concepts and Legal Concepts of Intentionality, *Behavioral Sciences and the Law* 21, 2003, pp. 563-80.
14. Mele, A., and S. Sverdluk. Intention, International Action, and Moral Responsibility, *Philosophical Studies* 82 (3), 1996, pp. 265-87.
15. Nadelhoffer, T. Bad Acts, Blameworthy Agents, and Intentional Actions: Some Problems for Juror Impartiality, *Philosophical Explorations* 9 (2), 2006, pp. 203-19.
16. Nadelhoffer, T. Desire, Foresight, Intentions, and Intentional Actions: Probing Folk Intuitions, *Journal of Cognition and Culture* 6 (1-2), 2006, pp. 133-57.
17. Nadelhoffer, T. On Praise, Side Effects, and Folk Ascriptions of Intentionality, *Journal of Theoretical and Philosophical Psychology* 24 (2), 2004, pp. 196-213.
18. Nado, J. Effects of Moral Cognition on Judgments of Intentionality, *British Journal for the Philosophy of Science* 59 (4), 2008, pp. 709-31.
19. Nichols, S., and J. Ulatowski. Intuitions and Individual Differences: The Knobe Effect Revisited, *Mind and Language* 22 (4), 2007, pp. 346-65.
20. Paprzycka, K. Poznań Studies in the Philosophy of the Sciences and the Humanities. In A. Kuźniar, and J. Odrowąż-Sypniewska (eds.), *The Sciences*, Leiden, Boston: Brill Rodopi, 2016, pp. 204-33.
21. Paprzycka, K. The Omissions Account of the Knobe Effect and the Asymmetry Challenge, *Mind and Language* 30 (5), 2015, pp. 550-71.
22. Piekarski, M. One or Many Normativities? *Studia Philosophiae Christianae* 54 (1), 2018, pp. 5-24.
23. Piekarski, M. Two Arguments Supporting the Thesis About the Predictive Nature of Reasons for Action, *Studia Philosophiae Christianae* 54 (1), 2018, pp. 93-119.
24. Waleszczyński, A. Dwa porządki normatywne. Komentarz do dyskusji o intencjonalności działania, *AVANT. The Journal of the Philosophical-Interdisciplinary Vanguard* 8 (3), 2017, pp. 119-28.

**The Emotivism of Law.
Systematic Irrationality, Imagined Orders,
and the Spirit of Decision Making**

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Abstract:

The process of decision making is predictable and irrational according to Daniel Ariely and other economic behaviorists, historians, and philosophers such as Daniel Kahneman or Yuval Noah Harari. Decisions made anteriorly can be, but don't have to be, present in the actions of a person. Stories and shared belief in myths, especially those that arise from a system of human norms and values and are based on a belief in a “supernatural” order (religion) are important. Because of this, mass cooperation amongst strangers is possible.

Keywords: systematic irrationality, imagined orders, myths, behavioral economics, philosophy.

1. Introduction

The ethical system called emotivism takes morality as a subjective expression of the feelings and experience of an individual or set of individuals. Both morality as well as rights are about norms in a society or collective, and the state differs inasmuch as it is an armed form of respecting accepted values, identified and defined by actions and mass cooperation. Furthermore, axio-normative aspects overlap here, since the rulership can also act and create immoral law, and simultaneously, *through the passage of time*, it is not ruled out that an act judged as immoral by a community can requalify as being moral (as well as the reverse). It is not necessary for moral action to be captured by the legal apparatus, and in turn, for existing behaviors to not be considered in moral categories, but rather formal ones, which are legally sanctioned.

I accept Thomas Hobbes' claim that Leviathan, as a sovereign, is a power with a monopoly on the use of violence (punishment) in a specific community. As a development of this supposition, I suggest taking into consideration that the means of supervision and punishment are not the only ways to influence human decisions and actions. I do not have in mind the incentive potential of the reward, but the beliefs of people who are parties to the social contract expressed in the form of law. Mass cooperation between strangers is also motivated by extra-legal aspects. Therefore, one should look at the psychological and sociological aspects of the decision-making process, in which

intersubjectively communicative belief seems to be particularly important in a specific imagined order regarding the supernatural order of the world or metaphysics.

In the following deliberation I argue for the recognition of rationales and the value of subjective feelings and experiences of an individual for a reflection on rights in light of the ancient Greek philosopher and rationalist, Plato. From this I continue towards a theory of constructing emotion published by Lisa Feldman Barrett in 2017, while accenting the so-called “emotion paradox.” Next, I expand on the thesis on the predictable irrationality of humans, which was created by the behavioral economist Dan Ariely and on the psychological take of mental heuristics by Daniel Kahneman. In the following fragment, I present the definition of an imagined order according to Yuval Noah Harari. Finally, in summary, I discuss the covered issues with the aim to approximate the spirit of decision making.

2. Platonism and the Theory of Constructed Emotion

The justification of reasons or the value of subjective feelings and experiences of an individual towards the law in view of Plato seems to be incoherent with the great privilege of rationality in his philosophy. Especially rationality taken as keeping *distance* away from the body and pleasures, which borders on ascetics. However, this is somewhat shallow, since passion and mania play an important role in his philosophy, especially in managing objects of love, which provide pleasure. The subjective feeling and experiences of an individual should be united with the intellectual-spiritual principal of harmony, which leads towards the most real world of the pure idea of Beauty, Good, and Truth (*transcendentale*) [23, p. 327].

His metaphysical tripartite theory of the soul points towards a certain internal war amidst the parts of the soul exercising valor: the logical, the spirited, and the appetitive, as wells as towards the balancing of dichotomic aspects of the metaphysics of the embodied mind through methods such as physical exercise (the body) and practicing music (the mind as the soul), which are equally consequential, since they function analogously to the tautening and relaxation of a guitar string, which represents the soul. It is reason then, which controls with the help of the spirited, the appetites, in order to maintain just balance generating the valor of a person. Decisions made while only taking into consideration bodily pleasures, compose the character of a person, within whom the rational part of the soul is either too loose (unthinking) or too tight (dogmatic) or not in control, would not be praised, because the highest *rational* value is The-Good – The-True – The-Beautiful, and not hedonistic values. Plato’s program of exercising the parts of the soul (*paideia*) is μουσική (*mousike*), within which he made the distinction between writing stories μουσική δημῶδη (*mousike demodi*) and philosophy or metaphysics μεγίστη μουσική (*megisti mousike*) [23, p. 372]. The task was to teach the embodied soul how to discover balance after being shocked by ontological change (that is birth, understood as the crossing over from pure spiritual existence to entanglement with a body) and love the *transcendentale* already known *before* birth, just as music reveals harmony by tightening and loosening the string of an instrument.

Nevertheless, rejection of legitimate pleasures is an irrational behavior. The task of reason is not to deny emotion or desire, but to listen to emotions and the ability to reconcile them with reason. However, Plato wrote that the worst is human stupidity, and the ultimate stupidity is the lack of conformity in the individual as to pleasure and distress (emotions) towards rational beliefs. If cravings present reasons for taking any pleasant action and reason rejects them, not integrating them, or attempting to harmonize all elements in the soul, according to Plato, such a person suffers from the disease of nonsense.” [33, 688c-691d]. In other words, stupidity hurts. And the sensation of pain or pleasure, including intellectual satisfaction, is closely related to affect.

Expressions of feelings and experiences of the individual in terms of the ancient philosopher should be reconciled with the rights of πολιτεία (*politeia*, i.e. the State). Then ideas (concepts) and social reality are important, including metaphysics, fairy tales and novels. Once the laws and subjectively experienced emotions are agreed, the state can safely function. The metaphysical order (music of the spheres) provides protection against chaos and non-existence.

2.1. The Theory of Constructed Emotion

Emotions are susceptible to social and political control. It is worth pointing out the theory of constructed emotion by Lisa Feldman Barrett, who published her proposal to solve the so-called emotion paradox:

1. People intensely feel and experience emotions every day. We perceive the emotions of others and we ourselves talk about various emotions that we experience, such as joy, sadness, anger, surprise, falling in love, jealousy, etc. We perceive them as separate and discreet (strictly identifiable).
2. There is a lack of psychophysical and neurocognitive evidence for the existence of discrete states described in (1). Psychophysical and neurocognitive evidence points to the existence of affect in the brain and body; emotions are constructed by a pandemonium of brain circuits that cooperate simultaneously (internal conflict) [6], [7], [8].

Barrett's theory claims that emotions emerge in the present-moment of consciousness from more basic components, hence they are not created by innate and dedicated circuits in the brain. In the author's words: "In every waking moment, your brain uses past experience, organized as concepts, to guide your actions and give your sensations meaning. When the concepts involved are emotion concepts, your brain constructs instances of emotion" [7, p. 27]. Emotion is determined by a holistic process of cooperation between many brain circuits. The construction of emotion is conditioned also by interoception, concepts and social reality. An inner view of the human consciousness occurs at the end of such a process and is considerably limited. At any given time, the brain categorizes and predicts the present moment with the help of interoceptive feelings and cultural concepts of emotions. The argument for constructing emotions is based on the fact that affective impressions are more primitive to emotional labeling: categorization, experience and verbal description of any particular culturally constructed emotion. Despite the popularity of recognizing emotions as separate from each other, the affect generated by interoception is, however, gradual and out of focus, as with seeing colors. In the following, all references to emotivity by me is understood as Barrett does.

2.2. Platonism

Already from antiquity, philosophers such as Plato believed that law is a matter of social order and harmony, that is, the domain of reason, not pleasure, which is the domain of the body. Plato, however, does not reject the circumstance of the embodiment of the soul and indicates in the book of *The Laws* the possibility of conditioning a person, especially children, for normative recognition of law through the educational aspect of culture (*mousike*) in which a just person develops. The affective aspect is the key here. We read his recommendations for poet-musicians:

So in order that the soul of the child may not become **habituated to having pains and pleasures in contradiction to the law** and those who obey the law, but in conformity thereto, being pleased and pained at the same things as the old man, for this reason we have what we call "chants," which evidently are in reality incantations seriously designed to produce in souls that conformity and harmony of which we speak. But inasmuch as the souls of the young are unable to endure serious study, we term these "plays" and "chants," and use them as such, – just as, when people suffer from bodily ailments and infirmities, those whose office it is try to administer to them nutriment that is wholesome in meats and drinks that are pleasant, but unwholesome nutriment in the opposite, so that they may **form the right habit of approving the one kind and detesting the other**. Similarly in dealing with the poet, the good legislator will use noble and laudable phrases to persuade him –and, failing persuasion, he will compel

him—to portray by his rhythms the gestures, and by his harmonies the tunes, of men who are temperate, courageous, and good in all respects, and thereby to compose poems aright [27, 659d-660e].

What's more, when Plato speaks of magic in the form of "incantations" [39, p. 47] it is about singing, which is necessarily introduced into the State, because it is a tool to control people's attitudes and affective identification (pleasure) in harmony (conformity) with social reality, i.e. towards valor, and not bodily pleasure entangled in the dynamics of the coexistence of pleasure and distress. In addition, Plato recommends vigilance in the face of small, almost imperceptible changes in culture conditioning the emotive dynamics of human interaction with rights [33, 424d-e].

Despite rigorous censorship and control, the influence of propaganda may gain a certain, though limited, range, which is why one should pay close attention to forces normalizing certain ways of expressing, acting and making decisions, using rhetoric and appealing to emotions. If the perfect republic imagined by Plato would not adhere to this rule, the laws of that state should be regarded as symptomatic indications of a degenerated regime. The state legislator would attempt to combat changes in social reality and people's perception of concepts such as justice. Such a threat brings with them changes in emotional attitudes concerning the way of life and professed myths, different from the state narrative. It threatens with disorder and chaos. Then such a state would live like someone, who is in illness and follows their illness: "they will pass their lives multiplying such petty laws and amending them in the expectation of attaining what is best. [...] The life of such citizens will resemble that of men who are sick, yet from intemperance are unwilling to abandon their unwholesome regimen" [33, 425e-426a].

It is worth recalling that Plato did not approve of medical intervention and believed that a disease should develop and end by itself. He allowed for an adaptive selection that eliminates the weakest. The applied methods, which would be a kind of remedy for the disease, were treated as something disturbing the natural processes of life, including illness, as an external agent, which is called a *pharmakon*. Similar views are shared by people who believe in the righteousness of modern views about what is natural, such as anti-vaccine movements, GMO-free, and ineffective drug wars. On the other hand, the law cannot limit itself only to what enables categorizing and bureaucracy, i.e. writing [13, p. 43].

The exception is the *pharmakon* [30, 244a, 245a], [36, p. 212] of philosophers, noble lies in which cultural soil is prepared, developing the imagination of citizens about important concepts such as justice and commonly confessed myths that create social reality. This prevents 'following a disease' or the need to craft legislation that prohibits or prescribes ways to proceed. In this case, only newer laws would be passed, ineffective in modifying the decision-making process of people, changing only the ontological legal status of persons making decisions within illegal practices. Thus, instead of, for example, radically prohibiting abortion, a better legal solution (protecting law and order) is the transformation of cultural and conceptual reality.

Emotivism here refers to moral commands as an expression and extension of human affect and feeling, co-created by social reality and accepted concepts. These concepts are external to innate feelings and as information beings are susceptible to mimetic replication. Meme, understood both in Plato, as representation or imitation, and in the sense of Richard Dawkins and Susan Blackmore, as the basic cultural and technological units. Integrity is a significant phenomenon of the human psyche, but at the same time the psyche is not reducible to righteousness. Thus, decisions previously made by a person may be consistent with activities at a later time provided that the emotional reasons determined by the subjective states of the individual, social and conceptual reality are reconciled with rational considerations, taking into account arguments justifying the opposite. This is evidenced by the fact that people's behavior in some contexts, such as economics, is predictably irrational in the sense that we do not always act because of the ego's interest, despite rationality.

3. Systematic Irrationality and Mental Heuristics

Some methods and strategies developed in the field of behavioral economics have created problems with replication or did not result in success when used in uncontrolled conditions, e.g. in medicine, where attempts to encourage patients by doctors with specific impulses to follow the recommendations ended in failure [10]. Perhaps this is related to the inappropriate choice of methodology of science, especially in areas such as social psychology, as indicated by the work of economic behaviorists, including Daniel Kahneman, who responded to the replication crisis in 2014 [20], referring to the less strict methodological standards applied to researchers conducting replication. He also criticizes the lack of contact between the replicators and the authors of the original research. In addition, he points out that elements considered insignificant (such as font and word selection) have a significant impact on the behavior of people, including scientists themselves. Influences of non-substantive aspects of work in a highly rational environment are important, especially with the assumption that pure rationality of science is a myth. With this caveat, I will discuss the concept of systemic irrationalism and then the selected heuristics described by Kahneman.

Science is a highly rationalized system of cooperation between people. Despite this, human inclinations to make mistakes affect the prevailing paradigms. What's more, you can systematize these cognitive errors that we are subject to regardless of our knowledge of these mechanisms, as for example in optical or cognitive illusions. This is mainly because a significant part of the mind is not available to the self-conscious entity, and the unconscious part has much more control. In the words of neurophysicist David Eagleman: "who we are is largely independent of our choice" but ours "(...) the most basic drives are embedded in the circuits of our neurons and thus inaccessible" [16, p. 265]. The embodied mind itself appears emergent in the brain, which is composed of clusters of intersecting small subsystems with overlapping ranges of responsibility and actions [16, p. 165]. It is worth to question the hyper-rationality of a human being.

A person can be considered a being that makes decisions within Ariely's systemic irrationality. We deal with systematic irrationality if and only if there is a particular arrangement of elements with a specific structure that creates significance with extra-rational means. Unreasonable, unjustified, and often stupid behaviors and human decisions are predictable and regular, because it is a systematic or systemic form of irrationality. What's more, rationality is something that arises from irrational components, so rationality as such can be a phenomenon derived from systemic irrationality. Systemicity excludes senselessness and randomness, and systemically organized irrationality is subjected to a formal analysis in the form of scientific research, which may increase the possibilities of predicting and designing effective law in the Platonic spirit, taking into account that these rights can be included in the extramural system. Irrationality also means that transgression is just as possible as transcendence. Behavior motivated by the search for painful pleasure would be a behavioral and systemic problem. It is then problematic to co-create agency and law as a source of pleasure.

It should be noted that it is not only about the human being in the system, but about anything that can be designated by negating pure rationality. The unit is only part of the system, so it is not fully autonomous and there is no question of being distinctive in the nature of essential agency resulting from the spirit of a human. In addition, systemically irrational judgments are highly relative and entangled in cognitive biases. The feminist new materialism can be promising, to which I will return at the end of the article.

An important part of the brain's work involves retrospective narrative creation. Eagleman claims that "we learn, at least in part, about our own views and feelings by observing our behaviors" [16, p. 175]. When we justify these behaviors, the mind makes up the answer. Often, heuristics replace one (difficult) question with other (easy) questions, as Kahneman points out [21, p. 35].

An automatic system of brain components combined with conscious action does not necessarily aim at rational goals. In 1933, psychoanalyst Victor Tausk examined patients suffering

from schizophrenia and what was termed the name “influential machine” [38]. His patients complained that some mysterious device remotely controlled their thoughts, decisions and actions. Similar beliefs are observed today in people who believe in conspiracies, UFOs, certain plane crashes as caused by secret services or other organizations, e.g. Illuminati, Masons, etc. Tausk’s conclusion was that psychosis is not mumble and random statements, but often an ingeniously and artistically constructed bricolage of collective beliefs, preoccupations or aspirations. This is exactly what characterizes content available on the Internet and disseminated by new media. These contents, like the so-called Pizzagate scandal, are fictitious stories that have had real influence on the decisions of some voters. One person even dared to attack a pizzeria with weapons in hand to save children tormented by Hillary Clinton. Another example is Russian interference in electoral, legal and social campaigns with the help of new media and propaganda. It should be noted that these beliefs were based on loose associations and suspicions, not supported by credible evidence.

Once, the attitude towards people with mental disorders consisted either of glorification (craze is the gift of the gods) or condemnation (these demons possessed a human!). Cultural trance and ecstasy were often ritualized ways of reintegrating an individual with their community, environment or harmonizing internal conflict states. Today, not only the mentally ill are marginalized. There are also information bubbles (echo chambers), supporting crooked worlds and insulating them. Anyone who is not involved in the creation of meaning in a given way (often à la bricolage) becomes suspect and exposed to exclusion. Then, for example, in the comments on social networks appear judgements made by systemically irrational heuristics, generated independently of verifiable sources. This demonstrates in my opinion the urgency of understanding the mechanisms and functioning of systemic irrationality of a person immersed in a specific environment under whose influence they remain, but also who modifies it in a mutable way.

One of the mechanisms of systemic irrationality perceived in human decisions and actions is the use of heuristics. This is not new at all [35] Plato already wanted to recognize and understand aspects of the irrationality of the human mind. Ancient philosophy, including Plato's dialogues, investigate many issues related to the problems of modern science, including economic behaviorism. In his dialogues, Plato recognizes various disabilities of the mind and proposes ways to overcome them. Plato's dialogues include what contemporary economic behaviorism calls the confirmation effect as well as phenomena such as heuristics of accessibility, framing, fear of loss, heuristics of representativeness and anchoring

In addition to ancient philosophy, contemporary inquiries can explain certain aspects of human decision-making in a world full of stories, myths and constant changes. One of Victor Tausk’s arguments regarding the “influential machine” refers to confusion between the external (objective) and internal (subjective) world, which concerns the fabrication of the external cause of one's subjective and private thoughts, dreams and delusions. The modern world of the Internet, smartphones, expanded reality, virtual reality, televisions, radio and ubiquitous interactive computers blurs the boundaries between the external and internal world, between perception and reality. Reality is imagined as a gradual, non-sharp, non-binary, dynamic tool and technology that co-creates both the external world and our own imaginations.

4. Stories, Myths, and Imagined Orders

Yuval Noah Harari is conducting his research trying to answer the question: “How could people conquer the world and dominate the planet?” If one accepts that homo sapiens used to be a small animal along with other animals in terms of domination, Harari’s task is to explain what led us to our current situation on Earth. He makes a simple periodization of human history, in which he designates three parts or three basic revolutions [17]. The first is a cognitive revolution (70-30 thousand years ago), the second is an agrarian revolution (about 10,000 years ago), and the third is a scientific revolution (about 500 years ago). From 2 million to 10 thousand years ago, the world was inhabited by several species of humans simultaneously. The cognitive revolution took place between 70,000 and 30,000 years ago. At that time, people had the same cognitive abilities: they

thought and used the language the way we did. But the language itself is not a sufficient criterion, which can clearly distinguish a person from the background of nature. Each animal uses a code or communication method to describe the physical world. What can make a human stand out here is the way it is used.

One of the theories presented by Harari is that people's language has developed during gossiping. This means that the most important messages contained information about who you can trust. But Harari goes even a step further and claims that the most important feature of human language is the fictional function.

Mythology cannot exist without language. That is why it is worth realizing linguistic factors that may affect individuals' attitudes and beliefs. Especially when it concerns the ways of conceptualizing the law and modifying or maintaining the perceived social reality, as well as making decisions. It is worth exploring the issue of the relationship between cognitive revolution and language. We do not know what triggered the cognitive revolution which contributed, among other things, to the extinction of Neanderthals, the settling of the world by *homo sapiens*, creation of objects resembling works of art or jewelry, and the creation of social stratification (the emergence of trade, legends, myths, gods and religions). The most popular theory is that the reason for changes in the way of wiring the brain are accidental genetic mutations. Each animal has some kind of language, but what distinguishes *homo sapiens*? The theory of language flexibility states that the use of a limited number of sounds to build an infinite number of sentences of separate meaning. The theory of the rumor is that the method of sharing valuable social information. Here the language has a descriptive function that evolved to track the changing relationships between individuals. Harari draws attention to the fiction-generating trait, namely: "(...) the ability to communicate information about things that do not exist at all. According to the current state of knowledge, only representatives of *homo sapiens* can talk about hypothetical and counterfactual possibilities and tell stories that have been made up." [17].

The fiction function has several consequences. Namely: it allows (i) to present non-existent things, (ii) do it collectively and (iii) flexible cooperation with a large number of strangers. Rumors bond groups, exceeding their natural number, i.e. a maximum of about 150 units. It seems that this may correspond to certain features of myths. Myths develop the ability to cooperate in large numbers of communities, enable the modification of social structures immediately and establish cooperation between unknown units. They are the basis of a collective imagination created by stories in which people believe. Religious, national, economic and legal myths are created by stories invented by people. Values exist in the collective imagination of people and we can say that because we behave as if they did (for example the existence of limited liability companies).

Facts can be created by common myths, which is part of the concept that is fashionable lately, namely: post-truth. Post-truth is not a lie. An imagined reality is something that is believed in together and has a real impact on the world as long as the individual collective faith persists. It has been noticed that there are no evolutionary foundations for establishing cooperation between a huge, massive number of strangers, only the evolution of technology (e.g. the invention of writing) can be responsible for it, and the order of imagination can complement this lack. It is also worth remembering that some changes are not necessarily controlled by a lot of people, but by narrow groups. Harari claims that "the leading French lawyers were at the head of the French Revolution, not the hungry peasants." The imaginative orders that contain the common myths organize the imaginary reality, which makes it possible to make decisions and initiate activities without having to get intimately acquainted with others to organize a social hierarchy, which saves a lot of time and energy. The word cooperation usually has a positive association, but Harari emphasizes that cooperation based on the imaginary order has a character of a tool. Just like a hammer, which can be used for building, it also has destructive potential, in my opinion the imaginative orders are the proper object of the philosophy of technology, as social programs regulating people's behavior through systems such as faith in people's sovereignty, or marriage and the way of identifying and expressing emotive aspects. These are elements subordinated to the spheres of artificial instincts and their collection is called culture. Historically speaking, cooperation is a form of directing a

large network of people to oppression and exploitation, the history of humanity is saturated with injustice, and the basis for initiating actions based on social norms creates the confession of the same myths often combined into religious or quasi-religious systems.

Harari defines religion as a system of human norms and values, which is based on faith in supernatural order, which is not a product of human whims and agreements. On the basis of this supernatural order, religion establishes norms and values which it considers to be valid. It must be universal and missionary. Humanistic religions include liberalism, communism and fascism.

Let us compare Hammurabi's Code (1) with The Declaration of Independence of the United States of America (2):

1. "Behold The **righteous** laws, which Hammurabi, the wise king, established and (by which) he gave the land **stable** support and pure government. Hammurabi, the perfect king, am I. [...] The **great gods proclaimed me** and I am the guardian governor, **whose scepter is righteous** and whose beneficent protection is spread over my city. [...] that the strong might not oppose the weak, and that they should give **justice** to the orphan and the widow [...]" [22].

2. "We hold these truths to be self-evident, that all men are **created equal**, that they are **endowed by their Creator** with certain **unalienable Rights**, that among these are Life, Liberty and the pursuit of **Happiness**" [17, p. 138].

Both orders are rooted in and established by faith in supernatural universal and eternal principles (gods). If we were to modify the Declaration of Independence so that it would be compatible with modern science, it should read as follows:

3. We consider the following truths as obvious: that all people have **evolved in a different way**, that they are born with **specific variable qualities**, that these features include **life and autonomy in the pursuit of pleasure** [17, p. 139].

As I mentioned earlier, when a law cites such values as freedom, it should be realized that these are artifacts of the fiction-forming language. From the biological point of view, it is nonsense to talk about freedom, equality, rights, limited liability companies, and the claims about the freedom of people living in a democratic society and the powerlessness of people living in a totalitarian system are illogical. Happiness is, in turn, an emotion constructed partly by biological affect, consciousness, and partly internalized information about reality. The legal wording stems from the imaginative orders of people who, in the mechanism of the vicious circle, internalize the announced values as binding universally and universal principles of reality.

"Culture usually claims that it only prohibits what is unnatural. However, from a biological point of view, nothing is unnatural." [17, p. 184]. With Harari, I stress that there is no point in talking about violations of natural rights, because if it was possible, it would not be a natural law! Everything that is possible is, by definition, natural. No one can voluntarily travel faster than the speed of light or naturally fall up, violating the law of gravity. When there is a reference to the law of nature or its violation in the legal discourse, it is necessary to take such claims in brackets and consider what imaginary order they are based on. Mosquitoes, ticks, stones, volcanoes, oceans, trees in the Białowieża Forest, bacteria, fungi, etc. have no natural rights. This distinction comes from theology or shared myths and stories. Myths and fictions cause that from birth a person learns a given way of thinking, behaving in accordance with cultural patterns, desires of a particular thing and observing certain rules. "Every culture has its own beliefs, norms and values, but these are subject to constant change" [17, p. 202]. Attempting to reconcile internal contradictions in imagined orders drives the change. Since the French Revolution, equality and individual freedom have gradually been considered as fundamental values. Both values contradict each other, although according to Harari, "consistency and conformity is the domain of low volatile minds" [17, p. 204], because it recognizes conflict, cognitive dissonance and contradictory beliefs are responsible for creating thoughts, reappraisals, and critical eyes.

In addition, the laws of nature are stable and we believe that they are rather unchangeable. The imagined order, on the other hand, is constantly threatened by collapse, because myths disappear when people stop believing in them. Another example of an imaginary order used by Harari is the army. You cannot use force to maintain military order, so what keeps it together?

Harari claims that the order of imagination in which both the elite and the security forces believe, embracing values such as a supernatural eternal being (god), or other ways of identifying and organizing cooperation (honor) and engaging strangers who can be trusted (country).

Imagined Orders are characterized by the following traits [17, pp. 142-151]:

1. One cannot admit that the order on which society is based is a biased reality created by stories (about gods or laws of nature). Whereas the imagined order is rooted in material reality (what the natural sciences study).
2. Educate people about: fairy tales, dramas, paintings, labels, political propaganda, architecture, recipes, and fashion (the environment). Order is rooted in the material world (self-reflexive axionormative space). It shapes our desires. (even those we consider selfish).
3. The order is intersubjective. In order to change it, it is necessary to change the awareness of millions of people wholesale and there must be an alternative order in which to believe. Myths are the assimilation of an identical set of ideas on a topic.

5. The “Spirit” of Decision Making

Subjective impressions, feelings and experiences of a particular individual provide reasons for maintaining or disproving a given law, depending on the emotions experienced, such as pleasure or distress. This idea is not new at all, because Plato wrote a lot about this issue, including in the works of *The Republic* and *The Laws*. Barrett's contemporary theory allows us to develop ancient ideas. According to her, emotions are learned in so far as the way language is used is conditioned by the cultural environment. The way in which a given law is captured may be either in line with or in contradiction with cultural ideas about justice. Not only laws are modifiable, which is quite obvious, but also the beliefs of the individual, what propaganda, public relations or branding of particular parties, politicians, ideologies, etc. are trying to influence. A grassroots approach that can be considered as neoplatonic, takes into account the emotions of voters and participants of politics and political agendas in order to integrate individuals with a wider collective or community, as exemplified by the amazing election campaign of US senator in 2016, Bernie “Birdie” Sanders, who financed his campaign almost completely from the bottom up. Similar effects can be obtained by using social media. With their help, the current President of the United States, Donald Trump, influenced the emotional incentives of voters more than their rational motivations, involving, among others, neo-reactionary currents and the alt right (new fascism). One could say that his campaign was completely illogical in the sense that it was full of contradictions and yet it won him the election. Rhetoric and political arguments are strategies based mainly on the shortcomings of the human mind and the multitude of cognitive errors or heuristics. A good strategy built on these processes is the use of anecdotes that can be completely fictitious; Rumors are the fuel of politics, and myths are a construction plan of the political system of a given community.

It is not about rationality, but about rationalization. Feelings reign and reason is their servant. Plato suggests that the reverse situation is possible thanks to upbringing and education. Writing master's theses and philosophical dissertations as a rational undertaking should be pleasant, but if it is not, there is something wrong with our reason. Equally pleasurable should be compliance with the law (which comes from the norms of the community), and breaking the rules should be painful. The only person in history who, in my opinion, managed to achieve such a thing was Immanuel Kant. At the same time, I do not rule out that others do not exist with such a disposition, but I find it difficult to perceive it in the reality of publish or perish, where decisions are often external to the individual's will, which results in such significant consequences that the academic world is dealing with an epidemic of mental illness among PhD students. It seems to me that it is not such a *paideia* has been asked for, if it is to be Good for the State. Summoning Plato, it is ultimate foolishness, especially when wisdom is not love, but only a task. I remind you that at the head of the ideal state of Plato are the lovers of wisdom, philosophers. Politics should be pleasant. Perhaps it is not, but it is certainly full of emotions and madmen, which may be close enough to

generate various ideas and alternative proposals that are incoherent but necessary to change (instead of eternal law, which would be in my opinion unsuitable for changing cultural norms).

Society determines which emotions are acceptable at a specific place and time and how they can be expressed. Failure to comply with such expectations causes consequences in the form of punishment. The fact that the decision-making process is related to emotions does not mean lack of control. This problem is evident in the field of the science of cultural bricolage, creating artificial instincts, consisting of narratives about sex identity or gender. Legal decisions are conditioned by such aspects. Women are judged unfavorably if they are perceived as aggressive or in anger in situations that are justified in my opinion, such as loss of work, loss of respect, remuneration, etc. In turn similarly expressed men's emotion is usually perceived culturally as legitimate, adequate to the situation [7, pp. 218-252]. Such a husband in court judgments enjoys a reduced fare, because he behaves like a stereotypical man. The problem is that these stereotypes are social constructions, modern myths or fairy tales, but fortunately, such narratives can be changed by poets-musicians. Of course, there are no biological foundations for beliefs about the natural aggression of men or the modesty of women. Men are not natural stoics nor rationalists, and women are not inherently weak nor empathic. There is diversity among the entire population.

Another example of a linguistic procedure involving emotionality in seemingly neutral laws is the formulation of provisions regarding abortion in order to arouse feelings of guilt, regret, and remorse instead of relief and happiness. The law codifies emotional stereotypes, and emotional damage can be greater than physical damage. The problem with happiness (pleasures) lies in the fact that the creatures educated on the way of blind evolution – people – assign to their lives a meaning which perhaps is only an illusion, but they conform their illusions with the meanings attributed to the prevailing collective illusions. In the words of Harari: “As long as my personal story is in harmony with the stories of people around me, I will be convinced that my life has meaning and in this conviction I will find happiness.” [17, p. 475]. This idea was poetically expressed by W. H. Auden:

We are lived by powers we pretend to understand:
They arrange our loves; it is they who direct at the end,
The enemy bullet, the sickness, or even our hand [2, p. 249-250].

Individual decisions are not importable to it, the environment is a constitutive component of our agency and activity in the world. It is still puzzling for me to be “lived” by a force, which I understand as external forces that determine our agency. Usually, we think that the human mind is a type of ghost or some immaterial, intelligent being. This reason is invisible, but present as ghostly or only its trace. Of course, it's not about characters from fairytales or horror movies, but about memes and tremes, or replicators that have the ability to manipulate our thoughts in a way that is beneficial to these entities. These are stereotypes that tell us that a stranger is a legal threat to another spirit, a nation. It is a terrible battle of specters, and traces imprint on material reality on individual units. We are furious with fear, which can be either a punishment for stupidity or a tool for reintegrating a human being and for being compatible with each other.

Important aspects of pressure, resistance and other social movements are covered by the new feminist materialism. The intra-active concept of Karen Barad is at the forefront here. The premise of the concept is that matter is material and discursive, culture and mental habits reveal certain things and cover others, and agency is a changing phenomenon. Matter and meanings are entangled with each other and both are active. Discursive practices are not external to material phenomena [3, p. 152]. The dead matter (e.g. writing) dynamically co-exists and co-shapes meanings, and the meaning reverts to the matter which is animated and transformative, material-semiotic complexity fund single events. One should look at the processes of emergence of law and decision-making and the method of using matter (writing, technology, etc.), material-semiotic, ontology of law and the manner in which it is experienced (composed of matter, meaning or materiality and contexts). Then new materialism draws attention to the lawfulness of law as a processual, material and semiotic

development. This is the way we deal with phenomena such as the perceived level of national security, significantly changing who is perceived as a threat and who is not, how we solve the problem of trust, how the media of imaginary order spreads, what elements will be parts of a system that will be available in heuristic thinking mechanisms, what emotions will be important to us, etc.

These phenomena are like shadows in the myth of Plato's cave. Imagined reality is co-created by fictional language among animals that love gossiping. Culture (social reality), Concepts (Ideas) and subjective emotions (of the divisible individual – a human) are components of interaction (not in the relation of externality to each other, but co-constitutive), creating new, temporal social-emotional hierarchies in which we create discourses, materials and positions. We do not create anything ex nihilo, we rather try to rethink something based on various culturally available tools, such as relying on our own education to change the reality with our behavior. It is the mechanism of the vicious circle, which strengthens the beliefs that something should or should not be done, as in the difficulties associated with climate change.

Changes in the material social environment, i.e. new media and technologies, significantly transform laws and decision-making processes. More and more technologies appear to possess rational properties: they can learn, they are intelligent. Rationality reserved for a person is transferred to the domain of artificial intelligence, including legal services, e.g. [14] a lawyer robot providing free legal advice, specializing in the fight against fines. Intelligence is the ability to understand, learn and use your knowledge and skills in new situations. Such material-semiotic abilities are present among machines. Devices are able to assign a certain meaning to something by manipulating signs, designata, etc. They are already done by computers, but without a mysterious consciousness. The ability to know and appreciate oneself and the environment that is characteristic of a human is still the domain of matter.

New problems and religions include the emerging currents in Silicon Valley, transhumanism, projects connecting brains with each other, like Brainet or the inter-brain network, creating a collective mind. Anxieties troubling people, like the fear of death, motivate them to make such decisions as to make them the problems of engineering and technology, the material-scientific domain. Eternal life is now promised by such undertakings as cryonics in the Gilgamesh Project (2014) or SENS studies, which are forms of posthumanist ideology fantasizing about superhumans, it is the search for immortality and the path of *homo sapiens* into Homo Deus.

It is possible to apply such concepts as an imagined order, systematic irrationality, interaction, as well as old philosophical investigations to the analysis of decision-making mechanisms in various contexts of individual and social life. Not necessarily all human activities are preceded by making a conscious, purely rational decision, because the change of the system and the mechanism associated with heuristic thinking can trigger a change of decision. If it were different, we would not have to deal with phenomena such as seduction, advertising or marketing.

We share religious beliefs that are the foundations of lawmaking, but these are not religions understood exclusively as the largest official denominations, but also all ways of defining norms and values, such as faith in human rights, nation, money, communism, capitalism, liberalism, fascism, etc. These are also forms of faith taken in modern quasi-religions (e.g. posthumanism, dataism).

6. Conclusion

As part of the conclusion, I propose the following possible ways to continue the threads taken. First of all, it is worth exploring ancient philosophy in order to seek information on the problematic aspects of humanity. From the perspective of evolution, the people of antiquity are people who lived only yesterday. Human nature has not changed since then. You need at least a couple of thousand years. From the anthropological perspective, the challenges related to the law and emotions are just as valid for past cultures as for us today. Emotions are important elements of the way in which a person understands their surroundings and their own bodily and mental states. Law is not a field created by cool calculations. This is the sphere of human stupidity! Therefore, be

careful of manipulations, such as managing fear. Plato says that a person gets mad with fear. The way to solve this problem is to be brought up by the muses, especially through trance. It's about the reintegration of a person and their community. Today, instead of divine rage and ritual trance, we can reach for the recognition and acknowledgement of emotions as important components of social realities and political rights, to maximally integrate all members of society within the community, while limiting exclusion, including the intra-active technological-material sphere, as well as the one of semantic-significance.

Then, our decisions are exposed to cognitive biases and better explained by systemic irrationality. We are not angels or demons. Everyone has the potential to be the next serial killer or terrorist if systemicity puts emotive elements in such a way that this irrationality will be heuristically accessible. In this sense, it is worth analyzing the mental order in the legal environment and understand what inconsistencies may be. It is worth to design new imaginative orders (along with appropriate dissemination), which in themselves will be binding as rights under normalization and cultural expectations as to the other members of the community. A motivated small group of people is enough. Therefore, you can ask yourself, can we also design emotions?

Finally, considering the theory of construction of emotions, we should realize in the context of the emotive law that behaviors are anchored in the system of concepts. The concepts come from social reality, which has the potential to modify the neuronal (and genetic) human system. We learn from the environment and modify the environment at the same time. This means that symbols or ideologies have meaning, which can take the form of subtle symbolic violence, as in the case of gentle judgments against stereotypical men. It's access heuristics, which means that brain prognosis will be more likely to be experienced. The same applies to problems created by the creators of algorithms that are used legally and in the courts. It turns out that such technologies learn human's cognitive biases, including racism and sexism, and pose a threat to democracy and justice. We have a certain responsibility then, which is why the accountability of the process of constituting agency as such is important. In terms of changing ideas, it is worth expanding the system of concepts with the goal of changing the habits of thinking (combating stereotypes or the alliance of law with new codified stereotypes, stories or myths). Remember that culture programs the brain, which determines experiences and choices, including legal ones.

Philosophy in this area should become a philosophy applied in the sense that emotive legal ethics, the education of judges and the awareness that there is no such thing as pure rationality is urgent. You must develop the emotional competence of those who are responsible for the judgments of the law, as well as those who are the creators of the law. The law is not objective, and legislators should be interested in the fact that cultural and subcultural diversity is responsible for separate standards of emotional experience and expression of emotions.

References

1. Ariely, D. *Predictably Irrational*, New York: Harper, 2010.
2. Auden, W. H. In memory of Ernst Toller, In E. Mendelson (ed.), *Collected Poems: W. H. Auden*, New York: Vintage International, 1991, pp. 249-250.
3. Barad, K. *Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning*, Durham: Duke University Press, 2007.
4. Barad, K. Posthumanistyczna performatywność: ku zrozumieniu, jak materia zaczyna mieć znaczenie, In A. Gajewska (ed.), *Teorie wywrotowe. Antologia przekładów*, Poznań: Wydawnictwo Poznańskie, 2012, pp. 323-360.
5. Barad, K. Hauntological Relations of Inheritance: Dis/continuities, SpaceTime Enfoldings, and Justice-to-Come, *Derrida Today* 3.2, 2010, pp. 240-268.
6. Barrett, L. F. Emotions as Natural Kinds? *Perspectives on Psychological Science* 1, 2006, pp. 28-58.
7. Barrett, L. F. *How Emotions are Made. The Secret Life of the Brain*, Boston: Houghton Mifflin Harcourt, 2017.

8. Barrett, L. F., and T. Wager. The Structure of Emotion: Evidence from the Neuroimaging of Emotion, *Current Directions in Psychological Science* 15, 2006, pp. 79-85.
9. Bednarek, S., and J. Jastrzębski. *Encyklopedyczny przewodnik po świecie idei*, Wrocław: Astrum, 1996.
10. Carroll, A. E. (06.11.2017), Don't Nudge Me: The Limits of Behavioral Economics in Medicine, *The New York Times*, <https://www.nytimes.com/2017/11/06/upshot/dont-nudge-me-the-limits-of-behavioral-economics-in-medicine.html> (accessed: 25.10.2018).
11. Coventry University (08.11.2017), Religious Belief Not Linked to Intuition or Rational Thinking, *NeuroscienceNews*, <http://neurosciencenews.com/religious-thinking-not-rational-7902/> (accessed: 25.10.2018).
12. Dennett, D. C. *Od Bakterii do Bacha. O ewolucji umysłów*, transl. by K. Bielecka and M. Miłkowski, Kraków: Copernicus Center Press, 2017.
13. Derrida, J. *Pismo filozofii*, transl. by B. Banasiak, Kraków: Inter Esse, 1993.
14. DoNotPay, <http://www.donotpay.com/>, (accessed: 11.03.2018).
15. Dunber, R. G. *Gossip, and the Evolution of Language*, Cambridge: Harvard University Press, 1998.
16. Eagleman, D. *Mózg Incognito*, transl. by J. Mastalerz, Warszawa: PWN, 2012.
17. Harari, Y. N. *Od zwierząt do bogów*, transl. by J. Hunia, Warszawa: PWN, 2014.
18. Hobbes, T. *Lewiatan*, transl. by C. Znamierowski, Warszawa: Aletheia, 2009.
19. Jay, M. The Reality Show, *Aeon*, pobrane z: <https://aeon.co/essays/a-culture-of-hyper-reality-made-paranoid-delusions-true> (accessed: 25.10.2018).
20. Kahneman, D. (2014) A New Etiquette for Replication, <https://www.scribd.com/document/225285909/Kahneman-Commentary>, (accessed: 11.03.2018).
21. Kahneman, D. *Pułapki myślenia*, transl. by P. Szymczak, Poznań: Media Rodzina, 2012.
22. *Kodeks Hammurabiego*, transl. by M. Stępień, <http://www.pistis.pl/biblioteka/Hammurabiego%20kodeks.pdf>, accessed: 11.03.2018.
23. Kurylewicz, G. Szkic do filozofii muzyki według Platona, *Przegląd fizoficzno-literacki* 3-4 (40), 2014, pp. 319-330.
24. Mendelson Mendelson, Ariely Dan How to be attractive, *YouTube*, <https://www.youtube.com/watch?v=NaRoVup6jdg>.
25. Ośrodek Informacji ONZ w Warszawie, *Prawa Człowieka – Historia*, http://www.unic.un.org.pl/prawa_czlowieka/pcz_historia.php (accessed: 25.10.2018).
26. Pelosi, F. *Plato on Music, Soul and Body*, Cambridge: Cambridge University Press, 2010.
27. Plato. *The Laws, Plato in Twelve Volumes*, Vols. 10 & 11, transl. by R.G. Bury, Cambridge: Harvard University Press, 1967.
28. Platon, *Dialogi*, transl. by W. Witwicki, A. Lam (ed.), Warszawa: Verum, 2011.
29. Platon, *Eutyfron*, ibidem.
30. Platon, *Fajdros*, ibidem.
31. Platon, *Fedon*, ibidem.
32. Platon, *Menon*, ibidem.
33. Platon, *Państwo; Prawa* (VII ksiąg), transl. by W. Witwicki, M. Derewiecki (ed.), Kęty: Antyk, 2001.
34. Powszechna Deklaracja Praw Człowieka, http://www.unic.un.org.pl/prawa_czlowieka/dok_powszechna_deklaracja.php (accessed: 25.10.2018).
35. Romeo, N. (15.05.2017), Platonically irrational, *Aeon*,: <https://aeon.co/essays/what-plato-knew-about-behavioural-economics-a-lot> (accessed: 25.10.2018).
36. Rouget, G. *Music and Trance: A Theory of the Relations Between Music and Possession*, transl. by B. Biebuyck, Chicago: University of Chicago Press, 1992.
37. Schusterman, R. *Świadomość ciała*, transl. by W. Małecki and S. Stankiewicz, Kraków: Universitas, 2016.

38. Tausk, V. On the Origin of the “Influencing Machine” in Schizophrenia, *Psychoanalytic Quarterly* 2, 1933, pp. 519-556.
39. West M. L. *Muzyka starożytnej Grecji*, transl. by A. Maciejewska and M. Kaziński, Kraków: Homini, 2003.

Leon Petrażycki on Norms and Their Logical Study

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Abstract:

In this paper we discuss L. Petrażycki's idea of norm as a normative relation and show its repercussions in two perspectives connected to each other, in the legal theory in the framework of which it was originally introduced and where its role was straightforward, and in logic where it played a shadowy role of a fresh idea which in his expectation would have been the core of the novel logical theories capable of modelling reasoning in law and morals. We pay attention to the scholarly environment in which Petrażycki has proposed those ideas and to the unlucky fate of his academic legacy which is now being rediscovered.

Keywords: norm, normative relation, Leon Petrażycki, law, morals, logic of norms, deontic logic, John Stuart Mill, Wesley Hohfeld, Alexander Vvedensky, Sergey Povarnin.

1. Introduction

Leon Petrażycki (1867-1931) was an eminent Russian and Polish legal philosopher. He started his academic career in Kiev, in 1901 he became a professor of St Petersburg University and chaired the department of legal theory up to the revolutionary turbulent year of 1917 when he left Petersburg for Warsaw where he got professorship and a chair of the department of sociology of Warsaw University in 1919-1931.

Petrażycki was born to a Polish family in Vitebsk district, then the Russian Empire and nowadays Belarus, studied law in Kiev University, Heidelberg and Berlin. He was a person of

encyclopedic knowledge, spoke several languages and had a generous expertise scope ranging from medicine and psychology to philosophy and political science. His native language was Polish, he was educated in Russian and German and wrote and lectured in all the three languages. His lectures in St Petersburg University were very popular and attracted many students and extern intellectuals, despite his strong Polish accent and poor rhetorical skills, which made following them an uneasy task. He was an active member of the Russian intellectual and political elite in the first decades of the 20th century. As a legal philosopher, he was respected and honored by numerous colleagues and disciples in Russia and Europe. In 1917, the revolutionary events, subsequent military intervention and the collapse of the Russian Empire interrupted his academic and political career in its zenith and forced him to leave Russia for no return, which unluckily shrunk his legacy. He placed his voluminous academic archive in the University library where no its traces have been found so far. As he felt himself Polish, he chose Warsaw after fleeing from Petersburg. However, in Warsaw, during his later life he remained a Russian liberal intellectual and an internationally oriented Petersburg professor, often misunderstood and suspected of disloyalty by the local authorities, colleagues and the university management.¹

Petrażycki is considered one of the founders of the sociology of law, although that happened mostly indirectly through the legacy of his famous disciples Pitirim Sorokin, Georges Gurvitch and Nicholas S. Timasheff who prepared the first and so far the only English translation of some of Petrażycki's works [4]. Most of Petrażycki's papers and books were written in Russian during the Petersburg period of his life. He was a prolific author and contributed not only to various fields of law, but also to psychology, political philosophy, feminism, philosophy of science and logic. Influential in contemporary Russian legal philosophy, Petrażycki's legacy is still less studied than it deserves and remains largely underestimated [5]. It is hardly makes up a serious research issue to theorize how the legal philosophy in the middle of 20th century would have evolved or whether its key trends would much differed from those known to us today if Petrażycki's papers would have been widely available to scholars outside Russia in the first decades of the 20th century when they had been first published. What makes up such an issue is to find out which of Petrażycki's ideas absorbed in themselves the relevant research agenda of his time, how they pasted it into a substantially fresh framework and thus forwarded it so very much ahead that what would have promised to be a headlining conception instead remained unrecognized or unnoticed by his contemporaries as well as by later researchers, largely due to the unhappy circumstances. This paper sheds light on one such idea of his, which enjoyed many repercussions first in legal theory and later in some logical theories of norms. It is the concept of norm as a normative relation, central in his theory of law and morals, which he proposed in his treatise 'A Theory of Law and State in in relation to theory of morals' first published in St Petersburg in 1907, with revisions reprinted in Russian several times [6].

2. Petrażycki on Norms

In his treatise [6] Petrażycki outlined his psychological, or emotivist, theory of law, which influenced the development of legal thought in Russia and, through his disciples, had an impact on the Western legal thought. In line with his emotivist theory, Petrażycki suggested the definitions of the notion of norm in law and morals and outlined the classification of those norms. He believed that norms are based on the emotions which he treated as a kind of rational feelings in the human intellectual soul. According to Petrażycki, those emotions are agentive imperative-attributive relations, the structure of which varies depending on whether they belong to the legal or moral domain. The emotions emerge in human communications and they play central role in his legal theory, as they provide the ontological foundation for the social life in general. Those rational feelings give rise to social norms which deontologically motivate human conduct whenever something is claimed by an agent or is attributed to some agents in the communication among people. Moral norms originate in the attributive emotions, which impose unilateral obligations onto the agent who exhibits such attributive emotion, although those norms give rise to no claim

obligating any other agent, despite of the fact that they presuppose that there exist agents to whom something is attributed. Giving alms is an example of the attributive emotion of an agent which creates her moral duty to help the needy by means of donation.

Bilateral claim-attribution emotions generate legal norms which connect the active attributive emotion emerging in one agent with the passive claiming emotion in the other agent who thus becomes the beneficiary of what is attributed to her by the active agent. In contrast to the moral norm which although imposes a voluntary duty on an agent who is feeling the corresponding attributive emotion, but it has no imperative force and creates no obligation capable of connecting the two agents, the legal norm clearly refers to the beneficiary passive agent and gives rise to the corresponding imperative which constitutes the legal claim instead of a voluntary attribution in the moral norm.

‘From the established normative relation it follows that it is impossible without a representation of two agents: the one to whom the imperative function of the normative relation is addressed and who is legally obligated; and the other who is empowered or has the right on what is attributed to him and to whom is the attributive function is addressed. Those agents are called the subjects of the normative relation. The subject of the active function is the ‘positive’ subject of the right; the subject of the passive function is the ‘negative’ subject of the obligation’ [7, p. 257].

There are two combinations of the attributive claim and the imperative obligation which Petrażycki identifies as the two distinct groups of norms:

- (1) Unilateral obligatory imperative no-claim norms which impose obligations on one definite subject of the norm only, like ‘help your neighbor’, ‘respect your parents’ and other moral postulates;
- (2) Bilateral imperative-attributive norms consisting of claims and obligations, ‘which by means of obligating one agent secure that obligation with the other agent thus giving the latter the corresponding right or claim so that, according to such norm, the obligation is something the former owes to the latter’ [6, pp. 65-68].

While morals use complete formulations of norm explicitly pointing both to whom the attribution belongs and who has or may attribute it, legal codes seldom employ such complete formulations and often use norms abridged in the three following ways: leaving implicit the agent who is obliged by it and explicitly pointing to the claim and its subject, as in ‘*In the event of non-performance of the obligation in time, the creditor has the right to be reimbursed on the losses caused to him by the delay*’; leaving implicit the beneficiary and referring explicitly just to the obligation and its subject, as in ‘*In the event of non-performance of the obligation in time, the debtor is obliged to pay damages*’; or leaving unspecified both the active and the passive agents altogether and pointing to what has to be accomplished, as in ‘*In the event of non-performance of the obligation in time the damages are payed*’ [6, p. 66].

Diagram 1. Petrażycki’s classification of norms.

Normative relations		
Moral relations	Legal relations	
Unilateral attributions (imperatives)	Bilateral imperative – attributive	
	Imperative – attributive obligatory – claiming formulation	Binary abridged neutral formulation
		Imperative obligatory formulation
		Attributive claiming formulation
Complete formulation	Abridged formulation	
Moral norms	Legal norms	
Norms		

Petrażycki’s conception of norm is founded on the idea of the agentive relations of two kinds, the attributive taking something from one agent and giving that to the other one, and the claiming endowing the latter by something attributed to her by the former. Those relations originate in the

corresponding emotions which are the rational feelings in the agents' intellectual souls. The attributions can be voluntary or imperative depending on whether they concern moral or legal life respectively, but the claims which are the necessary parts of the legal norms can be imperative only. Depending on how, unilaterally or bilaterally, the two relations are constructed they give rise to the moral or legal norms, which then can be linguistically formulated in different ways. The concept of relation plays the central role in Petrażycki's legal theory.

In 1913, a famous American legal theorist Wesley Newcomb Hohfeld (1879-1918) introduced a classification of legal relations based on the idea that any legal relation consisted of two sides connecting its two agents, the subjects pertaining to those sides, in a certain way [8]. Whenever one of the two agents has a right to act in a definite way, has a power, or a privilege, then there always exists the other subject of that legal relationship, on whom it imposes the duty ensuring the right of the first subject, or the responsibility to execute her power, or the no-right or the disability. The Hohfeldian legal relations are binary with respect to agents and are asymmetric regarding the two relations they combine. They can be modelled with the help of formal notions of either inseparability which generates the correlatives between the two relations combined in one legal relationship, or incompatibility which gives rise to what Hohfeld called the opposites and what can be treated as the contradictory pairs of the relations [9].

Hohfeld was unfamiliar with Petrażycki's ideas, and Petrażycki knew nothing of the Hohfeldian legal analysis. The idea of relation provides the conceptual foundation in both Petrażycki's and Hohfeld's legal theories, although the ways how they elaborated this idea as well as the fates of their academic legacies essentially differ. Hohfeld's ideas became classics in the Western legal theory; they influenced the development of deontic logic and legal applications of the computer science. Contrary to that, Petrażycki's legacy remained largely unnoticed in this respect.

3. Logical Ideas of Petrażycki

There are two logical ideas relevant to our present discussion of Petrażycki's concept of norm as the normative relation: the notion of position, an intellectual entity responding to his intention for the refinement in the logical ontology, and the distinction between logic of descriptive and non-descriptive positions. Petrażycki thought that from the philosophical standpoint there existed just one object of the logical inquiry – rational feelings in the intellectual soul. He named them positions and maintained that once they were properly identified, this object would remain the same for any logical theory, existing and would be, and would prevent confusions and discrepancies in them.

At the turn of the 19-20th centuries, the ontological discussions were characteristic of the research agenda in many sciences, and the dispute over the ontological foundation of logic was a part of anti-psychologist and anti-irrationalist movement which later became known as the positivist turn in philosophy. With the help of his notion of position, Petrażycki purported to achieve two objectives: to define a novel logical ontology and to resolve the divergence between the two traditions of doing logic, in which the ontological foundations of logic had been treated diversely. The English-American tradition focused on the propositions, linguistic entities, while the continental tradition pursued the judgements, mental entities [10, p. 780]. With help of the distinction between the positions of these two kinds, he was going to demonstrate that the two different object areas of logical concern, the kingdoms of facts and of relations reflected by 'the objective-cognitive positions' and by 'the subjective-relative positions' respectively, would generate two different patterns of logical theories in which the ontological foundation of the inquiries would be one and the same but the basic concepts including the laws of logic would have to be revised.

According to Petrażycki, positions are atomic mental entities; they are the simplest indivisible units of meaning capable of generating molecular positions as complex units of meaning. *There are gods* is a simple position, *There are gods living on Olympus* is a complex position containing two simple positions. Interestingly, *Some gods live on Olympus* is a complex position, too, as it contains *There are gods* as a simple position along with another complex position *Gods*

live on Olympus, where the connective *is* itself generates a simple position. Positions can be true or not true or even ‘froth’ with respect to what their meaning conveys; they are expressed by means of propositions or judgements, simple or complex, and thus make them true or false. The initial bearers of the truth-values are positions which endow with those values the propositions or judgements as linguistic or mental entities expressing them [10, p. 782]. The way how Petrażycki portrays his new notion of position is vague regarding the ontological discrepancies between the two traditions this notion is meant to resolve. The positions resemble the judgements in the continental tradition, and there is no clue how to draw a clear distinction between the two notions, something one would expect to find given Petrażycki’s strong intention to resolve those discrepancies with the help of his notion of position.

The fresh idea about the position is that of a relation by means of which the propositions or judgements are generated as combinations of the positions. ‘There are different relations established among the various positions which are contained in the propositions and judgements’, Petrażycki explains. ‘To study those relations would be a fruitful topic’, he adds in the footnote [10, p. 783]. What he seems to have in mind here is that the existential import of the *is*-connective in ‘the objective-cognitive positions’ gives rise to what he calls the ‘positional logic of truth’ which pursues the correctness of inferences among the human rational feelings with respect to facts’ cognition. No such import is presupposed in ‘the subjective-relative positions’ on which ‘the subjective-relative logic’ focuses. Those ‘subjective-relative positions’ can be expressed either by the critical propositions or judgements regarding values, like in *It is a praiseworthy action*, or by the imperative ones where deliberations or norms are at stake, like in *It was a prohibited action* [10, p. 795]. Since ‘the subjective-relative positions’ are incapable of having the truth-values, neither of the two ways of expressing them has to do with the truthfulness or falsity.

The law of the excluded middle is the issue of Petrażycki’s special concern. He insists that in the novel positional logic, or the logic of the positions, this law is valid only in the logic of ‘the objective-cognitive positions’, and it governs only the principal, or ‘dominant’ contradictory positions but not the consequences inferred out of them [10, p. 784]. Despite his idea that the rules of logic, like the syllogistic rules *dici de omni* and *dici de nullo*, generally apply in the newly constructed logic of ‘the subjective-relative positions’, the law of the excluded middle does not. It is not quite clear what such logic would be given those limitations which on the one hand expand the scope of the logical inquiry beyond the truth matters, but maintain the applicability of the logical rules known as truth-related to that expanded scope, on the other hand. The only hint found in Petrażycki has to do with his idea of the rules’ reformulation along with the ontological refinement of ‘the subjective-relative positions’ [10, p. 798]. One might be willing to view those ideas as close to the non-classical logic but that would definitely be an exaggeration.

Petrażycki’s logical notes show that he had no intention of constructing a logic of such positions himself; he formulated a number of far from clear ideas of what such a logic should be as distinct from the logical theories he seems to have been exposed to but he never went beyond those sketchy remarks. His idea of creating a logic based on the notion of relation, whatever foggy it might appear, along with but distinct from what he called the traditional logic of truth sounds delphic with respect to his notion of normative relation in his legal theory. In those subjective-relative positions Petrażycki saw the object of inquiry in the novel logic which would pursue the rational feelings of values, norms and volitions as playing their decisive role in the practical sciences like medicine, education, politics and law.

4. Around Petrażycki’s Logical Ideas

Petrażycki wrote a book on logic in 1918-1919 while he stayed in Finland in between his Petersburg and Warsaw periods, but the book was never published and no traces of its manuscript have been discovered so far. All we know about Petrażycki’s logical ideas comes from his preparatory sketchy notes posthumously found in his Warsaw archive and published shortly after his death [11]. We refer to its Russian translation [10] here. These notes demonstrate that Petrażycki treated logic as a

general epistemological tool like many of his Petersburg colleagues in the first decade of the 20th century did and not as a collection of formal tools for creating and evaluating formalisms, which has become logic just a decade after that, when the Frege-Russell trend in what we today know under the name of symbolic logic and what many Petrażycki's contemporaries called logistic,² rapidly and radically changed the landscape of the logical inquiry.

Although Petrażycki saw logic as a necessary method for his philosophical scholarship, logic did not belong to his area of professional expertise. At the time when Petrażycki wrote his notes on logic in 1919-1921, his logical ideas have been already obsolete no less than he regarded obsolete the logic he knew, with the only exception of J. Stuart Mill's logical conception, influential in the XIX c. Russia. Petrażycki considered Mill's conception the most outstanding contribution to the field since Aristotle [10, p. 826].

Petrażycki's notes prompt that although he strongly felt a need for a fresh impetus in logic, he was unaware of the new developments in it taking place just next door to him. His notes show neither acquaintance with the Frege-Russell trend in the then logic, which was increasingly gaining influence among logicians and philosophers in the early 20-ies, nor with the results of his compatriots, notably with the logicians of the Lvov-Warsaw logical school from whose groundbreaking contributions that new trend has benefited crucially. Needless to say that the notes contain no mention of modal or non-classical logic, something one would have expected to find there given Petrażycki's aspiration for a logic of non-descriptive subjective-relational positions for analyzing norms, values and actions [10, p. 795].

Both of Petrażycki's ideas, the notion of position and the two kinds of logical theories the distinction between which was based on a newly defined ontological foundation, were connected to his idea of the subjective-relative logic which was consonant with the idea of relation spread in the air at the turn of the two centuries. The two ideas of Petrażycki seem to have been inspired by Mill's conception of logic of scientific inquiry. They followed Mill in his thrive for a refinement of the ontological foundations of logic as well as in how Mill treated the role of logic in the scientific inquiry with respect to guiding human conduct. According to Mill, human thoughts are a kind of mental feelings along with emotions, volitions and sensations from which the thoughts differ primarily in that they are always conscious feelings. Logic pursues those feelings inasmuch as they are conscious and rational [13, VII, 51]. Moral conduct has a dual nature. As a practical endeavor in its action-wise perspective, it belongs to the domain of art and thus falls outside of the domain of the scientific inquiry. However, since in its reasoning-wise perspective the moral conduct originates in those rational and conscious feelings, nevertheless it belongs within that domain to a definite extent. Deliberations over the material and social causes of human actions and over the feasibility of those actions' objectives are a part of science. Consequently, those reasonings have to be guided by the syllogisms and the rules of logic whenever they seek to be correct for the sake of the actions' efficacy [13, VIII, 944].

Logic of relations was an idea with the help of which logicians of that time were going to start constructing novel logical theories free from the overloaded ontological commitments and ready for wider practical application. Among those logicians were Petrażycki's Petersburg university colleagues Alexander Vvedensky (1856-1925) and his disciple Sergey Povarnin (1870-1952). Most likely he knew the both personally. Gurvitch, one of Petrażycki's disciples, mentioned Vvedensky as his teacher whose lectures in philosophy and logic he attended with great interest. Vvedensky was a professor of St Petersburg University at the same time with Petrażycki, from 1890 up to his retirement in 1923; he chaired the department of philosophy, published several papers on logic and was the author of the most popular logical textbook [14]. He lectured on logic and philosophy in many other higher education institutions in St Petersburg including The Raev Higher Women's Courses where Petrażycki also was a professor.

In his writings, Vvedensky never mentioned any special logic of relations. Unlike his disciple Sergey Povarnin who wrote a treatise on the logic of relations, Vvedensky made no attempts to develop a separate logical theory of any relation other than that of logical entailment which was central in his conception of logic as a science for evaluating reasoning and cognition as

correct or incorrect and for discriminating the former from the latter. However, he (and many other Russian logicians of that time) considered logic to have been a general theory of formal relations between propositions, according to which the logical laws were based on the relations of assertion and negation, so that the contradiction was understood as a relation between an assertion and a negation of the same proposition, the excluded middle – as the strong alternative relation between them, prohibiting contradictions in the correct reasoning, and the identity – as the relation between two assertions or two negations of the same proposition.³

Sergey Povarnin, the pioneer of argumentation studies in Russia, divided logic into three parts, epistemological, formal and discursive. The first of them played a guiding role in the scientific inquiry, the third did so in what concerned the communications among people over the output of that inquiry, and the second had to do with inference and proof, which evaluated the correctness of reasoning in the two. The formal part of logic also could be divided into two subsequent parts in which those inferential procedures were modeled in two different ways. One way was to view the entailment relation between premises and conclusion as the relation between the propositions understood as the bearers of the truth values. This was how the mathematical logic treated inferences in its truth-functional calculi. The other way of doing formal logic was the logic of relations, another kind of truth-functional calculus with the help of which logic pursued the inferences based on the conceptual relations among objects, like ‘bigger than’, ‘confined to’, ‘correlated with’, ‘available to’ and so on. Those relations could be binary, ternary or n -ary, symmetric or not, transitive and non-transitive, connexive, correlative or opposing and etc. In contrast to the mathematical logic where atomic formula was true whenever the descriptive proposition symbolized by the formula corresponded to the facts it conveyed, and false in the opposite case, in the logic of relations atomic formulas expressed the propositions describing certain relations among some objects, and it was those relations that became the propositional truth-bearers in the inferences. For example, let there be a set of objects $\{A, B, C, \dots\}$ connected by the binary relation ‘ ϕ is a cause of ψ ’. Then, if the premises *A is a cause of B* and *B is a cause of C* are true, out of them we can infer the true conclusion *A is a cause of C*. In his logic of relations Povarnin suggested constructing similar deductive primitive inferences based on one relation and the complex inferences based on different relation in the premises [17, 425 and ff].

Until recently the idea of logic of relations in a vein similar to what had been proposed by Povarnin and other philosophers in the beginning of the 20th century sounded outdated given how G. von Wright evaluated the progress the modal logic designed to model various relations among objects has made in the vein of the mathematical logic:

[T]he most exciting in logical theory after the second world war was the rebirth of modal logic... and it was only with the conception of logic, not as an alternative to Russell’s but rather as a ‘superstructure’ standing on its basis, that modal logic got a good start in modern times. This conception did not gain ground until after the Second World War [18, p. 19].

However, in the beginning of the 21st century those ideas of logic of relations, although differently put, entered the logical landscape again, this time - with the computer science in its search of the appropriate logical tools for modelling such relations among agents or objects as trust, security, access, control and alike [19].

5. Conclusion

Leon Petrażycki proposed the idea of norm as the combination of the agentive normative relations of attribution and claim. Because of the unhappy circumstances this idea did not live a long academic life as it deserved. However, its relevance is apparent in many scholarly repercussions it had, independent, as in the Hohfeldian analysis, as well as those which have been influenced by it indirectly through Petrażycki’s disciples. Those repercussions, whatever far away they may have

gone or reached, are still in the air in the contemporary scholarship, which makes the study of his legacy an ever persistent necessity. Petrażycki did not invent a novel logic; neither did he propose an explicit perspective for constructing one. His contribution to the domain of logic consists in his careful critical overview of its applications to the practical field of law and morals, which provides us with a brilliant sample of academic accuracy and devotedness.

References

1. Kojder, A. Leon Petrażycki's Socio-legal Ideas and their Contemporary Continuation, *Journal of Classical Sociology* 6, 2006, pp. 333-358.
2. Woleński, J. Leon Petrażycki o prawie i moralności, *Rocznik Polskiej Akademii Umiejętności Rok* 2016/2017, pp. 171-182.
3. Cotterrell, R. Leon Petrażycki and contemporary socio-legal studies, *International Journal of Law in Context* 11 (1), 2015, pp. 1-16.
4. Petrażycki, L. *Law and Morality*, transl. by H.W. Babb, N. S. Timasheff (ed.), Cambridge, Mass.: Harvard UP, 1955. Repr. with a new introduction by A. Javier Trevino, Transaction Publishers, 2011; Routledge, 2017. DOI 10.2307/2022017
5. Podgórecki, A. Unrecognized Father of Sociology of Law: Leon Petrażycki. Reflections based on Jan Gorecki's "Sociology and Jurisprudence of Leon Petrażycki." *Law & Society Review* 15, 1980/81, pp. 183-202.
6. Petrażycki, L. *A theory of law and state in relation to a theory of morals*, vol. 1-2, St Petersburg, 1907 (2000). (In Russian), Петражицкий Л. И. Теория государства и права в связи с теорией нравственности. В 2х тт. СПб, 1907 (2000).
7. Petrażycki, L. *Essays in legal philosophy*. St Petersburg, 1900-1903. In E. V. Timoshina (ed.), *Petrażycki L. Legal theory and politics*. St Petersburg, 2010, pp. 245-379. (In Russian) Петражицкий Л.И. Очерки философии права. В: Тимошина Е.В. (ред.) Петражицкий Л.И. Теория и политика права. СПб, 2010.
8. Hohfeld, W. N. 'Some Fundamental Legal Conceptions as Applied in Legal Reasoning'. *Yale Law Journal* 16, 1913 (1946).
9. Lisanyuk, E. W. Hohfeld and L. Petrażycki on norms and normative relations. *Izvestiya vuzov. Pravovedenie* 1 (318), 2015, pp. 112-134. (In Russian) Лисанюк Е.Н. У.Хофельд и Л.Петражицкий о нормативных отношениях и нормах. *Известия вузов. Правоведение* 2015 №1 (318). С. 112-134. Repr. as: Lisanyuk, E. W. Hohfeld and L. Petrażycki on norms and normative relations. A. V. Polyakov (ed.). *The Petersburg school of legal philosophy. Towards the 150th anniversary of Leon Petrażycki*. St Petersburg, 2018, pp. 178-197. (In Russian) Лисанюк Е.Н. У.Хофельд и Л.Петражицкий о нормативных отношениях и нормах. Поляков А.В. (ред.) *Петербургская школа философии права. К 150-летию со дня рождения Льва Петражицкого*. Санкт-Петербург, 2018. С. 178-197.
10. Petrażycki, L. New foundations for logic and classification of science. In E. V. Timoshina (ed.), *Petrażycki L. Legal theory and politics*, St Petersburg, 2010, pp. 775-856. (In Russian) Петражицкий Л.И. Новые основания логики и классификации наук (пер. с польск. А.В. Барабанова). В: Тимошина Е.В. (ред.) *Петражицкий Л.И. Теория и политика права*. СПб, 2010., с. 775-856. (A Russian translation of 11).
11. Petrażycki, L. *Nowe podstawy i klasyfikacja umiejętności*. Z rękopisu wydał Jerzy Finkelkraut. [Jerzy Licki]. Warszawa: Nakładem Towarzystwa im. Leona Petrażyckiego, 1939. (transl. into Russian as 10).
12. Ajdukiewicz, K. Logistic Anti-irrationalism in Poland. In W. Krajewski (ed.), *Polish Philosophers of Science and Nature in the 20th Century*, Amsterdam: Rodopi, 2001, pp. 241-250.
13. Mill, J. S. A System of Logic Ratiocinative and Inductive, Being a Connected View of the Principles of Evidence and the Methods of Scientific Investigation. In J. M. Robson (ed.), *The Collected Works of John Stuart Mill*, vols. 7-8, London: Routledge and Kegan Paul, 1974.

14. Vvedensky, A. *Logic as a part of epistemology*, St Petersburg, 1912 (In Russian, Введенский А.И. Логика, как часть теории познания. СПб., 1912).
15. Vasiliev, N. V. *On particular propositions, the triangle of oppositions and the law of the excluded fourth*, Kazan, 1910. (In Russian) Васильев. Н. А. *О частных суждениях, о треугольнике противоположностей, о законе исключенного четвертого*. Казань, 1910.
16. Bazhanov, V. A. Nikolai A. Vasiliev, His Life and Imaginary Logic Legacy. In V. Markin, D. Zaitsev (eds.), *The Logical Legacy of Nikolai Vasiliev and Modern Logic*, Springer, 2017, pp. 1-8. DOI 10.1007/978-3-319-66162-9.
17. Povarnin, S. Logic of relations. Its essence and meaning. In L. Tonoyan (ed.), *Collected works of Sergey Povarnin*, vol. 1., St Petersburg, 2015, pp. 339-472. (In Russian: Поварнин С.И. Логика отношений. Ее сущность и значение \\\ Тоноян Л.Г. (ред.) Поварнин С. И. Соч., Т. 1. СПб, 2015. С. 339-472.).
18. Von Wright, G. H. Logic and Philosophy in XX century. In Von Wright, G. H. *The Tree of Knowledge and Other Essays*, Leiden: E. J. Brill, 1993, pp. 7-24.
19. Van der Torre, L., and R. Van der Meyden. *Deontic Logic in Computer Science: 9th International Conference, DEON 2008*, LNAI 5076, Berlin-Heidelberg: Springer, 2008.

Notes

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1. For the biographical data see [1], for the academic evaluation of the legacy see [2], for the legacy's fate in the West, see [3].
 2. In the mid-war period *logistic* was the special term for the sentential calculi proposed in the Frege-Russell trend. The logistic was regarded a novel branch of rather mathematic than logic. The term *logistic* was coined by either K. Twardowski or by his disciple J. Łukasiewicz in their lectures in the first decade of the 20th century in Lvov University for discriminating what they called anti-metaphysical turn in logic from the older tradition in it [12, p. 243]. Using the new term for the new trend made it possible to reserve the traditional term *logic* for its traditional understanding as the epistemological part of philosophy. In that sense term *logistic* went out of use and was replaced by *logic*, or *symbolic logic*, after the WWII as the logistic eventually became the logic.
 3. Nikolai Vasiliev's 'imaginary logic', a forerunner of the paraconsistent logic, proposed around the same time [15], was an attempt to construct a logic with the nonexclusive relation between an assertion and a negation of a proposition [16].

Creative Reasoning and Content-Genetic Logic

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Abstract:

In decision making quite often we face permanently changeable and potentially infinite databases when we cannot apply conventional algorithms for choosing a solution. A decision process on infinite databases (e.g. on a database containing a contradiction) is called troubleshooting. A decision on these databases is called creative reasoning. One of the first heuristic semi-logical means for creative decision making were proposed in the theory of inventive problem solving (TIPS) by Genrich Altshuller. In this paper, I show that his approach corresponds to the so-called content-generic logic established by Soviet philosophers as an alternative to mathematical logic. The main assumption of content-genetic logic is that we cannot reduce our thinking to a mathematical combination of signs or to a language as such and our thought is ever cyclic and reflexive so that it contains ever a history.

Keywords: Genrich Altshuller, troubleshooting, creative reasoning, content-genetic logic.

1. What is Creative Reasoning?

If somebody wants to have his or her own business, (s)he is forced to make a huge number of different decisions concerning assessment of professional and personal skills of his (her) workers and partners, management, business plan, financing, marketing strategy, location, customer service, etc. Thereby the situation is much harder than it seems at first sight, because decisions should be permanent: any business runs into problems, some of them are everyday and typical and others are unexpected and serious. In the first case we know which decisions are to be taken and how they refer to suitable intelligent tools. In the second case we absolutely do not. Decision making in the latter case is called *troubleshooting* and the agent of this decision is called a *troubleshooter*. Quite often a business analyst is invited to help managers in troubleshooting.

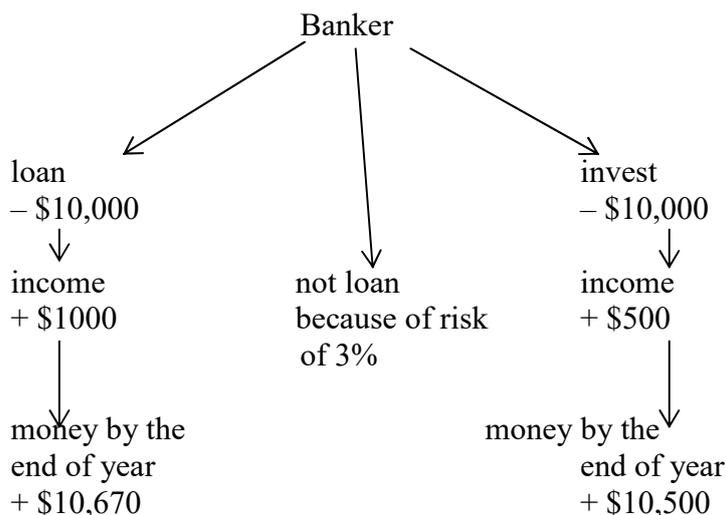
What do we mean by ‘typical’ problems? While precisely the same business-problems do not recur, if within our life-world we understand our business well, including its market, customers, and competition, we can make adequate permanent decisions concerning any area of our business that is currently in trouble. However, there are problems that cannot be solved with our background. They are untypical for us and we cannot explore solutions as usual. In this situation we can get a

fresh perspective or invite a troubleshooter as outside consultant. If the problem really is out of our competence, we should look for a troubleshooter for assistance, e.g. if the problem is technical such as the following:

Process plants operate about 28 days of the month to cover costs. The remaining days in the month they operate to make a profit. If the process is down for five days, then the company cannot cover costs and no profit has been made. Engineers must quickly and successfully solve any trouble when some problems that occur. Sometimes the problems occur during startup; sometimes, just after a maintenance turn-around; and sometimes unexpectedly during usual operation [13].

Nevertheless, there are situations that we can improve by our own means using just *creative reasoning*. Obviously, we can invite an outside troubleshooter in this case too, but it is important to learn how our solutions can work successfully. For instance, we wish to increase the product combination of furniture in our shop, but warehouse space is lacking. Then we should invent a method of individually supplying furniture for each concrete client. Or let us consider another example. Somebody is a political adviser who wishes to supply his client with a political promotion at the time when it is still or already prohibited. One more example from logistics: we wish to increase the volume of beverages being transported, having lowered thereby the transported volume in general. The idea of transportation of drink concentrate or its dry form became the creative solution.

Solutions, which we have already used, i.e. which have become a part of our habitus, are provided as conventional *data mining*. This means that we have some databases that are readily seen and clear for us and our solutions are prepared as logical reasoning on databases. Such data mining assumes inductive sets of data, namely data are regarded as a finite tree without cycles. For example, for financing a project a businessman needs to borrow \$10,000 for a one-year period. The bank can lend this money at 10% interest for one year or invest at 5% interest for one year. From experience the banker knows that 3% of such clients do not pay off the loan. The process of making decisions in the bank can be pictured as a finite tree without cycles. If the loan is given and repaid, then income is $((\$10,000 + 10\% \text{ of } \$10,000) - \$10,000) = \$1,000$. If the loan is not given, but this sum is invested, then income is $((\$10,000 + 5\% \text{ of } \$10,000) - \$10,000) = \500 .



As the logical rule for decision making the banker can use the maximisation criterion (selecting a variant with a maximum income), then from two variants

- 1) giving the loan = $(\$11,000 \cdot 0.97) - \$10,000 = \$670$;
- 2) not giving the loan = $(\$10,500 \cdot 1,0 - \$10,000) = \$500$.

the banker infers the solution to give the loan. This decision making has the form of data mining in the way of creating the inductive tree, i.e. a finite tree without cycles.

Usually, data mining for typical problems is presented by constructing trees as inductive sets. The necessary requirements for sets in data mining to be inductive are as follows:

- Databases should consist of a finite number of members (items);
- All possible relations should be presented by a finite tree without cycles.

Nevertheless, there are cases where databases for our decision making contain some unsolvable oppositions that hinder the construction of inductive trees, e.g. in databases there is a contradiction that makes it ill-structured: our system should have a property A to fulfill a useful function, and it should have a property non- A to avoid a harmful function and we are not able to select either A or non- A . In turn, we cannot here use conventional data mining at all.

Let us consider some cases of unwanted oppositions in databases: (1) the item A has a useful effect on the item B , but permanently or at separate stages there is a harmful back effect; (2) a useful effect A is also accompanied by a harmful effect B ; (3) a useful effect A on one part of B is accompanied by a harmful effect on its other part; (4) one useful effect is incompatible with another useful effect; (5) effect A on B is accompanied by a harmful effect on an environment or on the third object C ; (6) due to an effect A there is a modification of B such that the third object C has a harmful effect on A or B or their environment, see for more details [3].

We know that conventional data mining may be regarded as the building of inductive trees. In mathematics this is understood as algorithm. Beyond all doubt, the most basic notion of mathematics and physics are presented by algorithm. It plays a significant role providing, e.g., a correct (from the standpoint of logic) reasoning in mathematics and a well-defined measurement by rigid scales in physics. Its simplest definition is as follows: *algorithm* is a set of instructions for solving a problem. In computer sciences, algorithm is regarded either as implemented by a computer program or simulated by a computer program. In other words, the algorithm is reduced to the computer's process instructions, telling the computer what specific steps and in what specific order to perform in order to carry out a specified task. Thus, any conventional data mining may be simulated by the computer's process instructions.

In business and other forms of our activity quite often we face permanently changeable and potentially infinite databases. For such databases we cannot successfully use conventional data mining by applying algorithms. Nevertheless, we know how to argue and make decisions only algorithmically, i.e. on a fixed database sketched as an inductive set. What we can do then? We can appeal to *creative reasoning*, a kind of interactive computing when we go out of our initial fixed database. Let us illustrate this property by the Bible story, when the Pharisees asked Jesus: 'What thinkest thou? Is it lawful to give tribute unto Caesar, or not?' (*Matthew 25:17*). Here it is supposed there are just two variants of answer: 1. 'Yes,' then the outcome of such an answer causes discontent among the Jewish people, 2. 'No,' then the outcome of such an answer causes discontent among the Romans. As a database for decision making there is an opposition between the Jews and Romans and an effect A (tribute) which is favourable to Romans and defective to the Jews. Actually, any solution concerning the effect A is impossible without essential losses (either for Romans, or for Jews). Jesus becomes a troubleshooter and offers the following creative reasoning: 'Render therefore unto Caesar the things which are Caesar's; and unto God the things that are God's' (*Matthew 25:21*). Due to this reasoning Jesus leaves the initial database and offers a co-database, where Jews and Romans can be combined without losses for each other. The initial database was significantly extended and as a result some inference rules of the initial database were rejected. Another example of a new logic with creative reasoning: let us take the database (the agents John and Mike promise to give each other only gift loans, the agent John can give money only with profit earning) and answer the question of how the agent Mike can receive money from

John. There are different variants which depend exclusively on our creative abilities, i.e. on our ability to be a troubleshooter.

Let us consider the history of the coronation of Charlemagne (Carolus Magus, Charles the Great). According to ritual, the Pope should crown Charlemagne emperor. In the database of decision making there were two items which cannot be rejected: (i) coronation was necessary for solidifying power, therefore it should be conducted according to the ritual; (ii) for political reasons it was inadmissible that the Pope crown Charlemagne as that would show that the Pope is above the emperor. Charlemagne found an original output: at the moment of coronation he snatched the crown from the Pope's hands and put it upon his head himself.

Creative reasoning is ever preferable to conventional. Let us remember the myth of the Golden Apple of Discord. Eris (Discordia), the goddess of chaos, strife and discord was not invited to the wedding of Peleus and Thetis, the future parents of Achilles. Eris took great offence and threw a golden apple to the guests with an inscription: 'To the Fairest.' In relation to its possession there was dispute among the goddesses Hera, Athena and Aphrodite, each of them considered herself the fairest. The goddesses appealed to Zeus. But even the Great Thunder, the king of all gods and people, did not have the courage to decide the dispute of women in such delicate problem and cowardly entrusted it to handsome Paris, the Prince of Troy. The goddesses immediately began to bribe Paris: Hera promised to give him power and riches, Athena wisdom and military glory, and Aphrodite offered him the love of the fairest woman. Paris gave the apple to Aphrodite. As we see, Paris followed only conventional reasoning and was not creative. As a result, the initial contradiction was not solved and concerned Paris himself: on the one hand, Aphrodite helped Paris to steal the beauty Helen, on the other hand, this led to the well-known ten-year Trojan war and the death of Paris' people.

If Paris were a troubleshooter like Jesus, he would have made a creative decision. For instance, (i) he could say: "All three of you are Fairest!" and eat the apple; (ii) throw two more apples with the same inscription; (iii) call for the court of Apollo, the patron of arts, to absolve him, as an outside troubleshooter, of any responsibility. However, Paris thought algorithmically, not unconventionally.

There are methods for the development of creative and troubleshooting imagination. A good troubleshooter should be able to uncover the problems which are tucked out of sight and unsuspected. The actual problem may be hidden and presented only by a symptom of a condition that requires sweeping change. A troubleshooter has to know how to overcome the inertness of thinking in the solution of creative tasks.

In order to look at the object in a new fashion, i.e. to see the properties and possibilities of the object, which are not marked earlier, and by that in a new fashion to formulate task conditions, the Soviet engineer and inventor, Genrich Altshuller, the creator of the theory of the solution of invention tasks, offered the following [2] – [6]:

1. Mentally reduce the size of the object from the given value to 0 and answer the question of how the task is then solved;
2. Mentally increase the size of the object from the given value ad infinitum and answer the question of how the task is then solved;
3. Mentally reduce the process time (or the velocity of object movement) from the given value to 0 and answer the question of how the task is then solved;
4. Mentally increase the process time (or the velocity of object movement) from the given value ad infinitum and answer the question of how the task is then solved;
5. Mentally reduce the costs of the object or process from the given value to 0 and answer the question of how the task is then solved;
6. Mentally increase the costs of the object or process from the given value ad infinitum and answer the question of how the task is then solved.

For example, in the artificial pollination of a peanut the air stream from the air blower should transfer blossom dusts. But plants in the course of evolution have obtained an ability to be closed at a strong wind. And the weak wind badly carries blossom dusts. How can we solve this

contradiction? Mentally we reduce the process time from the given value to 0 and we notice that as a result we pass to the impulse pollination. Thanks to such breaking of stereotypes we come to a creative solution.

2. Content-Genetic Logic for Creative Reasoning

One of the first logical means for creative decision making were proposed in the theory of inventive problem solving (TIPS), in Russian: *teoriya resheniya izobretatelskikh zadatch* (TRIZ) which was developed by the Soviet inventor and science fiction author Genrich Altshuller (1926 – 1998) and his colleagues, beginning in 1946, see [1] – [6]. Altshuller notes that troubleshooting and creative decision making is aimed at avoiding first contradictions in databases. He claims that it can be done by means of a content-genetic logic created by him and called TIPS.

We know that troubleshooting is the process used to diagnose the problem (i.e. an appropriate contradiction in a database) safely and efficiently, to decide on corrective action and to prevent the contradiction in the system from reoccurring. Troubleshooting situations present symptoms showing where there is contradiction and should exhibit symptoms of deviations from the expected. Nevertheless, the symptoms may be misunderstood or might not reflect the real problem. According to Altshuller, the significant steps in defining a problem and in looking for creative decisions are as follows:

- Formulate the system's purpose, e.g. the main production (function) F of the system.
- Decide which main bodies participate (interact) in the system. For this purpose it is necessary to define 'basic functions' f_1, f_2, \dots, f_n (not less than two) and to add the function 'exterior circumstances.' Formulate 'supplying functions' $\varphi_1, \varphi_2, \dots, \varphi_n$ (not less than two) for each basic one. Add an axis of 'undesirable effects' for each function of the system. Enumerate a maximal quantity of undesirable effects at this axis.
- Explicate the problem which should be eliminated. The problem can concern either f_i (basic function), or F (the system's purpose). Define, where there is an inconsistency between parts or properties of that system (called the looking for 'clashing pair'). Formulate the inconsistency.
- Explicate the parts of the clashing pair which can be changed, and which cannot be changed. For any part which can be changed, it is necessary to formulate two opposite states: antonyms. The component part, A , should have the property, B , for situation a and anti- B for situation b .
- According to the main assumption of TIPS, in that part of a system which is not useful to us, i.e. which is diagnosed by us as an inconsistency, there is also a resource for its improvement and the inconsistency solution. In other words, in the inconsistency there is a possibility of its removal. It is a decisive stage in creative decision making in accordance with TIPS.
- Solve the inconsistency by using methods of TIPS.
- Analyze solutions and evaluate them from the point of view of increasing the degree of system ideality. Generate a new (more ideal) concept of system functioning. Modify purpose F according to the system mission.

For the dialectical removal of inconsistency (Hegel's *Aufhebung*) in any system many methods are used in TIPS. The main methods are as follows:

1. *The "Crushing Method."* If the system has deleted resources of its development or the system functioning is impossible because of some limitations, it is necessary to crush the system. For example, in nature a lizard leaves its tail in case of danger, and an earthworm recovers his body if it is split into parts. The ability of plants to be multiplied simultaneously by seeds, leaves, shanks, and roots raises their survival rate. In shops increasing the number customers is linked to crushing the activity of shop employees into independent operations: contacts with clients, work in warehouse, cashiers, etc. Many small announcements for advertising may be better than one big announcement.

2. *The "Dynamism and Controllability Rise Method."* System features should vary in the way they can be managed at each stage. If the system is 'rigid,' not immobile, it is necessary to make it movable or changable. For example, hooved animals graze as herds, but at the appearance

of predators herds run in all directions. To draw attention to advertising in streets publicity boards with varying pictures (prism vision) are used or advertising on public transport is used as it is seen by many more people than stationary advertising.

3. *The "In Advance Method."* For instance, to avoid infectious diseases we get in advance inoculations from poliomyelitis, measles, etc., which protects a person from these diseases. For the magnification of effectiveness of selling goods we can advertise before the appearance of new goods and organise the pre-order system.

4. *The "Now and After Method."* This is exemplified by conducting one action during pauses of another action. We can then change the frequency of action. For example, for stable survival plants have different times for germinating seeds during different seasons. Presenting information in the form of running "ticker-tapes" for breaking news and headline summaries can be another example. To grow some plants like garlic or rye in Siberia, one sows these cultures in winter. Also, it may be a payment of goods on credit. This usually attracts additional clients.

5. *The "Integration Method."* If the system has reached a ceiling, it can be united with another system. It is possible to integrate, in particular, homogeneous systems or systems intended for similar operations. In nature there is a symbiosis for a mutual amplification of two sorts.

6. *The "Diversification Method."* If the system has deleted development resources or there are exterior limitations, then it is possible to develop one of its subsystems. So, viruses have developed the ability to use larger cells to receive new virus descendants.

7. *The "Copying Method."* Instead of the complex, expensive, inconvenient system it is possible to use its simplified and cheap copies (duplicates). For example, the sale of small 'trial' consignments of new goods may show the value of real preferences.

8. *The "On the Contrary Method."* Instead of action satisfying the task conditions it is possible to make a back relation. We can make a dynamic part of the system motionless, and a motionless part move. For example, in some big companies it is accepted as the rule that managers for some time work at lower positions.

According to TIPS, the methods mentioned above fix paths of dialectical development of any system (natural, social, technical). As a result of the given development, inconsistency is eliminated by itself, and the system moves into a more ideal level. We should see these paths and route the system development.

Hence, the logic of creative solutions, offered in TIPS, cannot be formal. It is a variety of the so-called *content-genetic logic*. The Soviet logicians proposed it, continuing some basic ideas of the German philosophers Kant and Hegel related to their logic with the highest evidence – *Transzendentallogik* of Kant and *Dialektik* of Hegel. This logic is essentially characterized by the following three features:

1. *Thought as a cycle identified with reflexion and reflexivity*, i.e. thought is a cognitive activity to have cycles in the course of which a person gives himself or herself an account of what (s)he was doing, and how, and (s)he becomes aware of all the schemas and rules by which (s)he acted. The sole task of content-genetic logic (e.g. *Transzendentallogik* of Kant and *Dialektik* of Hegel) is then to make simpler the ordering and classifying of the corresponding schemas and rules of our reflexion. Everybody has reflexion allowing us to make creative decisions and hence each of us is a troubleshooter from time to time. Therefore

logic of the real basis for the forms and laws of thought proved to be only the aggregate historical process of the intellectual development of humanity understood in its universal and necessary aspects [i.e. in its reflexivity aspects—Sch. A.] [7].

2. While mathematical logic describes the inference rules (i.e. it understands thinking as a system of automatic inference), content-genetic logic understands *thinking as a permanent activity to be creative*, e.g. to invent something. This path to find out creative reasoning is called by the Soviet philosophers 'ascending from abstract to concrete' (the logic reflected in Marx's *Capital*). This permanent activity is initial and basic – it is a foundation of each social or psychological

activity. As a result, the genesis and evolution of thought, language, or inventions is examined as a revelation of schemas of content-genetic logic:

The whole history of humanity was correspondingly also to be considered a process of the 'outward revelation' of the power of thought, as a process of the realization of man's ideas, concepts, notions, plans, intentions, and purposes, as a process of the embodying of logic, i.e. of the schemas to which men's purposive activity was subordinated [7].

Thus, logic has to be a *history of science* in the meaning of Thomas Kuhn [9], TIPS methods only fix the main historical forms of inventions.

The subject matter of logic then proved to be those really universal forms and patterns within which the collective consciousness of humanity was realized. The course of its development, empirically realized as the history of science and technique, was also seen as that 'whole' to the interests of which all the individual's separate logical acts were subordinated [7].

3. The *thought-activity* studied in content-genetic logic cannot be totally algorithmized, but *may be partially technologized*. Therefore logic is understood as technical knowledge, but it is not considered a mathematical (deductive) knowledge. The schemas of that logic (e.g. schemas of TIPS) are not universal, they appear contextually within the concrete task or invention that the content-genetic logic is applied to.

The subject matter of logic was no longer the abstract identical schemas that could be found in each individual consciousness, and common to each of them, but the history of science and technique collectively created by people, a process quite independent of the will and consciousness of the separate individuals although realized at each of its stages precisely in the conscious activity of individuals (...) It was merely a matter of this, that the schemas of cultivated thought (i.e. of the processes taking place in the consciousness of the individual) should coincide with those of the structure of the science in the movement of which the individual was involved, i.e. with the 'logic' dictated by its content. If the schema of the activity of a theoretician coincided with that of the development of his science, and the science was thus developed through his activity, Hegel would attest the logicity of his activity, i.e. the identity of his thinking with that impersonal, universal process which we also call the development of science [7].

In addition to Genrich Altshuller [3], the following Soviet scientists also had a significant influence on forming content-genetic logic: Ewald Ilyenkov [7], Aleksandr Zinoviev [14], Gregory Shchedrovitsky [11], and many others. Adepts of content-genetic logic agreed that their logic has to be regarded as a true method alternative to mathematical logic, i.e. as a science with the highest evidence in the way of German transcendental philosophy. According to the Soviet scientists, logic of creative reasoning cannot be reduced to formal rules of a language. Content-genetic logic is based on scientific results of Leo Wygocki (Lev Vygotsky) (1896 – 1934) who showed experimentally that thought is not developed in parallel with speech in the general case:

The most important fact uncovered through the genetic study of thought and speech is that their relationship undergoes many changes. Progress in thought and progress in speech are not parallel. Their two growth curves cross and recross. They may straighten out and run side by side, even merge for a time, but they always diverge again. This applies to both phylogeny and ontogeny [12].

It follows from this that thought cannot be reduced to speech at all, that is human logic as a logic of creative reasoning cannot be reduced to a mathematical language. Therefore, this new logic called content-genetic logic has to be regarded as a study of the origins of knowledge (not as a study of ready-made knowledge by means of signs), i.e. it has to be considered a method in which the knowledge was obtained, because the method of knowledge construction affects the validity of that knowledge.

This idea shows the similarity between content-genetic logic and genetic epistemology, which was established by Jean Piaget (1968). The goal of genetic epistemology is to link the validity of knowledge to the model of its construction. But genetic epistemology, different from content-genetic logic, also assumes the use of the methods of formal logic:

Genetic epistemology attempts to explain knowledge, and in particular scientific knowledge, on the basis of its history, its sociogenesis, and especially the psychological origins of the notions and operations upon which it is based. These notions and operations are drawn in large part from common sense, so that their origins can shed light on their significance as knowledge of a somewhat higher level. But genetic epistemology also takes into account, wherever possible, formalization – in particular, logical formalizations applied to equilibrated thought structures and in certain cases to transformations from one level to another in the development of thought [10].

In symbolic logic, we directly identify thought with linguistic activity and logic with the analysis of language. According to the Soviet (and now post-Soviet) tradition of content-genetic logic, language (speech) is, nevertheless, not the sole empirically observed form in which human thought manifests itself, there is also an example of behavioral activity:

But, that being so, man's actions, and so too the results of his actions, the things created by them, not only could, but must, be considered manifestations of his thought, as acts of the objectifying of his ideas, thoughts, plans, and conscious intentions [7].

Self-development is an important ability of human thought that is reflected in studying creative reasoning by content-genetic logic:

The development of modern science is characterized not only by an unusually rapid accumulation of new knowledge but also by the fact that the principles and methods of scientific research have essentially changed and are continuing to change [11].

Thus, content-genetic logic was made as an alternative to analytic philosophy. The two main properties of *content-genetic logic* are (i) the *locality and limitedness of any science* and (ii) the *historical contextuality of scientific thinking*. On the other hand, the two main properties of *mathematical logic* are (i) the *interdisciplinarity of scientific research* and (ii) the *universality of scientific thinking*.

In accordance with the two properties of content-genetic logic, Altshuller's TIPS has no general algorithms for creative reasoning. It deals with contextual schemas that were detected in the development of natural systems (organisms, animal populations, etc.) or in the evolution of social systems (firms, corporations). In Altshuller's opinion, there cannot be symbolic logic of creative decision making at all, just content-genetic logic.

References

1. Altov, G., *And Then an Inventor Came* [И тут появился изобретатель]. Moscow: Detskaia Literatura, 1989 (in Russian).
2. Altshuller, G. S., *Invention Algorithm* [Алгоритм изобретения]. Moscow: Moskovski Rabochij, 1973.
3. Altshuller, G. S., *Creativity as Rigorous Science* [Творчество как точная наука]. Moscow: Soviet Radio, 1979.
4. Altshuller, G. S., Seliucki, A.B., *Wings for Icarus: How to Solve Invention Tasks* [Крылья для Икара: как решать изобретательские задачи]. Petrozavodsk: Karelia, 1980.
5. Altshuller, G. S., Zlotin, B.L., Filatov, V.I., *Profession to Look for the New* [Профессия— поиск нового (Функционально-стоимостный анализ и теория решения изобретательских задач как система выявления резервов экономики)]. Kishinev (Chisinau): Karcia Moldoveniaske, 1985.
6. Altshuller, G. S., Zlotin, B.L., Zusman, A.B., *Theory and Practice of Solutions for Invention Tasks* [Теория и практика решения изобретательских задач, Методические рекомендации]. Kishinev (Chisinau), 1989.
7. Ilyenkov, Ewald, *Dialectical Logic*. Moscow: Politizdat, 1974 (in Russian).
8. Jacobs, B., and Rutten, J., A tutorial on (co)algebras and (co)induction, *EATCS Bulletin* 62, 1997, 222–259.
9. Kuhn, Thomas, *The Structure of Scientific Revolutions*. University of Chicago Press, 1962.
10. Piaget, Jean, *Genetic Epistemology*, Columbia Univ. Press, 1968.
11. Shchedrovitsky, G., *Methodological Problems of System Research*. Moscow: “Znanie” Publishing House, 1964 (in Russian).
12. Vygotsky, Lev, *Thought and Speech*, 1934 (in Russian).
13. Woods, Donald R., *Successful Trouble Shooting for Process Engineers*. Wiley-VCH, 2005.
14. Zinoviev, Aleksandr, On the Working out of Dialectics as Logic, *Voprosy Filosofii*, No. 4, 1957 (in Russian).