MILLER'S AND TALIGA'S FALLACIES ABOUT VERISIMILITUDE COUNTING

Jiří ***Raclavský***

The present paper is a reply to Miller – Taliga (2008); reference to their points is made by §*n*), which is a criticism of Raclavský (2008).[1]

1. Although the problem of verisimilitude is a problem *about* scientific theories, *Miller's argument utilizes semantic notions* such as language and inter-language translation, thus it is in fact about semantic problems (*pace* §8); when solving a semantic problem, the use of clear semantic notions is not, *pace* §8, an 'obfuscating rhetoric'.

From the very beginning, Miller repeatedely uses 'translation' in connection with languages – he speaks about translation of theories between languages. One naturally understands Miller as meaning *inter-language translation*. On the very natural construal (respected by me in 2007, 2008), the translation of an expression E_1 of a language L_1 is E_2 of L_2 iff E_2 has in L_2 the same meaning as E_1 does in L_1 (the translation is thus evidently a semantic matter). Yet Miller repeatedely denies this and calls it unnatural (§4). The hypothesis in (2008) that Miller in fact means equivalence (between expressions which is based on equivalence of their meanings I explicate as Tichý's constructions) is confirmed also by §3. Thus *Miller means something other than it is conveyed by his own words*. His respective objections are therefore irrelevant, since they are misguided.

2. What is a theory? There are basically two options for us: a. it is a sum of sentences, or b. it is a sum of things expressed by these sentences, i.e. a sum of propositional constructions – concepts of propositions (as I suggested in Raclavský 2007, 2008, *cf.* for details).[2] The option b. is

[1] I cannot repeat here various theses and distinctions exposed in Raclavský (2008) (hereafter 2008) or already in Raclavský (2007) (hereafter 2007).

[2] A theory in the syntactic sense can be transformed into a deductive system; a theory in the objectual sense can be transformed into a deductive system in the objectual sense (my conceptual systems are close to such things because the disputed definitions are certain derivation rules). A theory in the sense of deductive system is not admissible for us because we have to construe theory as something true or false. Note also that sentences forming a sum can be put together by conjunctions – making thus one true/false whole; analogously for a sum of propositional constructions.

ORGANON F **15** (2008), No. 4, 477 – 484

more preferable because sentences are language relative items and we do not wish to say that the English 'It is hot and windy' and the Czech 'Je horko a větrno' are two different theories – we rather say that these sentences are English and Czech formulations of one and the same theory.[3] A few consequences: theories in the objectual sense cannot be translated (in the sense of language translation) because they are not expressions (of course, theories in the syntactical sense may be translatable from one language to another); theories in the objectual sense can be equivalent – when they determine the same proposition. A conservative as well as a non-conservative expansion of a theory (in the syntactic or in the objectual sense) was explained in details in the second part of 'Re-examination of Miller's objections to our approach' (2008).

Miller and Taliga still disagree (§4, §5) and they say there (and also at the end of §3) *that one theory can be expressed invariably in different vocabularies*. Then a theory could not be a mere sum of sentences, they seem to accept that theories are propositional constructions-concepts. But if they do so, they cannot validly object to (2008). However, they reject (2008) and explicitly claim *that 'one scientific theory may be based equivalently on many such [conceptual] systems'* (§8) – thus they seem to construe theory as a set of sentences after all.

There are two possibilities how to explain their *apparently incompatible construal of identity of theories*. In both cases one concludes that they do not respect identity criteria for theories held by theoreticians developing method of verisimilitude counting, especially those proposed by me. On the first explanation, *they have some other identity criteria for theories in mind*; *but they did not tell us which ones*. Using a sufficiently rich ontology (expressions, constructions, intensions/non-intensions) I do not imagine any other senseful candidate for theories; one may thus conclude that the first explanation of Miller's and Taliga's views is an improbable one. On the second explanation, however, one suspects that *they simply confuse identity criteria*. This hypothesis is well confirmed by their claims such as that *the theory* $T^{<}$ endowed with $<$ (but not with $\leq$) *and* $T^{\leq}$ endowed with $\leq$ (but not $<$) *are* '*the same theory*' (§4; emphasis mine) *but at the same time they are 'two theories* of partial ordering' (*ibid*.; emphasis mine). Hence Miller's and Tali-

[3] Functions from possible worlds, such as propositions, may be only denotata of expressions, since they are too course-grained to be meanings of these expressions. Thus the possibility to view a theory as a sum of propositions has not been considered (also for certain other reasons) by me.

ga's notion of sameness (identity) of theories is *a chameleonic one*. Having such vague (or even inconsistent) notion, their contribution to rational theorizing is largely irrelevant. For instance, one cannot be convinced by their criticism of Tichý's approach as 'quite useless for comparing theories' (the end of §4) when they assume a chameleonic notion of identity of theories due to which one can 'admit [as regards to one theory] formulations involving different primitives' (*ibid.*).

3. As I have discussed mainly in 'The fallacy behind Miller's argument' (2008), *Miller's argument is based on a deep fallacy, namely on the use of two entirely mutually incompatible premises*.

On *A-construal*, we have two theories T^{C1} and T^{C2} (in the objectual sense b.; analogies for their syntactical construal are easy to conclude), any of them is compound from concepts such as C_1 and C_2. C_1 and C_2 are basic concepts of two conceptual systems CS_{C1} and CS_{C2} respectively – but CS_{C1} does not contain C_2 and CS_{C2} does not contain C_1. Due to Raclavský (2007), the verisimilitude of T^{C1} can be found with respect to CS_{C1} (but not to CS_{C2} for it does not contain C_1 which is needed for verisimilitude counting); analogously, the verisimilitude of T^{C2} can be accomplished with respect to CS_{C2}.[4] Note that C_1 and C_2 are mutually 'independent'; it is *not* the case that one concept is *definable by means of the second* in any of CS_{C1}, CS_{C2}. Consequently, T^{C1} and T^{C2} are 'independent', thus *their degrees of verisimilitude typically differ*. Moreover, T^{C1} and T^{C2} are *not* – within any of CS_{C1}, CS_{C2} – *'intertranslatable' in the Miller's sense* (we have no 'translation rule'; even if we had have it, we would not apply it).

On *B-construal,* there is $CS_{C1(C2)}$ (or perhaps $CS_{C2(C1)}$ which I will ignore). $CS_{C1(C2)}$ utilizes an equivalence-'translation' rule ('objectual definition') due to which *C_2 is definable by means of basic concept C_1, i.e. C_2 is a derived concept of $CS_{C1(C2)}$*, thus C_1 and C_2 are mutually 'dependent'. Consequently, *T^{C1} and T^{C2} are 'translatable'* due to the equivalence rule, i.e. they may be equivalent ('the same'). Note that such translation is possible only when having $CS_{C1(C2)}$ (not when having only CS_{C1} or CS_{C2}). Now let the so-called truth deploy only basic concepts of $CS_{C1(C2)}$, signing it Tr^{C1}. One counts verisimilitude with respect to this truth and, of course, to $CS_{C1(C2)}$. To get the verisimilitude of T^{C1} (due to Tichý's method) is a straightforward matter. To get the verisimilitude of T^{C2}, however, one must *firstly convert* T^{C2} according to the equivalence rule in order to ob-

[4] Ignoring here the conceptual system CS_{C1C2} (a non-conservative expansion of CS_{C1} or CS_{C2}; *cf.* 2008) having among its basic concepts both C_1 and C_2.

tain the equivalent of T^{C2} which contains only basic concepts of $CS_{C1(C2)}$. When the result of such conversion of T^{C2} is just T^{C1}, then *its verisimilitude is identical (not different) with that of* T^{C1}.[5]

Miller's argument goes as follows: i. $\leq$ is definable by means of $<$, thus there are two equivalent ('intertranslatable') theories $T^{<}$ and $T^{\leq}$; ii. Tichý's method delivers distinct (even reversed) degrees of verisimilitudes for $T^{<}$ and $T^{\leq}$; iii. (conclusion) For $T^{<}$ and $T^{\leq}$ are 'intertranslatable' ('the same'), but their verisimilitudes differ, Tichý's method is thus wrong. Realize that Miller's statement i. implies that he uses as framework $CS_{<(\leq)}$ – for otherwise it could not be possible to 'translate' $T^{<}$ and $T^{\leq}$. But Miller's statement ii. implies that he uses $CS_{<}$ and $CS_{\leq}$ – using of $CS_{<}$ and $CS_{\leq}$ is necessary in order to get distinct verisimilitudes for $T^{<}$ and $T^{\leq}$. This amounts to the *inadmissible shift from B-construal to A-construal* (and *vice versa*).

One could be still confused: isn't there an 'unfitness' (*cf.* §8) of changes of $T^{<}$'s and $T^{\leq}$'s verisimilitudes when they are 'moved' from one conceptual system to another? This is not exactly so (even that certain dependence on conceptual systems is entirely legitimate). To understand it, investigate some rows of the verisimilitude-function (as it can be easily derived from 2007); it operates on triples ⟨theory, truth, conceptual system⟩ and delivers (for some of them – partiality) numbers (N_i):

$\langle T^{<}, Tr^{<}, CS_{<}\rangle \quad \rightarrow N_1$
$\langle T^{<}, Tr^{\leq}, CS_{<}\rangle \quad \rightarrow$
$\langle T^{<}, Tr^{<}, CS_{<(\leq)}\rangle \quad \rightarrow N_1$
$\langle T^{<} \Rightarrow T^{\leq}, Tr^{\leq}, CS_{<(\leq)}\rangle \quad \rightarrow N_2$
$\langle T^{\leq}, Tr^{\leq}, CS_{\leq}\rangle \quad \rightarrow N_2$
$\langle T^{\leq}, Tr^{<}, CS_{\leq}\rangle \quad \rightarrow$
$\langle T^{\leq}, Tr^{\leq}, CS_{<(\leq)}\rangle \quad \rightarrow N_2$
$\langle T^{\leq} \Rightarrow T^{<}, Tr^{<}, CS_{<(\leq)}\rangle \quad \rightarrow N_1$

($T^{<} \Rightarrow T^{\leq}$ means that $T^{<}$ is converted to $T^{\leq}$; rows where the conversion of Tr^i is needed are not diagrammed.) The absence of a functional value for some argument is caused by impossibility to find, e.g., the distance of $T^{<}$ from $Tr^{\leq}$ because $Tr^{\leq}$ does not contain $<$. Thus to get some verisimilitude degree of (say) $T^{<}$ one needs a suitable truth and a suitable conceptual

[5] It is not excluded that the truth contains derived concepts – but then the theories must be converted in order to contain the respective derived concepts.

system within which the truth is stated, e.g. $Tr^{<}$ and $CS_{<}$ or $Tr^{<}$ and $CS_{<(\leq)}$ (or $CS_{<(\leq)}$ and $Tr^{\leq}$ converted to $Tr^{<}$). Realize clearly, however, that the identity of $T^{<}$ (or $T^{\leq}$) is strictly given, thus in the fourth row, it is in fact $T^{\leq}$ what is measured (i.e. the fourth row is in fact the same as the seventh one; analogously, the eighth row is in fact the third one) – it is only our *imprecise* construal of the matter when we say that it is still $T^{<}$ when it is converted to $T^{\leq}$. From the *strict* point of view, therefore, *the distance (or verisimilitude) of certain theory from certain truth with respect to certain conceptual system – which can be a part of another system – is (if there is any) always the same*.[6]

There is perhaps *a distinct motive in Miller's reasoning* rather than a pure shift from B-construal to A-construal and back. But its entirely wrong result is the same: 'intertranslatable' theories having distinct verisimilitudes. The hypothesis is as follows. *Miller does not think carefully about conceptual systems*. He assumes that $T^{<}$ and $T^{\leq}$ are 'intertranslatable' in $CS_{<(\leq)}$ (using his chameleonic notion of identity, $Tr^{<}$ and $Tr^{\leq}$ are 'the same'); however, *when counting verisimilitudes of $T^{<}$ and $T^{\leq}$ he does not realize that he compares $T^{<}$ with the truth $Tr^{<}$, stated within $CS_{<}$ which is a part of $CS_{<(\leq)}$, but then he compares $T^{\leq}$ with the truth $Tr^{\leq}$, stated within $CS_{\leq}$ which is another part of $CS_{<(\leq)}$*. Note that this is *a direct violation of necessary condition for verisimilitude counting: choosing only one conceptual system (within which the truth is stated) for comparison of theories* as regards verisimilitude counting (it does not matter whether one chooses $CS_{<}$ or $CS_{\leq}$, or rather $CS_{<(\leq)}$ – but only one of them); I explicitly demand this condition already in 2007 (repeating it in 2008).

4. As we have seen already in their previous papers, *Miller and Taliga notoriously deceive their readers*. Since their respective claims are in fact false or simply misdirected, they do not make senseful contributions to the rational discussion about the problem.

a. A quite irremissible deception of theirs is to be found in §3: 'from the start, Tichý conceded that the B-reading was never intended (1978, note 4)'. The real truth: 'In the course of the discussion David Miller dis-

[6] One could derive that Miller's (and Taliga's) key fallacy consists in their confusion of $T^{<}$ and $T^{\leq}$ because they use their chameleonic notion of 'sameness' which disguises weak and strict identity of theories: when they compare $T^{<}$ and $T^{\leq}$ and speak about their sameness, they use a weak notion of identity (it is not the real identity); when they compare $T^{<}$ and $T^{\leq}$ and speak about their distinct verisimilitudes, they use a strict notion of identity (the real identity).

closed that the first [i.e. the metalanguage reading, A-reading] interpretation of his argument is the intended one' (Tichý 1978, 195, note 4); I cannot quote anything supporting 'B-reading was never intended', since there is nothing in Tichý (1978, 195, note 4) or in any other text by Tichý, Oddie or me that would at least partially justify such Miller's and Taliga's claim.[7]

b. Another remarkable deception of theirs: 'Tichý's method of defining the verisimilitude is applied only to sentences phrased in primitive vocabulary' (§2). The whole truth: I was very explicit about the conversion of theories composed of derived concepts to their equivalents deploying only basic concepts (2007, 2008) which has to be done when the so-called truth is (as it is usual) composed only of basic concepts. It is trivial to conclude that when the truth is composed of derived concepts, then Tichý's method is easily applicable to theories involving derived concepts (not only the 'primitive' ones).

c. Another huge deception of theirs: 'in the unnatural sense accorded to translatability by Tichý and his followers, the two theories [$T^{<}$ and $T^{\leq}$] ... resist mutual translation' (§4). The real truth: due to (2007, 2008), $T^{<}$ and $T^{\leq}$ are 'intertranslatable' in Miller's sense of the word; it can be done according to B-construal. *Cf.* also Tichý's claim: 'We can indeed extend language L_A by adopting definitions $m =_{df} h \leftrightarrow r$ and $a =_{df} h \leftrightarrow w$. In this extension of L_A, all the equivalence and intertranslatability statements made by Miller are true' (Tichý 1978, 194).

d. Another deception of theirs: 'Oddie (1986, § 6.3) admits that ... [$T^{<}$ and $T^{\leq}$] are 'correlated', and that verisimilitude … is 'not correlation invariant' (§4). The whole truth: Oddie argued there that a rigorous and materially adequate explication of the notion of verisimilitude (like many other notions) has to be correlation variant even if some items (e.g. two theories) may be – from some viewpoint – correlative.

e. Evoking Tichý's and Oddie's 'object-language/metalinguistic reading' (§2) is quite misleading as regards my objectual construal of theories, conceptual systems, etc. Recall that my main goal in Raclavský (2007) was to upgrade Tichý's approach from the simple type-theoretic to the ramified type-theoretic framework of Tichý (1988); this enables to grasp constructions directly, not *via* their linguistic representations. The

[7] One thus observes that this Miller's response to Tichý's 1978-criticism, Miller's first in the up-to-now history, is a wholly inappropriate one.

distinction 'object-language/metalinguistic reading' is then irrelevant, since it has only small affinity with my A-/B-reading.

f. When they say 'Raclavský, who fails to distinguish formalized languages from formal languages (2008, 4f.), is calamitously mistaken about Tarski's achievement' (§6, emphasis suppressed), they seem to presuppose (*cf*. also §7) that Tarski suggested a semantic definition of truth for both natural and formal languages.[8] The real truth is as follows. Tarski saids in the Introduction to Tarski (1956, 153) that 'With respect to [colloquial] language ... the definition seems impossible' (Tarski showed it in his §1). Then he said (*ibid*., 153): 'I shall consider exclusively the scientifically constructed languages … i.e. the formalized languages of deductive sciences' (his famous definition for such languages such as that of set theory is exposed and studied on pp. 165 – 265). Immediately after (in the Summary, p. 267) we read his debate with an imaginary philosopher who dismisses 'all formalized languages' as an 'artificial construction' contrasting with 'the one natural language–the colloquial language'. Tarski reminded us (*ibid*.) that 'the concept of truth … when applied to colloquial language ... inevitable leads to confusions and contradictions' – the philosopher who wishes to overcome this and 'pursue the semantics [including the concept of truth] of colloquial language with the help of exact methods will be driven first to ... reform this language', i.e. to define its structure and determine fundamental properties by means of the axiomatic method (*cf*., *ibid*.). But then: 'It may, however, be doubted whether the language of everyday life, after being 'rationalized' in this way would still preserve its naturalness' (*ibid*.).

g. Miller and Taliga offer (§7) a doubtful argument against my claim (2008, 373) that Tarski left us in the dark as to how his approach explains the way how meanings of all words of which a sentence is composed participate in the sentence's being true. Tarski really did not make such contribution (*cf*., e.g., 4.f above). They argue against me using a Tarskian definition – not Tarski's one as I have discussed, thus they are misdirected. They deceptively speak about merely regimented Czech although Czech must be (due to Tarski) heavily rebuilt into an axiomatic system. This enables model-theoretic semantics, which amounts to the extensional conception of meaning which is usually considered as quite insufficient for mod-

[8] I have mentioned in (2008, note 7) that my approach to truth is usable for both natural and formal languages, continuing in my criticism (*ibid*., 372 – 373) of Tarski who dismissed the idea to provide a definition of truth for natural-colloquial languages.

elling of natural languages because these are already interpreted (*cf*. 2008, note 6). An assigning of 'correct extensions' (§7), i.e. reference, to 'snow' and 'white' presupposes meanings of these words in Czech – something unexplained by Tarski as well as by Miller and Taliga.

h. They claim that I complained (on p. 365, 2008) about their 'effort to disperse the smokescreen of transparent intensional logic' (§8). My replay: Tichý's logic has exact distinctions inevitable for formally correct and materially adequate explications (*cf*. Tichý 1988); these are provably no 'smokescreen'. In the disputed place I complained mainly about their misidentification of 'languages with conceptual systems, thus words with concepts (moreover, concepts were partially identified with meanings' (2008, 365). To confuse such elementary things (as they do) is nothing to be proud of.

i. Finally, they recommend readers (§0) their previous criticisms of my defence of Tichý's approach (2007). They forgot to mention, however, that a plentitude of their spurious arguments against (2007) was disclosed and refuted in (2008).

Department of Philosophy
Faculty of Arts
Masaryk University
Arna Nováka 1
602 00 Brno, the Czech Republic
raclavsk@phil.muni.cz

REFERENCES

MILLER, D. – TALIGA, M. (2008): Through a Glass Darkly: A Final Rejoinder to Raclavský. *Organon F* 15, No. 4, 473 – 476.

ODDIE, G. (1986): *Likeness to Truth*. Dordrecht: Riedel.

RACLAVSKÝ, J. (2007): Conceptual Dependence of Verisimilitude (Against Miller's Translation Invariance Demand). *Organon F* 14, No. 3, 334 – 353.

RACLAVSKÝ, J. (2008): Conceptual Dependence of Verisimilitude Vindicated. A Farewell to Miller's Argument. *Organon F* 15, No. 3, 369 – 382.

TARSKI, A. (1956; 1930 in Polish, 1936 in German): The Concept of Truth in Formalized Languages. In: WOODGER, J. H. (ed.): *Logic, Semantics and Metamathematics*. Oxford: Clarendon Press, 152 – 278.

TICHÝ, P. (1978): Verisimilitude Revisited. *Synthese* 38, No. 2, 175 – 196.

TICHÝ, P. (1988): *The Foundations of Frege´s Logic*. Berlin, New York: Walter de Gruyter.