Of Pictures and Trivialities

Tue Trinh (Berlin, Germany)

Abstract

Wittgenstein's picture theory of language (PTL) unites grammar and logic as two sides of the same coin. A consequence of this theory, which Wittgenstein refuses to accept, is that trivialities are ill-formed. This turns out to be precisely what is claimed by Logicality, a recently developed thesis about natural language which has been corroborated by a large amount of empirical arguments. Logicality also provides an explanation for Wittgenstein's dissonant attitude towards trivialities. The discussion on PTL and Logicality brings out reasons to take a closer look at the historical relationship between analytic philosophy and generative linguistics.

Wittgenstein (1921), i.e. the Tractatus, proposes that sentences are pictorial: "Der Satz ist ein Bild der Wirklichkeit" (4.01). They represent states of affairs in the same way as, say, the score of Schubert's Unvollendete represents the sound of this symphony: "Die Grammophonplatte, der musikalische Gedanke, die Notenschrift, die Schallwellen, stehen alle in jener abbildenden internen Beziehung zu einander, die zwischen Sprache und Welt besteht" (4.014). Thus, the structure of a sentence is isomorphic to the structure of the state of affairs it describes: "Der Konfiguration der einfachen Zeichen im Satzzeichen entspricht die Konfiguration der Gegenstände in der Sachlage" (3.21). Just as we can compare the musical score and the musical sound to see if they match, we can compare a sentence and reality to see if the sentence is true: "Die Wirklichkeit wird mit dem Satz verglichen" (4.05). Grammar, then, specifies what states of affairs can exist, as it specifies what sentences are well-formed, i.e. can be true: "Die Grenzen meiner Sprache bedeuten die Grenzen meiner Welt" (5.6). Logic would then "für sich selber sorgen", since inferences would be constrained by reality in the same way depiction is. Just as we cannot fail to see in a picture what must be the case if it is true: "Wir können uns, in gewissem Sinne, nicht in der Logik irren" (5.473). This is known as the "picture theory of language", henceforth PTL (Daitz 1953, Keyt 1964, Hintikka 1994).

One would think that a consequence of PTL is that trivialities, i.e. sentences which are tautological or contradictory, should not be part of the symbolism. In other words, tautology and contradiction should be excluded from the set of structures which can be generated by the combinatorial rules of the representational system. They should be "ill-formed", so the speak. This is

intuitive: just as we cannot use musical notation to produce a score which matches every or no possible piece of music, we cannot use linguistic signs to construct a model of every or no possible state of affairs. At various places in the Tractatus, Wittgenstein seems to show awareness of this result: "Tautologie und Kontradiktion sind nicht Bilder der Wirklichkeit" (4.462). Since sentences, by hypothesis, are pictures of reality, it follows that "Sätze, die für jede Sachlage wahr sind, können überhaupt keine Zeichenverbindungen sein" (4.466). This means tautologies are ill-formed, and the same, of course, should hold for contradictions, which are the negation of tautologies: "Tautologie und Kontradiktion sind die Grenzfälle der Zeichenverbindung, nämlich ihre Auflösung" (4.466). However, Wittgenstein stops short of identifying triviality with ill-formedness. He calls combinations of signs, such as "Socrates is identical", which violate logical syntax "unsinnig" (nonsensical), and says, explicitly, that "Tautologie und Kontradiktion sind [...] nicht unsinnig", insisting that "sie gehören zum Symbolismus" (4.4611). Nevertheless, he ends up using an word which is very close, morphologically and semantically, to "unsinnig" to describe trivialities. The word is "sinnlos" (senseless): "Tautologie und Kontradiktion sind sinnlos" (4.461). Thus, nonsensical sentences and senseless sentences are both uninterpretable, but only the former violate the rules of logical syntax, i.e. are ungrammatical.

Wittgenstein's position, in my view, is inconsistent. The theory of language he proposes entails that trivialities are not sentences, as they are not pictures. However, Wittgenstein maintains that trivialities are sentences. Why does Wittgenstein commit to the last proposition?

I submit that Wittgenstein has committed an error in distinguishing between senseless and nonsensical sentences in the Tractatus. I would make the case that PTL is consistent only if this distinction is eliminated, i.e. only if senseless sentences are also nonsensical. My hypothesis is that the reason Wittgenstein does not consider trivialities ill-formed is phenomenological: he succumbs to the natural intuition that sentences can be trivial and well-formed at the same time. Thus, it would seem obvious to Wittgenstein, for example, that "it's raining and not raining", a sentence perceived as well-formed, has the analysis [rain & not-rain], which is a contradiction. This intuition, I propose, is an illusion, caused by the failure to recognize the proper "transformative analysis" of the sentence (Beaney 2002, 2003, 2016). Thus, I would say that

Tue Trinh, "Of Pictures and Trivialities". In *100 Years of Tractatus Logico-Philosophicus — 70 Years after Wittgenstein's Death. A Critical Assessment.* Beiträge der Österreichischen Ludwig Wittgenstein Gesellschaft / Contributions of the Austrian Ludwig Wittgenstein Society. Band / Vol. XXIX. Hrsg. von / ed. by Alois Pichler, Esther Heinrich-Ramharter, Friedrich Stadler, in cooperation with Joseph Wang-Kathrein. Kirchberg/W.: ALWS 2023.

573

Wittgenstein falls prey to precisely the kind of problems he sets out to solve. What would have helped him out of the fly bottle in this case, I believe, is a theory of natural language which (i) identifies triviality with ill-formedness and (ii) shows what the proper transformative analysis of sentences such as "it's raining and not raining" is under which it is not trivial.

There is, as it turns out, such a theory. It has recently been developed in linguistic research and goes by the name of "Logicality". Logicality states that universal grammar has access to a natural deductive system which filters out and marks as ill-formed sentences expressing trivialities (von Fintel 1993, Krifka 1995, Fox 2000, Gajewski 2003, Fox and Hackl 2006, Chierchia 2013, Del Pinal 2019, Pistoia-Reda and Sauerland 2021, Del Pinal 2022). To illustrate, consider the contrast between the sentence "every student but John came", which is clearly perceived as well-formed, and the sentence "a student but John came", which is clearly not. This contrast, as pointed out by Peters & Westerståhl (2023), was observed as early as in the 14th century by William Ockham: "An exceptive proposition is never properly formed unless its non-exceptive counterpart is a universal proposition. Hence, "a man except Socrates is running" is not properly formed" (from Summa Logicae Part II:18, translated by Alfred J. Freddoso and Henry Schuurman). An influential account of the contrast is von Fintel (1993). The central idea in this account is that the word "but" has a semantics which results in the first sentence entailing 'every student who is not John came and it is not the case that every student came' and second sentence entailing 'a student who is not John came and it is not the case that a student came'. As the second entailment is contradictory, the second sentence, i.e "a student but John came", is ill-formed. (For examples of ill-formedness caused by sentences being tautologous see Barwise and Cooper 1981, Bylinina and Nouwen 2018, Haida and Trinh 2020, among others.)

Logicality, of course, has to explain why "it's raining and not raining" feels perfectly well-formed. One variant of Logicality (Del Pinal 2019, Pistoia-Reda and Sauerland 2021, Del Pinal 2022) proposes that natural language grammar contains a covert, context-sensitive "rescaling" operator which attaches to "non-logical" expressions and shifts their meaning. The logical form of "it's raining and not raining" is then not [rain & not-rain] but [R(c)(rain) & not-R(c')(rain)], which is not a contradiction, because the meaning of R(c)(rain) might be

different from that of R(c')(rain). In other words, the sentence can have the non-contradictory reading of 'it's raining in some sense and not raining in another sense'. Speakers, however, may not be consciously aware of this process. The interaction of the natural deductive system and universal grammar takes place at a subconscious level. It results in judgements of acceptability which speakers can intuit but not explicate. Note, importantly, that rescaling will not rescue "a student but John came", as no semantic modulation of the non-logical terms – i.e. "student", "John", "came" – could rescue the sentence from being a contradiction.

An issue arises which the proponents of Logicality must address and which is also raised by Wittgenstein in the Tractatus. This is the issue of how to distinguish between logical and non-logical constants? For Wittgenstein, the logical constants are those expressions that will disappear in the proper semantic analysis: what they express, namely entailment relations, would emerge from the pictorial nature of the symbols in the ideal notation. Until we succeed in constructing such a notation, however, we have to deal with logical constants in our non-ideal language. Wittgenstein says of such expressions that they do not represent: "Mein Grundgedanke ist, dass die 'logischen Konstanten' nicht vertreten" (4.0312). This description more or less captures our intution about such words as "every", "a", and "but". The rescaling story works under the assumption that these words are logical constants. It is true, in some sense, that they do not "represent" anything. However, this description turns out to be too vague. It is not clear what would prevent me from saying, for example, that "every" refers to the relation 'is a subset of', which is the set of pairs <X,Y> such that X is a subset of Y. We need a more rigorous definition of logical constants.

It turns out, however, that such a definition is quite difficult to formulate. Gajewski (2003) suggests to define logical constants in terms of "permutation invariance". Logical constants, then, would be those expressions whose denotation remains constant across permutations of individuals in the domain. Gajewski's proposal is widely known and cited. However, it clearly cannot be the whole story, as it classifies predicates like "exists" or "is self-idential", which supposedly denote the universe of discourse U, as logical. Obviously, U remains the same under all permutations of the individuals in it. It can be observed, however, that these expressions do not incur ill-

Tue Trinh, "Of Pictures and Trivialities". In *100 Years of Tractatus Logico-Philosophicus — 70 Years after Wittgenstein's Death. A Critical Assessment.* Beiträge der Österreichischen Ludwig Wittgenstein Gesellschaft / Contributions of the Austrian Ludwig Wittgenstein Society. Band / Vol. XXIX. Hrsg. von / ed. by Alois Pichler, Esther Heinrich-Ramharter, Friedrich Stadler, in cooperation with Joseph Wang-Kathrein. Kirchberg/W.: ALWS 2023.

575

formedness as we would expect: neither "every man exists" nor "every student is self-idential" is ill-formed, despite the fact that no matter how we modulate the meaning of "man" and "student", the sets they denote will be a subset of U. There would then be no reading of these sentences in which they are not trivial. This means that "exists" and "self-identical" are in fact not logical constants, as far as the language system is concerned. To the best of my knowledge, an adequate intensional definition of logical constants is still missing. At this stage, a wealth of data find illuminating explanations in terms of Logicality. These explanations appeal to an intuitive notion of "logical constants", but the distinction they draw between logical and non-logical terms is, in the end, stipulative. It is, of course, also possible that the distinction will turn out to be essentially stipulative, i.e. that analyticity is conventional by nature.

We can thus summarize Logicality as follows: (i) trivialities are ill-formed; (ii) seemingly trivial sentences that are perceived as well-formed are in fact not trivial.

Recall Wittgenstein's inconsistency: he takes trivialities to be well-formed even though the theory of language which he proposes, PTL, predicts them to be ill-formed. This inconsistency, I hypothesize, is due to his inadequate analysis of a class of natural language expressions: he analyzes a sentence such as "it's raining and not raining", which is perceived to be perfectly well-formed, as a contradiction. Logicality provides a way to overcome this inadequacy: it makes it possible to analyze this sentence as contingent.

I will now briefly comment on some points of contact between analytic philosophy and theoretical linguistics which have been brought into relief by our discussion.

Analytic philosophy began with the insight that the "logical form" of a sentence, i.e. one which captures its semantic properties, might be quite different from its "surface form", i.e. one which captures its syntactic, morphological and phonological properties. The most well-known example is perhaps Russell's (1905) analyis of definite descriptions, according to which the sentence "the present King of France" has the logical form which is true if and only if there is there is exactly one king of France who is bald. This constitutes

a "revolution" in the way we think about natural language sentences: semantic analysis must be carried out on a structure different from one which inputs pronunciation or writing. Beaney (2016: 235) puts it succinctly: "[T]here is no decomposition without interpretation". The term "interpretation" here is to be understood as 'translation' or 'transformation'. Thus, semantic analysis consists of (i) the step of "transformative analysis" which translate the surface form of the sentence into its logical form, and (ii) the step of "decompositional analysis" which dissects the logical form and computes its consequences (Beaney 2000, 2002, 2003, 2016, 2017).

This means, effectively, that a sentence is associated with at least one structure which inputs pronunciation and one other structure which inputs interpretation. Transformative analysis is the step that relates the two. As it happens, the idea that a sentence is associated with more than one structure is foundational to modern linguistics. It brought about the "generative revolution" in the 1950's (Chomsky 1988). In the current "minimalist" version of generative grammar which has established itself more or less as cannonical (Chomsky 1991, 1995, Radford 2004), a sentence is associated with two structures: a "phonological form" (PF) and a "logical form" (LF). PF inputs pronunciation while LF inputs interpretation. PF and LF are related by "transformational rules" which build complex structures from lexical items step by step. The LF of a sentence, just like the logical form which results from transformative analysis, can differ drastically from how we hear the sentence or see it written on paper. We can thus witness an interesting parallel between the "analytic revolution" in philosophy and the "generative revolution" in linguistics. A notable fact is that the former came much earlier. Its beginning can be dated to Frege's 1879 debut, Begriffsschrift, wherein he proposes quantificational predicate logic (Beaney 2016: 228). The beginning of generative grammar, in contrast, came with Chomsky's 1955 magnum opus, The Logical Structure of Linguistic Theory, wherein he proposes transformations. And it would take the linguists about 20 years more to come up with the idea of LF as a structure which disambiguates scopal relations between quantificational elements in the sentence (May 1977, Chomsky 1981, Huang 1982, May 1985). What is the reason for this delay?

The answer, I believe, lies in the difference between early analytic philosophers and generative grammarians with respect to their view on the

Tue Trinh, "Of Pictures and Trivialities". In *100 Years of Tractatus Logico-Philosophicus — 70 Years after Wittgenstein's Death. A Critical Assessment.* Beiträge der Österreichischen Ludwig Wittgenstein Gesellschaft / Contributions of the Austrian Ludwig Wittgenstein Society. Band / Vol. XXIX. Hrsg. von / ed. by Alois Pichler, Esther Heinrich-Ramharter, Friedrich Stadler, in cooperation with Joseph Wang-Kathrein. Kirchberg/W.: ALWS 2023.

577

surface form of natural language sentences. For the former, this form is haphazard. Serious investigation can only begin after transformative analysis, which is carried out by the philosopher contemplating on what the sentence means. However, the step of transformative analysis is itself shrouded in mystery: there is no theory of it. Coming up with the logical form of a sentence is, therefore, similar to scientific discovery in its spontaneous and revelatory nature. In contrast, generative grammarians take the relation between PF and LF to be systematic: both are derived by transformational rules, which are codified in a unified theory. It is understandable that it takes more time to figure out how something works than to realize that it works.

References

Barwise, Jon, and Robin Coope (1981) "Generalized quantifiers and natural language", *Linguistics and Philosophy* 4, 159–219.

Beaney, Michael (2000) "Conceptions of analysis in early analytic philosophy", *Acta Analytica* 15, 97-115.

Beaney, Michael (2002) "Decompositions and transformations: Conceptions of analysis in the early analytic and phenomenological traditions", *Southern Journal of Philosophy* 40, 53-99.

Beaney, Michael (2003) "Russell and Frege", in: Nicholas Griffin (ed.) *The Cambridge Companion to Bertrand Russell*, Cambridge: Cambridge University Press, 128-170.

Beaney, Michael (2016) "The Analytic Revolution", *Royal Institute of Philosophy Supplements* 78, 227-249.

Beaney, Michael (2017) *Analytic Philosophy: A Very Short Introduction*, Oxford: Oxford University Press.

Bylinina, Lisa, and Rick Nouwen (2018) "On zero and semantic plurality", *Glossa: a journal of general linguistics* 3, 1-23.

Chierchia, Gennaro (2013) *Logic in Grammar*, Oxford: Oxford University Press.

Chomsky, Noam (1955) *The Logical Structure of Linguistic Theory*, Manuscript, Harvard University and MIT.

Chomsky, Noam (1981) *Lectures on Government and Binding*, Dordrecht: Foris.

Chomsky, Noam (1988) *The Generative Enterprise: A Discussion with Riny Huybregts and Henk van Riemsdijk*, Dordrecht: Foris.

Chomsky, Noam (1991) "Some notes on economy of derivation and representation", in: Robert Freidin (ed.) *Principles and Parameters in Comparative Grammar*, Cambridge: MIT Press, 417-454.

Chomsky, Noam (1995) *The Minimalist Program.* Cambridge: MIT Press.

Daitz, Edna (1953) "The picture theory of meaning", *Mind* 62, 184-201.

Del Pinal, Guillermo (2019) "The logicality of language: A new take on triviality, 'ungrammaticality', and logical form", *Noûs* 53, 785-818.

Del Pinal, Guillermo (2022) "Logicality of Language: Contexualism versus Semantic Minimalism", *Mind* 131, 381-427.

von Fintel, Kai (1993) "Exceptive constructions", *Natural Language Semantics* 1, 123-148.

Fox, Danny (2000) *Economy and Semantic Interpretation*, Cambridge: MIT Press.

Fox, Danny, and Martin Hackl (2006) "The universal density of measurement", *Linguistics and Philosophy* 29, 537-586.

Frege, Gottlob (1879) *Begriffsschrift: Eine der arithmetischen nachgebildete Formelsprache des reinen Denkens.* Halle: Neubert.

Gajewski, Jon (2003) "L-analyticity in natural language", Unpublished manuscript.

Haida, Andreas, and Tue Trinh (2020) "Zero and triviality", *Glossa: A journal of general linguistics* 5, 1-14.

Hintikka, Jaakko (1994) "An Anatomy of Wittgenstein's Picture Theory", in: Carol C. Gould and Robert S. Cohen (eds.) *Artifacts, Representations and Social Practice: Essays for Marx Wartofsky* , Dordrecht: Kluwer Academic Publishers, 223-256.

Huang, C.-T. James (1982) *Logical Relations in Chinese and the Theory of Grammar*, Doctoral Dissertation, MIT.

Keyt, David (1964) "Wittgenstein's picture theory of language", *The Philosophical Review* 73, 493-511.

Krifka, Manfred (1995) "The semantics and pragmatics of polarity items", *Linguistic Analysis* 25, 209-257.

May, Robert (1977) *The Grammar of Quantification*, Doctoral Dissertation, MIT.

May, Robert (1985) *Logical Form: Its Structure and Derivation*, Cambridge: MIT Press.

Peters, Stanley, and Dag Westerståhl (2023) "The semantics of exceptives", *Linguistics and Philosophy* 46, 197-235.

Tue Trinh, "Of Pictures and Trivialities". In *100 Years of Tractatus Logico-Philosophicus — 70 Years after Wittgenstein's Death. A Critical Assessment.* Beiträge der Österreichischen Ludwig Wittgenstein Gesellschaft / Contributions of the Austrian Ludwig Wittgenstein Society. Band / Vol. XXIX. Hrsg. von / ed. by Alois Pichler, Esther Heinrich-Ramharter, Friedrich Stadler, in cooperation with Joseph Wang-Kathrein. Kirchberg/W.: ALWS 2023. 579

Pistoia-Reda, Salvatore, and Uli Sauerland (2021) "Analyticity and modulation - Broadening the rescale perspective on language logicality", *International Review of Pragmatics* 13, 1-13.

Radford, Andrew (2004) *Minimalist Syntax - Exploring the Structure of English*. Cambridge: Cambridge University Press.

Russell, Bertrand (1905) "On Denoting", *Mind* 14, 479-493.

Wittgenstein, Ludwig (1921) "Logisch-philosophische Abhandlung", *Annalen der Naturphilosophie* 14, 185-262.

Acknowledgement