LOGIC OF NATURAL LANGUAGE pdf

1: The Difference Between Natural Languages and Formal Languages | The

*The Logic of Natural Language (Clarendon Library of Logic and Philosophy) [Frederic Tamler Sommers] on www.enganchecubano.com *FREE* shipping on qualifying offers.*

Here are the key points I want to emphasize: Formal languages are very different from natural languages Natural languages exist in the real world, in flesh-and-blood communities of language users. The grammar of a natural language like English is incredibly complex. We discover the grammar of natural language through empirical investigation. PL is a formal language, an artificial language. The grammar of an artificial language like PL is incredibly simple. The properties of formal languages are mathematically stipulated. Formal languages exist as mathematical abstractions. Metaphysically, they have more in common with computer code than real-world spoken language. We use formal languages as simplified models of natural language English has conjunctions, disjunctions and conditionals. This is why we invent formal languages like PL â€" to help us answer these kinds of questions. Any given formal language is designed to represent or model the logical behavior of a select few natural language words. When we use it we abstract away from all other features of natural language sentences. The whole apparatus of PL exists in order to model the logical properties of a small handful of natural language words. Symbols help us to distinguish the model from what is being modeled. We stipulate, for example, that the semantics of PL is truth-functional, and we give precise rules for determining when any compound sentence within the language is true or false, for all possible truth values of the component sentences. The logical connectives are formal abstractions defined by mathematical rules. The English language connectives are part of the real world of semantically complex linguistic practices, deployed by real-world language users trying to communicate with one another. PL is as different from natural language as a system of differential equations is from the real-world system that the equations are designed to model. However, just as abstract mathematical representations can be used to model, to represent aspects of the behavior of real-world physical systems, so can abstract formal languages be used to model or represent aspects of the behavior of real-world languages and language users. Hence we can ask: When the behavior of a physical system is accurately described by the behavior of a mathematical model, this tells us something about the physical system. Similarly, when the behavior of natural language is accurately described by the behavior of a formal language, this tells us something about natural language. Think of natural human language by analogy with a functioning human brain. We can construct models of neural function, models of information processing within brain regions, models of higher level computational functioning, models of how symbolic representations might be instantiated and manipulated in the brain, and so on. It gives us insight into aspects of brain function, but the complexity of brain function far outstrips these models. Language is like this. Linguists study different aspects of natural language from many different theoretical perspectives, but our understanding is still very partial, very incomplete. Formal languages help us to understand certain aspects of natural language, but we should not be surprised to learn that natural language transcends the simple rules described by our formal, artificial toy languages.

2: MATHS: Semantics of English

Fred Sommers on the Logic of Natural Language INTRODUCTION "The essay before you is the fruit of some fifteen years of investigation into the logical syntax of natural language.

In the summer of I read a paper to the Congress on Logic and Scientific Method at Bedford College, London, that presented an algorithm for the algebraic treatment of syllogistic arguments in which categorical propositions were transcribed as fractions and reciprocals. The first article on the more general calculus was published in Mind, January , as The Calculus of Terms. Unfortunately its message had little effect although I followed it by a series of articles that exploited the new notation and exposed some important consequences for the philosophy of language. It became clear that the current Fregean logic had fully replaced the more traditional logic of terms and that articles could not do justice to the neo-classical alternative that I was advocating. I had for some years been planning to write a book on the logic of categories but the lack of response to my more recent interests, the logic of terms and its relation to natural syntax, strongly suggested that I must first do book-length justice to these latter topics. I began writing this essay in and, after several long interruptions and two revisions, completed it in the summer of I still hope to write the book on category theory. More generally the theory of logical form that has its source in the formation rules for standard languages poses severe problems for the linguist. Apparently I was not alone in representing categorical propositions as fractions. Charles Merchant, a mathematician at the University of Arizona, subsequently wrote me of his independent work on this algorithm. The arguments for abandoning the old logic were not conclusive. Once entrenched, the new logic felt no need for supporting arguments. Today logic students are given at best some bad old arguments against the old logic, and then are simply presented with the new logic to be learned. He has challenged the deeply entrenched presumption that no syllogistic logic can measure up to the great power and beauty of the predicate calculus. What is more, not only has Sommers shown the emperor to have no clothes, he has produced a fine new suit. He has returned to the venerable but forgotten logic of Aristotle, Ockham, and Leibniz, and has shown that it does have hidden assets which make it more than adequate as an alternative to the orthodox system. So I think this rebellion is well worth joining. Sommers speaks of "the perverse pleasure of advocacy-in this day and age-of Aristotle over Frege. Some may explicitly reject parts of it. But all recognize its importance. He moved to Brandeis University in as associate professor of philosophy, was promoted to full professor in , and held the Harry Austryn Wolfson Chair of Philosophy from until his retirement in Sommers was a staunch proponent of a traditionalist view of logic, albeit in a "modern" guise. He has consistently expressed the view that progress in logic should have stopped, if not with Leibniz, than at least before Frege, devising a variant of syllogistic very close to that undertaken by Leibniz. In Logic of Natural Language Sommers developed the system in more detail together with a consideration of its purported philosophical implications. He argued that his calculus of terms is significantly different from the predicate logic; but Gregory MCCulloch [] argued that there really is no such difference. His book The Logic of Natural Language provides a detailed, systematic and unified elaboration of the Ordinary Language Tree and the Calculus of Terms and explores the philosophical import of this logical system. His Invitation to Formal Reasoning: The Logic of Terms provides a textbook elaboration of the logic of terms. The idea of a logical syntax of natural language stands opposed to what the Fregean believes about logical form. Frege himself held that an adequate account of inferences expressed in natural language requires translation into a new idiom, the idiom of a language expressly constructed for use by logicians. This new logical language is no mere convenience: Frege believed that the syntax of natural language was logically useless, misleading, and incoherent. Being convinced of this, Frege did not criticize the grammarian for misconstruing natural language. If so the inadequacy is not in the grammarian but in his subject-matter. NTL [Numerical Term Logic] works within the assumption that all logical statements are affirmations as to the quantity of members of a set or subset.

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3: Natural language - Wikipedia

natural language, one way to define the logic of a natural language is as the norms or rules of necessary relationships that result from the meanings of the words and expressions of a natural language.

Wrapping Up Natural Language Has a Logical Structure Natural language is a complex phenomenon that can be studied from many different disciplinary perspectives: But what is truly distinctive and valuable about human natural language is its semantic or representational capacities â€” the features of language responsible for how words carry meaning, and how words can be combined into sentences to make an indefinite number of distinct, meaningful assertions about the world. Linguists commonly distinguish three different perspectives from which one can study the representational capacity of language: Syntax involves the rules for combining words and parts of speech into meaningful sentences. The syntax of a language specifies the rules that explain why the former is a well-formed sentence but the latter is not. Different languages will have different rules, but many languages will share rules, and some rules may be shared by all languages. Semantics, in this sense, is about how expressions in a language can refer to, or be about, objects or states of affairs in the world. Pragmatics involves the social and contextual dimensions of human communication that determine how utterances are interpreted and acquire meaning in real-world situations. Understanding the pragmatic dimensions of communication is an important part of being a competent user of a natural language. All three dimensions of language are involved in determining the meaning of natural language utterances. So far so good. But where does logic enter the picture? Well, here are two claims that have been made about natural language: The semantics of natural language is generative. Competent users of a natural language are able to understand the meaning of an indefinite number of different sentences, and can generate an indefinite number of different sentences, even though the vocabulary of a language is finite. By applying a finite number of syntactical rules to a finite vocabulary, we are able to generate and understand a virtual infinity of meaningful sentences. A note about this terminology. The semantics of natural language is compositional. In natural language, meaningful expressions are built up from other meaningful expressions. Now, this looks suspiciously like a translation exercise in propositional logic that you would learn how to do in a symbolic logic class. Propositional logic was designed to model this kind of compositional semantics. This suggests one obvious relationship between logic and language. Logical systems can represent or model important structural features of natural language, such as the generativity and compositionality of language. Of course we can always ask whether natural language really is generative and compositional in the ways suggested here. Many have thought so, but this is an empirical question that can only be settled by empirical investigation. Natural language may not turn out to be strictly compositional, but there are compelling arguments that natural language is by-and-large compositional. On the other hand, many artificial languages, like those studied in an introductory symbolic logic class, are designed to meet the requirement of compositionality. Thus, one way that logic is relevant to linguistics is that by creating and studying the properties of artificial languages, and comparing those with the properties of natural language that we discover through empirical investigation, we can gain some insight into the logical properties of natural language.

4: Classical Logic (Stanford Encyclopedia of Philosophy)

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Modal logic In languages, modality deals with the phenomenon that sub-parts of a sentence may have their semantics modified by special verbs or modal particles. For example, "We go to the games" can be modified to give "We should go to the games", and "We can go to the games" and perhaps "We will go to the games". More abstractly, we might say that modality affects the circumstances in which we take an assertion to be satisfied. Confusing modality is known as the modal fallacy. His work unleashed a torrent of new work on the topic, expanding the kinds of modality treated to include deontic logic and epistemic logic. The seminal work of Arthur Prior applied the same formal language to treat temporal logic and paved the way for the marriage of the two subjects. Saul Kripke discovered contemporaneously with rivals his theory of frame semantics , which revolutionized the formal technology available to modal logicians and gave a new graph-theoretic way of looking at modality that has driven many applications in computational linguistics and computer science , such as dynamic logic. Informal reasoning and dialectic[edit] Main articles: Informal logic and Logic and dialectic The motivation for the study of logic in ancient times was clear: This ancient motivation is still alive, although it no longer takes centre stage in the picture of logic; typically dialectical logic forms the heart of a course in critical thinking , a compulsory course at many universities. Dialectic has been linked to logic since ancient times, but it has not been until recent decades that European and American logicians have attempted to provide mathematical foundations for logic and dialectic by formalising dialectical logic. Dialectical logic is also the name given to the special treatment of dialectic in Hegelian and Marxist thought. There have been pre-formal treatises on argument and dialectic, from authors such as Stephen Toulmin The Uses of Argument , Nicholas Rescher Dialectics , [32] [33] [34] and van Eemeren and Grootendorst Pragma-dialectics. Theories of defeasible reasoning can provide a foundation for the formalisation of dialectical logic and dialectic itself can be formalised as moves in a game, where an advocate for the truth of a proposition and an opponent argue. Such games can provide a formal game semantics for many logics. Argumentation theory is the study and research of informal logic, fallacies, and critical questions as they relate to every day and practical situations. Specific types of dialogue can be analyzed and questioned to reveal premises, conclusions, and fallacies. Argumentation theory is now applied in artificial intelligence and law. Mathematical logic Mathematical logic comprises two distinct areas of research: Mathematical theories were supposed to be logical tautologies , and the programme was to show this by means of a reduction of mathematics to logic. If proof theory and model theory have been the foundation of mathematical logic, they have been but two of the four pillars of the subject. Recursion theory captures the idea of computation in logical and arithmetic terms; its most classical achievements are the undecidability of the Entscheidungsproblem by Alan Turing , and his presentation of the Churchâ€”Turing thesis. Most philosophers assume that the bulk of everyday reasoning can be captured in logic if a method or methods to translate ordinary language into that logic can be found. Philosophical logic is essentially a continuation of the traditional discipline called "logic" before the invention of mathematical logic. Philosophical logic has a much greater concern with the connection between natural language and logic. As a result, philosophical logicians have contributed a great deal to the development of non-standard logics e. Logic and the philosophy of language are closely related. Philosophy of language has to do with the study of how our language engages and interacts with our thinking. Logic has an immediate impact on other areas of study. Studying logic and the relationship between logic and ordinary speech can help a person better structure his own arguments and critique the arguments of others. Many popular arguments are filled with errors because so many people are untrained in logic and unaware of how to formulate an argument correctly. Computational logic and Logic in computer science A simple toggling circuit is expressed using a logic gate and a synchronous register. Logic cut to the heart of computer science as it emerged as a discipline: The notion of the general purpose computer that came from this work was of fundamental importance to the designers of the computer machinery in the s. In the s and s, researchers predicted that when human knowledge could be expressed using logic with mathematical notation , it would be possible to create a machine that reasons, or artificial intelligence. This was more difficult than expected because of the complexity of human reasoning. In logic programming , a program consists of a set of axioms and rules. Logic programming systems such as Prolog compute the consequences of the axioms and rules in order to answer a query. Today, logic is extensively applied in the fields of artificial intelligence and computer science , and these fields provide a rich source of problems in formal and informal logic. Argumentation theory is one good example of how logic is being applied to artificial intelligence. Boolean logic as fundamental to computer hardware:

5: Natural Language Has a Logical Structure | The Critical Thinker

Defining natural language. Though the exact definition varies between scholars, natural language can broadly be defined in contrast to artificial or constructed languages (such as computer programming languages and international auxiliary languages) and to other communication systems in nature.

Introduction Today, logic is a branch of mathematics and a branch of philosophy. In most large universities, both departments offer courses in logic, and there is usually a lot of overlap between them. Formal languages, deductive systems, and model-theoretic semantics are mathematical objects and, as such, the logician is interested in their mathematical properties and relations. Soundness, completeness, and most of the other results reported below are typical examples. Philosophically, logic is at least closely related to the study of correct reasoning. Reasoning is an epistemic, mental activity. So logic is at least closely allied with epistemology. Logic is also a central branch of computer science, due, in part, to interesting computational relations in logical systems, and, in part, to the close connection between formal deductive argumentation and reasoning see the entries on recursive functions , computability and complexity , and philosophy of computer science. This raises questions concerning the philosophical relevance of the various mathematical aspects of logic. How do deducibility and validity, as properties of formal languages--sets of strings on a fixed alphabet--relate to correct reasoning? What do the mathematical results reported below have to do with the original philosophical issues concerning valid reasoning? This is an instance of the philosophical problem of explaining how mathematics applies to non-mathematical reality. Typically, ordinary deductive reasoning takes place in a natural language, or perhaps a natural language augmented with some mathematical symbols. So our question begins with the relationship between a natural language and a formal language. Without attempting to be comprehensive, it may help to sketch several options on this matter. One view is that the formal languages accurately exhibit actual features of certain fragments of a natural language. Some philosophers claim that declarative sentences of natural language have underlying logical forms and that these forms are displayed by formulas of a formal language. Other writers hold that successful declarative sentences express propositions; and formulas of formal languages somehow display the forms of these propositions. On views like this, the components of a logic provide the underlying deep structure of correct reasoning. A chunk of reasoning in natural language is correct if the forms underlying the sentences constitute a valid or deducible argument. See for example, Montague [], Davidson [], Lycan [] and the entry on logical form. Another view, held at least in part by Gottlob Frege and Wilhelm Leibniz, is that because natural languages are fraught with vagueness and ambiguity, they should be replaced by formal languages. A similar view, held by W. One desideratum of the enterprise is that the logical structures in the regimented language should be transparent. A regimented language is similar to a formal language regarding, for example, the explicitly presented rigor of its syntax and its truth conditions. On a view like this, deducibility and validity represent idealizations of correct reasoning in natural language. A chunk of reasoning is correct to the extent that it corresponds to, or can be regimented by, a valid or deducible argument in a formal language. When mathematicians and many philosophers engage in deductive reasoning, they occasionally invoke formulas in a formal language to help disambiguate, or otherwise clarify what they mean. In other words, sometimes formulas in a formal language are used in ordinary reasoning. This suggests that one might think of a formal language as an addendum to a natural language. Then our present question concerns the relationship between this addendum and the original language. What do deducibility and validity, as sharply defined on the addendum, tell us about correct deductive reasoning in general? Another view is that a formal language is a mathematical model of a natural language in roughly the same sense as, say, a collection of point masses is a model of a system of physical objects, and the Bohr construction is a model of an atom. In other words, a formal language displays certain features of natural languages, or idealizations thereof, while ignoring or simplifying other features. The purpose of mathematical models is to shed light on what they are models of, without claiming that the model is accurate in all respects or that the model should replace what it is a model of. On a view like this, deducibility and validity represent mathematical models of perhaps different aspects of correct reasoning in natural languages. Correct chunks of deductive reasoning correspond, more or less, to valid or deducible arguments; incorrect chunks of reasoning roughly correspond to invalid or non-deducible arguments. See, for example, Corcoran [], Shapiro [], and Cook []. There is no need to adjudicate this matter here. Perhaps the truth lies in a combination of the above options, or maybe some other option is the correct, or most illuminating one. We raise the matter only to lend some philosophical perspective to the formal treatment that follows. Language Here we develop the basics of a formal language, or to be precise, a class of formal languages. Again, a formal language is a recursively defined set of strings on a fixed alphabet. Some aspects of the formal languages correspond to, or have counterparts in, natural languages like English. We call these terms. We assume a stock of individual constants. These are lower-case letters, near the beginning of the Roman alphabet, with or without numerical subscripts: In the present system each constant is a single character, and so individual constants do not have an internal syntax. Thus we have an infinite alphabet. We also assume a stock of individual variables. These are lower-case letters, near the end of the alphabet, with or without numerical subscripts: We need to be able to denote specific, but unspecified or arbitrary objects, and sometimes we need to express generality. In our system, we use some constants in the role of unspecified reference and variables to express generality. Both uses are recapitulated in the formal treatment below. Constants and variables are the only terms in our formal language, so all of our terms are simple, corresponding to proper names and some uses of pronouns. We call a term closed if it contains no variables. Some authors also introduce function letters, which allow complex terms corresponding to: Logic books aimed at mathematicians are likely to contain function letters, probably due to the centrality of functions in mathematical discourse. Books aimed at a more general audience or at philosophy students , may leave out function letters, since it simplifies the syntax and theory. We follow the latter route here. This is an instance of a general tradeoff between presenting a system with greater expressive resources, at the cost of making its formal treatment more complex. These are upper-case letters at the beginning or middle of the alphabet. A superscript indicates the number of places, and there may or may not be a subscript. We often omit the superscript, when no confusion will result. They correspond to free-standing sentences whose internal structure does not matter. The non-logical terminology of the language consists of its individual constants and predicate letters. In taking identity to be logical, we provide explicit treatment for it in the deductive system and in the model-theoretic semantics. Most authors do the same, but there is some controversy over the issue Quine [, Chapter 5]. Examples of atomic formulas include: If an atomic formula has no variables, then it is called an atomic sentence. If it does have variables, it is called open. In the above list of examples, the first and second are open; the rest are sentences. That is, all formulas are constructed in accordance with rules 1 â€” 7. Clause 8 allows us to do inductions on the complexity of formulas. If a certain property holds of the atomic formulas and is closed under the operations presented in clauses 2 â€” 7 , then the property holds of all formulas. Here is a simple example: Moreover, each left parenthesis corresponds to a unique right parenthesis, which occurs to the right of the left parenthesis. Similarly, each right parenthesis corresponds to a unique left parenthesis, which occurs to the left of the given right parenthesis. If a parenthesis occurs between a matched pair of parentheses, then its mate also occurs within that matched pair. In other words, parentheses that occur within a matched pair are themselves matched. By clause 8 , every formula is built up from the atomic formulas using clauses 2 â€” 7. The atomic formulas have no parentheses. Parentheses are introduced only in clauses 3 â€” 5 , and each time they are introduced as a matched set. So at any stage in the construction of a formula, the parentheses are paired off. We next define the notion of an occurrence of a variable being free or bound in a formula. We do not even think of those as occurrences of the variable. All variables that occur in an atomic formula are free. That is, the unary and binary connectives do not change the status of variables that occur in them. Although it does not create any ambiguities see below , we will avoid such formulas, as a matter of taste and clarity. These, too, will be avoided in what follows. Some treatments of logic rule out vacuous binding and double binding as a matter of syntax. That simplifies some of the treatments below, and complicates others. Free variables correspond to place-holders, while bound variables are used to express generality. If a formula has no free variables, then it is called a sentence. If a formula has free variables, it is called open. This helps draw the contrast between formal languages and natural languages like English. We assume at the outset that all of the categories are disjoint. For example, no connective is also a quantifier or a variable, and the non-logical terms are not also parentheses or connectives. Also, the items within each category are distinct.

6: Logic - Wikipedia

A natural language is a human language, such as English or Standard Mandarin, as opposed to a constructed language, an artificial language, a machine language, or the language of formal logic. Also called ordinary language.

Between Logic and Natural Language Published: July 16, Andrea Iacona, Logical Form: Between Logic and Natural Language, Springer, , pp. Reviewed by Gilad Nir, University of Leipzig The notion of logical form plays various roles in contemporary philosophy. It is appealed to when we evaluate the validity of arguments; it is said to underlie the structure of sentences; it forms part of theories of meaning; and it figures in debates over the kind of commitments we undertake in asserting sentences. The book advances the following argument. The first is the role assigned to it by compositional semantic theory, where logical form is conceived as part of the input on the basis of which we grasp the meaning of sentences. The second is the role assigned to it by logic, where it is called upon to explain the validity of arguments, the logical relations of consistency and contradiction between asserted sentences, etc. Semantic theory, Iacona argues, cannot account for the logical validity of all arguments -- for instance, it fails when these arguments involve context-sensitive, vague expressions, and non-standard quantifiers. This is so since in such cases, the semanticist holds that content is only determined at a post-semantic stage, but there are, according to Iacona, distinctly logical properties that first show up when the full asserted content is in view. What is required to account for such cases is an alternative notion of logical form, according to which the bearers of logical form are not sentences of natural language but what we say by means of such sentences, i. This second notion of logical form, for its part, would not be suitable to serve the role reserved for logical form in semantic theories for reasons which will be made clearer below. Iacona concludes that there is no single conception of logical form which can adequately serve both the semantic and the logical roles. The first part Chapters consists of a historical study of the notion of logical form. Chapters lay out the central argument, described above. In Chapters Iacona develops the "truth-conditional notion" of logical form, according to which logical form is the property of content. The majority of the material -- Chapters -- has already been published in various peer-reviewed journals. The point of collecting these publications and combining them into a monograph is that taken together they lay out a single, unified argument. I begin by discussing the systematic arguments advanced in the second and third parts, and I then turn to discuss what I consider to be particularly problematic in the historical account offered in Chapters According to Iacona, semantic theorists of various stripes including Davidson, Montague, Lewis, Kaplan, Neale, Stanley, Borg, and others share the assumption that the notion of logical form that figures in semantic theory is also capable of explaining the logical properties and relations of sentences. But the semantic notion of logical form cannot fulfill this logical role, for instance, when it comes to sentences that involve context sensitivity. The semantic theorist that Iacona has in mind ascribes logical form to each of the sentences independently of the other, and independently of the particular context; this results in her not being able to account for the logical relations that are affected by the logical features of the context. By contrast, the "truth-conditional notion" of logical form takes the bearer of logical form to be the content expressed by a sentence on a particular occasion. Iacona does not commit to any particular theory of content, but shows instead that the truth-conditional notion would be compatible with various theories of propositions An important feature of this approach to logical form is that sentences of natural language do not perspicuously wear their logical form on their sleeves: This means that there is no such thing as "the" logical form of a sentence. Sentences have logical form relative to interpretations, because they have logical form in virtue of the content they express. Indeed, a linguistically competent speaker can fail to know the logical form of an argument. The apprehension of the logical form of s may require substantive empirical information. In the third part Iacona advances a series of arguments designed to show that the truth-conditional notion of logical form is preferable to the semantic notion when it comes to explaining a wide range of phenomena, including non-standard quantifiers, vague expressions, and equivocation. For example, consider how the two approaches to logical form diverge with respect to the treatment of non-standard quantifiers such as "more than half of". The semantic theorist will tend to simply deny that we can account for the validity of arguments involving these expressions in terms of logical form. But there is an intuitive sense in which such arguments are good in virtue of their form. On a particular occasion, we would not be led to error if we take the sentence 1 more than half of the professors in the philosophy department are happy, to yield the conclusion 2 more than two professors in the philosophy department are happy. Clearly, on a different occasion, 1 could be true while 2 is false, namely when there are only three professors in the philosophy department. But on this occasion, too, there would be some other inference that would seem valid, e. The goodness of each of these inferences, in their respective contexts, seems to depend on the form of what the sentences express. But since the semantic theorist ascribes to 1 the same logical form in all contexts, she is unable to explain these inferences as logical. Iacona seeks to convince us that such inferences are good by virtue of their logical form. He argues that despite the fact that "more than half of" is not first-order definable, it is "first-order expressible". By this he means that in any given interpretation, the logical form of sentence 1 can be captured by means of some first-order formula which embodies all the relevant logical properties that the original sentence has in that interpretation. Thus, in any interpretation there would be some cardinal number, such that for sentence 1 to be true in that interpretation is for the intersection of the set of professors and the set of the happy to be greater than that number. This general fact explains why we have the intuition that sentence 1 entails other sentences in virtue of its logical form p. The logical form of the content of sentences employing non-standard quantifiers will be different in different interpretations. According to the formal criterion of logicality that Iacona develops, these quantifier expressions therefore count as "non-logical" p. This is an interesting claim, though it may be wondered how one finds oneself in the awkward position of having to ascribe both logical form and non-logicality at one and the same time. Perhaps to be consistent Iacona had better avoid thinking of logicality in terms that tie it too closely to first-order logic. The first is that logical form is the structure which is revealed when we investigate the validity of arguments, by abstracting from the specific content of the sentences which make them up. The second is that in sentences of natural language, logical form is often disguised. In Chapter 2, Iacona describes Frege, Russell and Wittgenstein as proponents of what he calls "the old conception" of logical form. On the old conception, logical form can only be exhibited by a logically perfect language, in which the syntax perspicuously reflects the semantics p. This contrasts with a central feature of the "current conception" of logical form, which Iacona traces back to Tarski, Davidson, and Montague, in Chapter 3. The current conception is primarily concerned with the ascription of logical form to the sentences of natural language. The importance of this idea can be seen by considering two further issues that Iacona neglects. Form as such is a principle of unity; accordingly, logical form is that which binds thought or propositions together. A similar concern with the unity of the proposition leads Russell to propose that logical form is one of the elements which enter the relation of the judger to what is judged. There is a related issue which Iacona neglects. In both Frege and Russell, and even more explicitly in Wittgenstein, there is a concern with the very possibility of articulating the fundamental logical distinctions between the elements that make up a thought. Consider the sentence "a concept is not an object"; since "is an object" is a first order predicate, it only yields a senseful proposition when saturated by a name of an object, but by hypothesis, concepts do not fulfill the functional role of naming objects, so the sentence either fails to say anything about concepts, or it fails to make sense at all. Thus the form is not a constituent. On the view under consideration in the Tractatus, logical form is the underlying common structure of thought and reality. But since logical form informs all thought, it is not something about which one could have a proper theory, since we cannot occupy a standpoint outside it -- we cannot separate logical form from that which it informs. It seems to follow that attempts to ascribe or deny logical form to the expressions of our language or any language are irreparably nonsensical. To then say that natural language disguises logical form cannot mean, for Wittgenstein, that the result of clarifying the expressions of our language e. Rather, the clarificatory role of formalization is to dispel the confusions that arise when philosophers misunderstand language, in ways that encourage them to advance substantive metaphysical claims on the basis of their conception of logical form. Indeed, given the deep differences between the early-analytic approach to logical form and the approach adopted by philosophers of language in the second half of the 20th century, it might have been better for Iacona to avoid the historical discussion altogether, and frame his main argument more narrowly as a response to the way in which the notion of logical form is currently deployed. Iacona realizes this when he admits that it is not clear whether and to what extent Frege, Russell and Wittgenstein can be said to have shared the assumption that he wishes to reject p. Iacona sometimes expresses the central thesis of his book in the form of a sweeping claim: But put in this way the claim is more ambitious than what the argument warrants. What it seems to warrant are the two weaker claims that the notion of logical form deployed in semantic theory is insufficient for explaining all the logical properties we seem to ascribe to asserted sentences, and that there is another notion of logical form that can account for these logical properties, but is not suitable for a compositional-semantic theory. So, we may sum up the central thesis of the book more modestly, as follows: This is a thesis worth debating, and we should thank Iacona for furthering our understanding of the debate. Translated by Peter Geach. Edited by John Greer Slater.

7: Deductive Logic in Natural Language - Broadview Press

Andrea Iacona, Logical Form: Between Logic and Natural Language, Springer, , pp., $, ISBN Reviewed by Gilad Nir, University of Leipzig The notion of logical form plays various roles in contemporary philosophy.

8: Purdy : A logic for natural language.

Ling , Partee lecture notes, Unit II Supplement October Nov 2, , p. 1 1 Supplement to Logic Unit: Logical Structure in Natural Language.

9: Fred Sommers, The Logic of Natural Language - PhilPapers

To reach our main theme, we need to set a scene with two actors. We start with logical studies of natural language. Inspired by the methods of modern logic, the classical semantics of natural language focuses on truth conditions.

LOGIC OF NATURAL LANGUAGE pdf

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