

Interpreted logical forms: a critique

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Interpreted Logical Forms (ILFs) are objects composed of a syntactic structure annotated with the semantic values (objectual content) of each node of the structure. We criticize the view that ILFs are the objects of propositional attitude verbs such as *believe*, as this is developed by Larson and Ludlow (1993). Our critique arises from a tension in the way that sententialist and propositionalist assumptions are embedded in their theory. We argue that the instability in the theory that arises from this tension undermines Larson and Ludlow's claim that belief-reports can be individuated by distinctions in the form or content of ILFs. The locus of the problems we pose centers on how anaphoric relations are to play a role in determining discriminable properties of ILFs; we argue that Larson and Ludlow present no coherent theory of anaphora which mates with the notion that objectual content is part of the objects of belief-reports.*

1. *Russellian belief*

If one were to review current thinking about belief and belief-reports, it would appear that there is consensus around a particular 'Russellian' assumption about belief. This assumption is that the objects of belief – the things which people believe, or towards which they hold propositional attitudes – contain individuals as constituents, and it is this which distinguishes Russellians from, say, Fregeans or (strict) sententialists. Thus, if a speaker truthfully utters the sentence *Max believes Paderewski is a genius* to report Max's belief, then what Max believes is something of which the person Paderewski is a part. Those who hold this view can be divided into roughly two camps.

The first holds that the objects of belief are propositions. In the case above, this is a singular proposition, whose constituents are an n -ary sequence of objects and an n -ary relation, where the proposition is true if and only if the relation holds of the objects. Singular belief (to which we will limit our attention throughout) is then usually taken to be a relation between an individual and such a proposition, which holds just in case that individual is related to that proposition with respect to some conception of the constituents of the proposition, the *mode of presentation* under which the propo-

sition is believed. So, in the example above, the proposition believed is:

<Paderewski, **x** is a genius>

under, for instances, the mode of presentation of Paderewski as the famous Polish pianist. Believing this proposition in this way is to be related to it in a different way than believing it under the mode of presentation of Paderewski as the famous Polish politician. This is so even though the object of belief, the proposition above, is the same in both cases.¹

The second view is distinguished by holding that singular propositions do not exhaust the objects of beliefs, but must be augmented in some way. On this view, while individuals are still part of the objects of belief, there is something else which is also part of those objects, and what is believed may be individuated in terms of that something else. There are primarily two takes on the something else. One is that it is the modes of presentation, so what are believed are *quasi-singular propositions*, objects consisting of singular propositions whose constituents are paired with modes of presentation.² The second line, which eschews any role for conceptual modes, takes the something else to be some aspect of the linguistic form through which the belief is expressed. Just what aspect of the linguistic form is up for grabs, but contenders include linguistic entities such as words, or syntactic structures.

What draws together these various approaches is that they all maintain that individual objects are part of the *content* of a belief; it is this which marks them all as Russellian in the sense which concerns us here. Needless to say, in these brief comments we will not be attempting to adjudicate among the alternative ways of constructing a Russellian theory. We only wish to offer some comments on one particular version, a form of the second view described, offered up by Richard Larson and Peter Ludlow in their paper "Interpreted Logical Forms". The theory presented there can be stated quite simply: Propositional attitude verbs express relations between agents and a syntactic structure, each of whose nodes is annotated with its semantic value. Such annotated structures Larson and Ludlow call *interpreted logical forms* (ILFs).³ The predicate *believe*, for instance, expresses a relation between an agent and such an ILF; hence, the belief report *Max believes that Paderewski is a genius* is true just in case Max believes an ILF in which the NP *Paderewski* is annotated with the individual Paderewski.⁴ ILFs, on this view, are therefore the "objects of the attitudes"; they are complexes of syntactic structures (inclu-

ding words) and annotated semantic values, where the former constitutes an ILF's linguistic form, and the latter its objectual content.

Larson and Ludlow's approach can be classified not only as a type of Russellianism – in that the objects of belief can be individuated in terms of their content – but also as a type of sententialism, in that such objects can also be individuated in terms of their linguistic structure. Since attitude reports involve relations to ILFs, the truth-conditions of sentences embedding different ILFs will be different; this will be so regardless of whether this is a difference in content or a difference in form. "Two attitude reports", they state, "will be logically nonequivalent whenever their complement clauses are associated with ILFs that differ in either form or content". By this light, the sentences in (1) and (2) will have different truth-conditions, since even though the ILFs associated with the embedded clauses agree in content, they differ in form:

- (1) Max believes Judy Garland sang "Somewhere Over the Rainbow"
- (2) Max believes Frances Gumm sang "Somewhere Over the Rainbow".

What distinguishes Larson and Ludlow's approach is that the range of formal distinctions which can differentiate ILFs will include any distinctions based on abstract aspects of syntactic and lexical structure, as this is provided by our best (i.e. most empirically motivated) linguistic theory. This allows for extremely fine-grained criteria of belief individuation; insofar as ILFs can be so distinguished, beliefs can be as finely individuated as the language used to express them.

In developing such a fine-grained theory, however, Larson and Ludlow are not insensitive to the fact that beliefs may be more coarsely grained, in the sense that there are circumstances under which if an individual believes *p*, he may be reported truthfully to believe *q*, where *p* and *q* differ in their linguistic form, but agree in their objectual content. Thus, while (1) and (2) are distinct belief-reports, in virtue of their difference in linguistic form, there are circumstances, according to Larson and Ludlow, under which one or the other might be more appropriately used, where the range of useable ILFs is defined through invariance of objectual content. We discuss this aspect of their approach in section 4.

In Larson and Ludlow's view, ILFs are the objects of belief, and although, *qua* beliefs, they are believed whole, they fail to be unified in certain respects. There is a deep division which cuts across these

ted, in their particular sense of annotating logical forms of embedded clauses with semantic values, nor do they present a notion of *logical form* which is sufficiently (or appropriately) fine-grained, especially when faced with the problems posed by belief puzzles. Our discussion proceeds as follows. In Section 2, we examine Larson and Ludlow's argument for objectual content of ILFs in face of their commitment to sententialism. This sententialism is the topic of Section 3, in which we explore their notion of lexical item by reflecting on their treatment of belief puzzles. In Section 4, we look at the treatment of *de re* equivalence of belief-reports, and the role it plays in characterizing how a given belief may be reported, while Section 5 is devoted to Larson and Ludlow's treatment of demonstratives, and the content they contribute to ILFs.

2. The argument for interpretation

It is a hallmark of Larson and Ludlow's approach that any part of an ILF may make a difference in the truth-conditions of a belief-report, and although it usually goes along with a difference in content, a difference in form alone should be sufficient to distinguish belief-reports. Larson and Ludlow, however, do present one argument intended to demonstrate the independent role of the objectual component in distinguishing ILFs, and hence of the need for the 'interpreted' part of interpreted logical forms.⁶ It is based on the following examples:

- (3) Hans is brawny. Arnold believes he works out.
 (4) Franz is brawny. Arnold believes he works out.

According to Larson and Ludlow, the second sentences in (3) and (4) are 'identical in form'; yet, as they observe, they can report different beliefs. The first reports the belief that Hans works out, the second the belief that Franz works out; hence one might be a true report, the other a false one. But while they have the same syntactic form, the ILFs embedded in each differs – in the first one it contains Hans, in the latter, Franz, where these values are picked up and annotated to the pronouns in virtue of the anaphoric valuation of the pronouns. Thus, (3) and (4) are "attitude reports distinguished by content", not by form.

This account, we can observe, faces certain immediate difficulties. One arises from an assumption in Larson and Ludlow's theory

representations, cleaving between the linguistic and the objectual, and questions arise as to how one can stand in a relation to such a hybrid. ILFs contain occurrences of words, and words are public in the sense that distinctions among them are typically within the conscious ken of common folk – anybody knows that *Cicero* is a different word than *Tully*. But ILFs also contain linguistic aspects that surely are not public in this sense; for example, their syntactic structure. It would seem within the spirit of Larson and Ludlow's analysis to reply that ILFs need not be consciously public; if sharing a language is understood as sharing a set of rules and representations, common tacit knowledge of these would underwrite a different sense of public, and it might be argued then that ILFs are uniformly public in this sense, if only tacitly so. This does not suffice to unify ILFs, however, since ILFs are not entirely internal, mental objects. They are also in part external and non-mental, and neither the agent of belief, nor the speaker can be guaranteed epistemic access to the objectual annotations that the ILFs contain. A speaker can say that Peter believes that Cicero is not Tully, but clearly it does not follow that Peter has privileged epistemic access to the objectual annotations of the ILFs of the *that*-clause, since, if he did, he would know by virtue of such access that *Cicero* and *Tully* are co-valued and the ILF of *Cicero* is not *Tully* has false as its value. Similarly, the speaker might believe that Cicero is not Tully, agreeing with the belief he attributes to Peter. But by attributing a belief one cannot know its truth-value; one can know that Cicero is Tully, but not by inspecting ILFs. On the other hand, there are parts of ILFs, the identity of the words they contain, for example, which it seems fair to say, are accessible, at least to the speaker, being public in the usual sense. The conclusion to draw is that ILFs are not epistemically uniform. If to be an object of belief is to be an object that an agent or a speaker has an epistemic relation to, ILFs are not plausible candidates as such for that status.⁵

Larson and Ludlow's theory of belief-reports can be characterized as turning on a fundamental tension between the linguistic and the objectual. Thus, central to their approach will be how well it can handle cases in which one or the other of these is held constant – either where there is invariance of form, but not content, or there is invariance of content, but not form – since differences in form or content in themselves should be sufficient to distinguish belief-reports (and hence reports of different beliefs). Success with such cases will therefore be a metric of success of the overall theory. Our goal in this paper will be to evaluate the central cases Larson and Ludlow put forth to this end. The conclusion we reach is that Larson and Ludlow have neither successfully argued that logical forms must be *interpre-*

that it is not required that an ILF have an objective component; having or not having one distinguishes fiction from non-fiction. *Max believes that Holmes is a detective* and *Max believes that Poirot is a detective* report different beliefs according to Larson and Ludlow, but solely because they are of different linguistic form. All that distinguishes them is that one contains the name *Holmes*, the other *Poirot*; neither contains an individual as a constituent of the ILF of the embedded clause. Now, suppose that in (3) and (4) *Hans* and *Franz* are fictional names, just like *Holmes* and *Poirot*. There is then no objectual content associated with the pronouns in the ILFs, so that they are distinguished neither by their content nor by their form, and hence should report the same belief. But clearly they can still just as much report different beliefs of Arnold, just as they do with non-fictional names, or with the *Holmes/Poirot* examples.

A related problem, due to N. Hornstein, arises when, rather than not denoting, *Hans* and *Franz* denote, but denote the same individual. In this case, the belief-reports in (3) and (4) will have ILFs with objectual contents, but these contents will be exactly the same, and hence (3) and (4) will report the same belief. But this seems incorrect, since it still may be the case that one is a true report, while the other is not, for instance, if Arnold did not know that Hans and Franz were one and the same person.

Larson and Ludlow's response to this (footnote 11) is as follows: "We suggest that the pronoun in these cases is behaving as a 'pronoun of laziness' (Geach (1962)) going proxy for its antecedent expression. ... On our view, the Logical Forms for these sentences will actually contain the names in place of the pronouns". Thus, the belief-reports in (3) and (4) will have the same Logical Forms as (5) and (6):

- (5) Arnold believes Hans works out
 (6) Arnold believes Franz works out.

The reasoning is then that since it is the names themselves which appear in the ILF, this will be sufficient to distinguish the belief-reports as forms, even though the content does not.

In the context of Larson and Ludlow's approach, this response raises an immediate problem in that it simply gives up (3) and (4) as an argument for belief-reports distinguished by content, which was the original intent of these examples. This is because there is no reason why the pronouns should not also be pronouns of laziness when *Hans* and *Franz* denote different individuals, as opposed to denoting

the same individual, or no individual at all. But if they are, then even in this case the belief-reports can be distinguished simply by their forms. And this will be so regardless of whether "*Hans*" and "*Franz*" denote different, the same or no individuals; that is, of whether the ILFs have different content or not. In order for Larson and Ludlow's response to go through, it must be that the pronouns are *not* pronouns of laziness when their antecedents (i) actually denote something and (ii) they are non-coreferential. But one would have to argue for this most unusual constraint on the distribution of such pronouns.

Let us see, however, how we might reconstruct such a theory. Following Larson and Ludlow, let us consult Geach (1976: 26-7) for guidance:

As regards the semantic role of pronouns with antecedents, the term 'pronoun' suggests one account and the term 'back-reference' a quite different account. A pronoun may be regarded as simply *going proxy* for a noun or nounphrase: as replaceable in paraphrase by simple repetition of its antecedent or by a repetitious phrase some-how reconstructible out of the antecedent. On the other hand, a pronoun may be regarded as picking up and carrying on the reference made by the antecedent noun or noun-phrase: in medieval jargon, as making *recordatio rei antelatici*.

These two accounts are not incompatible; if the antecedent can be said to have reference, then this reference may be also ascribable to that repetition or near-repetition of an antecedent for which a pronoun goes proxy. But there are cases in which the repeated or nearly repeated antecedent could not possibly be held to repeat or continue the reference of the antecedent at its original occurrence: these are pure cases of what I have called *pronouns of laziness*.

The first thing to observe is that on Geach's account, the repetitions that Larson and Ludlow envisage are *not* pronouns of laziness, since when they are referential, they "repeat or continue the reference of the antecedent at its original occurrence", something which pronouns of laziness do not do. This leaves them with two options if they wish to implement Geach's approach: the *back-reference* option, applicable only if the antecedent has reference, under which the pronoun will just come to be associated with the value of its antecedent (which will then occur in the ILF), and the *going proxy* option, under which the pronoun will be linguistically replaced in Logical Form by a repetition of the antecedent, which will be associated with its value, if it has one, although this is not required.

Given a theory which makes this distinction between back-refer-

ence and going proxy, how would these notions be applied so as to obtain the results desired by Larson and Ludlow? One could perhaps proceed as follows: First, take the back-reference option, if possible; if not, take the going proxy option. This would leave the case in which *Hans* and *Franz* refer to different individuals distinguished by content, and would also take care of the case where *Hans* and *Franz* are fictional names. Since back-reference in the latter case is not an option, the pronouns would go proxy, and replacing the pronouns by the names would allow for the belief-reports to distinguished on linguistic grounds. It would not help, however, with the case in which *Hans* and *Franz* corefer, since here the back-reference option would be viable, and hence taken, leaving the beliefs undistinguished either by form or content. One might then modify the theory so that it is not conditionalized; rather, the strategy would be to take both options, and then see if one or the other makes a distinction. But this would allow the going proxy option for all the cases, and under this option all three will be distinguished by form, making the question whether they are also distinguished by content moot. (A third option would be to conditionalize the theory so that one first applied the going proxy option. But this would also wash out distinction by content, since this option is applicable regardless of whether the antecedent is referential or not.)⁷

The upshot of all this is that if Larson and Ludlow are to maintain that cases like (3) and (4) argue for belief-reports distinguished by content, they will need to develop an adequate theory of anaphora. Our remarks are intended to indicate the difficulty of this task, at least along the lines which they appear to favor. The alternative is to leave the work to the linguistic form, and let distinction by these features of belief-reports suffice. But then, as noted, this brings into question the reason for objectual annotation of logical forms in the first place.

3. Problems with belief puzzles

The linguistic form of ILFs, as we have seen, is to play a central role in the semantics of belief-reports on Larson and Ludlow's approach. Central to their concept of this form is a certain proposal concerning the form of words, or more precisely, of lexical items. In this section, we turn to a close examination of this notion.

Suppose that we have the sentence *Watson believes that Holmes fell off Reichenbach Falls*. By uttering this sentence, is a speaker attributing to Watson belief of the same ILF as a speaker who utters

Lestrade believes that Holmes fell off Reichenbach Falls attributes to Lestrade? It would seem that according to Larson and Ludlow the answer must be affirmative. This is because on their approach all we have to go on are the formal properties of the linguistic item *Holmes*, as it occurs in ILFs, and since these ILFs will not contain any individuals as constituents, it is this formal identity that solely counts for distinguishing the ILFs; no values are available to do the job. But then it would appear that Watson and Lestrade *must* be reported to have the same belief, since the ILFs which they believe are formally identical. But certainly it could be the case that Watson and Lestrade have different beliefs, for instance, if Watson's belief were about Sherlock, while Lestrade's were about Sherlock's brother Mycroft.

Larson and Ludlow are not without a response to this problem. Their response, which arises in their discussion of the case of *Cerberus*, a name purporting to refer either to the guardian of Hades, or to a talking aardvark, a character in a comic book, is of interest because it introduces their notion of how lexical items may be individuated. They comment that the truth of (7) depends on "which *Cerberus* was intended"; hence, "two distinct ILFs must be made available":

- (7) John believes *Cerberus* talks.

Although there is no apparent difference between the spellings of the two names, Larson and Ludlow nonetheless propose that the lexicon contains two formally distinct names, *Cerberus_I* and *Cerberus_{II}*. The diacritics are to be understood as part of the "spelling" of these names, so that they differ in just the way that *Cicero* and *Tully* do – the diacritics add just that much (phonologically null) information to the spelling *Cerberus* such that this is so. Larson and Ludlow consider this consequence reasonable, "given the independent need for syntactic discrimination between homophones in the ILF theory", indicating that homophones such as *bank* and *flier* also should be lexically distinguished by diacritics. *Bank_I* and *bank_{II}*, on this view, are to be distinguished in exactly the same way as, say, *table* and *chair*.

Larson and Ludlow push their proposal one step further, arguing that it affords an account of the puzzle surrounding pairs of belief-reports such as (8) and (9):

- (8) Peter believes that Paderewski had musical talent
 (9) Peter doesn't believe that Paderewski had musical talent.

As (8) and (9) stand, they appear to be contradictory, each embedding (tokens of) the same ILF. However, as Kripke (1979) first observed, (8) and (9) both may be true, given that Peter believes there are two people with the name *Paderewski*, one a musician, one a politician (even though there is, in fact, just one person Paderewski). But, as with *Cerberus*, it is possible to take (8) and (9) as embedding distinct ILFs, differing in that one contains the name *Paderewski*, and the other *Paderewski*_{II} (although they will have the same objectual content).⁸ By this light, (8) and (9) are no different as belief-reports than *Peter believes that Judy Garland had musical talent* and *Peter doesn't believe that Frances Gumm had musical talent*.

By the logic of Larson and Ludlow's theory, if the occurrences of *Paderewski* are distinguished diacritically, understood as part of lexical spelling, (and given that spelling is a formally discriminable feature of ILFs), then it certainly follows (i) that (8) and (9) are not contradictory and (ii), given their sententialist assumptions, that (8) and (9) can report different beliefs, since they embed formally distinct ILFs. While there is something to these conclusions that strikes us as correct, we harbor doubts about the correctness of the antecedent. We do so because of our skepticism about Larson and Ludlow's central assumption – that the distinctions in hand hold in virtue of *lexical* diacritics. Is it really so clear that homophonic names are comparable to homophones like *bank*? If a speaker does not know that there are two words *bank* in English, it seems correct to say that the speaker's knowledge of English is incomplete; that there is a gap in his or her lexicon. But suppose that a speaker has never read about the talking aardvark, but has read about the guardian of Hades. That speaker will have in his or her lexicon just one name *Cerberus*. Or suppose we have a speaker who, while well-versed in ancient philosophy, studiously avoids the world of commerce. That speaker will have in his or her lexicon just one name *Aristotle*, as he knows only of the author of *De interpretatione*, and nothing of the shipping magnate and erst-while lover of Maria Callas. Is it reasonable in these cases to hold that that speaker's knowledge of English is incomplete? Surely not. What these speakers do not know are not matters of English, but matters of fact: that there are two fictional characters, or that there are two people, that have the same name.

There is a further consequence of the lexical assumption that seems to us telling. Since diacritics can be used to distinguish homophonic non-empty names (as well as empty ones), there will be for each bearer of a name, a distinct *lexical item* which is his or her name. So, there will be at least as many names *Judy Garland*, for instance, as there are people bearing that name. This claim does not

strike us as *prima facie* correct – couldn't it be that there is only one name spelled *Judy Garland*, which many different people share? This certainly accords with common usage, for instance, when one says "There are many people named 'Judy Garland'", which is intuitively true, yet comes out as false on Larson and Ludlow's account, since names of distinct individuals are distinct names, and hence no two individuals have the same name.

Now what of Paderewski? Can he have two lexically distinct names *Paderewski*, which are distinguished solely by diacritics? If names are shared in the sense just described, so that there is only one spelling *Paderewski*, of course the answer is no. There is reason to believe that this is the right answer given that (10) is implied by (8) and (9):

(10) Peter believes that there are two people named "Paderewski"

According to Larson and Ludlow, (10) is also false, since what resides within the quotation marks is either *Paderewski*_I or *Paderewski*_{II}, and Peter would believe that each of these accrues to only one individual. So it would seem that they must maintain that Peter is just wrong to believe that there are two people named *Paderewski*.

The nature of the problem here can be seen from a further example. Suppose that all parties concerned, the speaker, the hearer and Peter, believe that there is one name "Paderewski", and moreover that each believes the others believe that there is one name "Paderewski". (Independently, they may or may not believe it is borne by more than one person.) The speaker can still perfectly well assert (8) and (9), without attributing any logical inconsistency to Peter. Given this, it follows, if the distinctions are to be made diacritically, that no one can have conscious access to the diacritic spellings of the names, not Peter, the speaker nor the hearer. It seems that they are all *wrong* to believe what they do, that there is one name "Paderewski".

The conclusion to draw from this would appear to be that the diacritics must be part of the linguist's *account* of names, and *tacitly* known, if known at all. But if this is how diacritics are known, it is at odds with other views Larson and Ludlow hold regarding how one arrives at the proper language to use in reporting a belief. According to them "expressions used in attitude ascriptions will be tacitly 'negotiated' by participants in the discourse, following quite general principles holding of discourse of all kinds" (p. 341). Since the diacritics are part of expressions so used, it would appear that the diacritics are subject to negotiation between the speaker and hearer. In effect, they

must be negotiating the spellings of the names that will be used. But why should two spellings that are overtly identical and only diacritically distinct be the outcome of such a negotiation? Moreover, how would the negotiation proceed, given that the participants, as just described, have no conscious awareness of the terms of the negotiation – the diacritic spellings – and are, to the contrary, consciously of the belief that there is only one spelling. The speaker, after all, would be willing to assert that Peter believes that two people have the same name. How can the speaker and hearer be negotiating if they don't believe there is anything to be negotiated? This is unlike deciding whether to use *Cicero* or *Tully* in reporting a belief about the Roman, since in this case the speaker and hearer would consciously believe there are two names.

We believe that these considerations undercut the view that the problem is pragmatic in character. It makes sense to say, as Larson and Ludlow do, that a speaker's choice of terms may depend on the speaker's beliefs concerning the interests of the hearer. Beliefs of this sort can, in principle, be made conscious. But the sort of negotiation Larson and Ludlow propose is an *unconscious* negotiation, based on tacit knowledge running counter to the negotiator's conscious beliefs. We are at least owed an indication of how such a pragmatic account would proceed, since it would seem *prima facie* that the terms of the account would not be those in which a pragmatic theory would truck.⁹

4. *De re belief-reports*

There is a clear intuition that a speaker, in making a belief-report, is not limited to doing so in terms which the agent of the belief would recognize as reporting his belief. Thus, it is not hard to imagine circumstances under which one could truthfully utter *Max believes Cicero is a Roman*, even though Max may have never heard of anyone named "Cicero", and would only assent to believing that Tully is a Roman. Any theory of belief-reports worth its salt, one would assume, would have to be able to provide some reasonable account for this intuition.

Larson and Ludlow approach such an account (in section 7.2 of their paper) in the following way. A communicative interaction can be thought of as proceeding with respect to a sort of social contract, by which the interlocutors "negotiate" the terms under which a conversation takes place. This negotiation will take into account various factors pertaining to how to best realize the communicative

purposes of the speaker and hearer. Thus, since a speaker will utter what he believes best gets across what he wishes to say (in the case at hand, the belief he wishes to report), he will use whatever linguistic form which he thinks best expresses *to the hearer* the belief being reported. So, suppose that the speaker and hearer are interested in reporting a belief in the terms under which the agent believes it; that is, what he believes *de dicto*. To truthfully do this, the speaker will utter a sentence whose embedded ILF is the same as that with respect to which the agent holds his belief, (since the linguistic form used to convey a belief figures in the truth-conditions of a report of that belief). In the case described above, the speaker's utterance of *Max believes Cicero is a Roman* will therefore be false, as opposed to *Max believes Tully is a Roman*, which would be true.

Now, of course, a negotiation which results in a *de dicto* belief-report cannot be the only sort, since then the original intuition would be left unaccounted for. What Larson and Ludlow need to do is to characterize a more general notion of what it is to be a *kind* of ILF, such that any token ILF of the kind will issue forth in a belief-report that allows a speaker to truthfully report an agent's belief to a hearer. The central question then becomes by what criteria can such kinds be determined?

Larson and Ludlow's answer to this question stems from their characterization of what it is for belief-reports to be "logically equivalent attitude reports":

... two distinct attitude reports α and β will be logically equivalent when the following two conditions are met: (i) the values assigned to the subparts of the complement clauses of α and β are identical (that is, α and β differ at most in the forms of (some of) their subconstituent parts); and (ii) α and β are evaluated under structures in which their formally distinct (but corefering) subparts are given scope outside of the complement clauses, beyond the highest attitude verb (p. 322).

In accordance with (i) and (ii), Larson and Ludlow derive (11) and (12) by syntactic movement:

(11) Judy Garland₁ [Max believes [_t sang "Somewhere Over the Rainbow"₁]]

(12) Frances Gumm₁ [Max believes [_t sang "Somewhere Over the Rainbow"₁]].

Since the trace t_1 will be paired in the embedded ILFs with the same objectual content, and since these ILFs do not differ in linguistic form, Max will "stand in the believe-relation to one and the same object".¹⁰ (11) and (12), therefore, embed identical ILFs, and it is this identity which defines them as being of a given kind. Moreover, because of the identity of objectual content, (11) and (12) are equivalent as *de re* belief-reports, and in virtue of being *de re* equivalent, they will have identical truth-conditions. As such, either can be used to truthfully report Max's belief. Similarly, in the case above, the speaker's utterance of *Max believes Cicero is a Roman* will be true, as a *de re* belief report; it doesn't matter that he has not used the words under which the belief is held by the agent, for this holds no privileged or favored position relative to any other *de re* equivalent report. Any report embedding an ILF with the proper content could do the job; choice among them will be a result of the communicative contract in force.¹¹

Larson and Ludlow's account of belief reporting turns crucially on being able to fix the strict identity of ILFs, in virtue of which they obtain a notion of *de re* equivalence. Now, for such identity to hold, it is necessary that all the formally discriminable aspects of the ILFs be the same, that they be of the same shape – xerox copies, if you will. This includes, one would assume, the occurrences of (formal) variables, as this is indicated by the coindexing of the traces in (11) and (12).¹² However, there is nothing within syntactic theory (trace theory) from which the requisite formal identity follows; that is, that the traces in the two sentences (and their binders) must be coindexed. They could just as well bear different indices, so that we could have (12') instead of (12):

(12') Frances Gumm₂ [Max believes [i_2 sang "Somewhere Over the Rainbow"]].

It would appear clear from Larson and Ludlow's remarks that the embedded ILFs in (12) and (12') do not satisfy the formal identity condition, because of the difference in indexing. Formal identity between the ILFs in (12) and (12') no more follows than if we had *Cicero* and its trace with the index "3" in the place of *Frances Gumm* and its trace. But, if we can have (12') alongside (12), a question arises as to how *de re* equivalence can be defined through formal identity of ILFs, since (12') just as much reports a *de re* belief as (12); indeed, it must report the very same belief, since there can only be one *de re* belief of Max's with regard to that person Judy Garland/Frances Gumm (singing "Somewhere Over the Rainbow"). So,

while belief-reports which embed identical ILFs are certainly *de re* equivalent, there are also belief-reports which are *de re* equivalent which do not embed identical ILFs. *De re* equivalence cannot be reduced to identity of ILFs.

There are a number of courses of action open at this point to eliminate (12'). One could, for instance, adopt a (discourse) principle stating that if two names have, as a matter of fact, the same value, then they have the same syntactic index under movement. This would exclude the pairing of (11) and (12') in favor of (11) and (12). If this course were to be taken, however, problems of formulation would loom large, as one would face the daunting task of having to justify why syntactic indexing under movement should be under such semantic control. Alternatively, one could take the view that traces have no indices at all. Since traces would be "bare" in this sense, there of course would be no way to draw a distinction in ILF between (12) and (12'). This, however, would have far reaching consequences with respect to the semantics which Larson and Ludlow propose, in which the quantificational clauses crucially turn on correspondence between a variable bearing an index i and variation with respect to the i^{th} -element of a sequence (i.e. ordinal position).

A third possibility would be to hold that the role of the indices in distinguishing variables are just as bookkeeping marks; they are not semantic terms in the sense that names, for instance, are. Hence, although they are syntactically present, they are not the sort of things which would figure into evaluating whether ILFs are identical or not, and hence would be indiscriminable parts of ILFs. Now, assuming that the technical details of this suggestion could be properly worked out, this proposal might seem attractive. There is, however, an inconsistency in Larson and Ludlow's treatment of *de re* belief reports that the proposal does not overcome.

Larson and Ludlow observe that formal distinctness of ILFs can serve to distinguish not only belief-reports with names such as *Judy Garland* and *Frances Gumm*, but also comparable examples with predicates. In this regard, they introduce the following examples:

(13) Max believes Mary xeroxed *War and Peace*

(14) Max believes Mary photocopied *War and Peace*.

On pages 331-32, and in their footnote 30, Larson and Ludlow make it clear that the *de dicto* non-equivalence of these belief-reports turns for them on the formal distinction between the words *xerox* and *photocopy*, distancing themselves from a Russellian view in which the

"coextensive predicates" *xerox* and *photocopy* denote different relations (particular universals). On that view different relations would appear as parts of the propositions expressed by the complements in (13) and (14), and failure of substitutivity would follow as a consequence. Their argument is ontological; they argue that no such entities as properties and relations need be appealed to in their theory, the task being equally well discharged by "homey entities such as words".

The problem arises once we observe that (13) and (14) are fully comparable to (11) and (12); while not *de dicto* equivalent, they are *de re* equivalent. With (11) and (12), this follows. Since the formally distinct but corefering subparts are given scope outside of the complement clause, and the traces left behind are covalued, the ILFs will count as logically equivalent by criteria (i) and (ii), with the indices on the traces left behind now irrelevant (as "bookmarks") to whether the criteria are satisfied. This procedure, however, does not apply, according to Larson and Ludlow, to (13) and (14). They note, correctly, that there are well-understood syntactic conditions that prohibit moving a verb, so that neither (15) nor (16) are to be countenanced:

(15) [_v *xerox*]₁ [Max believes [Mary t₁ *War and Peace*]]

(16) [_v *photocopy*]₁ [Max believes [Mary t₁ *War and Peace*]].

The problem, then, is to give an account of the *de re* equivalence of (13) and (14). Since scoping out the predicates is not an option, Larson and Ludlow must give some other account of *de re* equivalence that ignores the formal difference between *xerox* and *photocopy*. But if that were done, the question would then come as to why one could not do the same with names, so as to ignore the formal difference between in the *Judy Garland* and *Frances Gumm*, and accordingly dispense with the scopal analysis altogether. But if they were to hold as a criterion for *de re* equivalence that if two expressions are coextensive, the formal distinctions between them could be ignored, they would clearly not be providing an analysis that provides any specific support for the ILF view. At this point, one might question what role would there be for formal identity of ILFs above and beyond their identity of content, leaving at issue only what determines the appropriate linguistic dress in which to clothe a content such that it best serves the communicative purposes at hand, an issue for any theory which gives primacy to objectual content. Thus, although it appears to be their goal to cash in *de re* equivalence in terms of formal identity of ILFs, their attempt fails, since, whatever Larson and Ludlow

might say concerning the treatment of indices, they cannot accommodate both the *Frances Gumm/Judy Garland* examples and the *xerox/photocopy* examples.¹³

5. Demonstrative content

In our discussion to this point, we have assumed that the content of a belief-report is exhausted by objectual content. But, according to Larson and Ludlow, there is another sort of case which brings non-linguistic content to bear on distinguishing belief-reports, although not by objectual content. Their example is (17), which they take to be ambiguous, between "ascrib[ing] to Max little more than a grasp of self-identity" and "ascrib[ing] to him belief about a significant empirical truth":

(17) Max believes that planet is that planet.

The difference in the readings emerges when (17) is uttered "at a normal rate, and gesturing twice", the latter when, (adapting an observation of Kaplan's), it is uttered sufficiently slowly so that the first demonstrative is uttered accompanied by ostension to Venus in the morning, the second with ostension to Venus in the evening. The rub is that at least the latter reading does not appear to be characterized by the embedded ILF, since there is no difference in either the linguistic form or the objectual content of the demonstratives.¹⁴

What Larson and Ludlow suggest in way of an account is that demonstratives are individuated through the events which constitute acts of demonstration, and that these events make up part of the content of ILFs, along with the object demonstrated. (More precisely, they suggest that the semantic *value* of a demonstrative is a pairing $\langle x, e \rangle$ of an object and an event.) (17) will then have the desired property, they claim, in virtue of the demonstratives corresponding to different acts of demonstration, since in the ILFs, they will be associated with different eventive content. The problem now, however, is that we seem to have lost the account of (17) on the other, trivial, reading, since there seem to be just as much two acts of demonstration (to the same object) regardless of whether (17) is uttered rapidly or slowly – since there are two demonstratives, there are two acts of demonstration, and hence two demonstrative events.

It is not altogether clear how Larson and Ludlow are to make the distinctions they desire. Obviously difference of referential value cannot be appealed to, since all the demonstratives have the same

