1. Introduction

Semantics is "a notoriously slippery business" (Barwise and Perry (1983: 3)). There is no consensus about what counts as "meaning," and hence about what it means to make the correct semantic prediction. The disagreement can be illustrated using the following schema:

(1) external reality ------ cognitive agent ------ linguistic meaning

Obviously, utterances and understandings of expressions in the language in question depend on the cognitive agent's (i.e. the language user's) grasp of external reality, which often is biased and deviates from the objective way the world is. Sometimes we encounter the claim in the formal semantics or analytic philosophy literature that the agent may be wrong about the meaning of the expressions he or she uses, a claim which amounts to rejecting (1) in the first place, in the sense that the world and meaning are directly connected, not being mediated by the agent, in which case the desired prediction for a declarative sentence

* I would like to thank Yasuo Nakayama for an instructive discussion on the A- and the B-theories of time. I would also like to thank two anonymous reviewers for insightful comments and suggestions for improvements of exposition. The usual disclaimer applies.

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would be its truth condition (either in the form of a Tarskian statement in a meta-language or a model-theoretic interpretation). In contrast, if (1) is accepted, one could ask whether the agent’s grasp (psychology) of the world (metaphysics) is biased (by the way cognition works) in a linguistically interesting way. If it is, we will expect linguistic semantics to reflect such biases, which should be part of the desired prediction.¹

On the other hand, note that a theorist is an outside observer, and hence is naturally expected to describe things from an outside perspective, rather than that of the language user. A theorist is justified in talking about external reality, even if human grasp of external reality is indeed biased, to the same extent that an experimental psychologist is justified in saying that such and such an external reality produces such and such an erroneous visual or auditory perception, even if the perceptual mechanism is shared by the subjects and the psychologist himself or herself. In many cases the theorist and the agent can safely be equated, but theories could differ as to where the distinction between the two becomes crucial.

In this article I attempt to locate the book under review in the context of the above general discussion. The book claims (A) that temporal expressions in natural language are best analyzed in terms of what philosophers have called the A-theory of tense, as opposed to the B-theory, and (B) that the study of natural language semantics reveals metaphysical truths. Combining (A) and (B), the book derives the claim that the correct metaphysical theory of time is the A-theory. As we will see, (B) does not really go very far beyond Ludlow’s initial premises. My main argument will be that Ludlow’s argument for (A) is flawed due to his failure to separate the cognitive agent and the theorist where he should have; if the two are separated clearly, a different picture will emerge.

In Section 2, I outline the author’s general line of argument, instead of giving a chapter-by-chapter summary. (See Sandstrom and

¹ Although the classical position of formal semantics is to reject (1), some formal semanticists do accept (1), in which case the truth condition will be with respect to the model of the agent’s understanding of external reality. But they usually do not find much theoretical interest in the way human cognition is biased. For example, Asher’s (1993) position can be seen as an instance of such an attitude.
Ingthorsson (2000) for such a summary.) Occasionally I add some comments, but a more critical examination of the author's argument is given in Section 3. Section 4 concludes the review.

2. The General Picture of the Book

Ludlow's strategy is to establish (A) by arguing that:
(2) The B-theory cannot deal with certain phenomena.
(3) What have been pointed out as defects of the A-theory can be overcome.
(4) Only the A-theory is compatible with certain findings in first-language acquisition and acquired language deficit research.

His whole argument has three premises: (5)–(7).
(5) Meaning is the language-world connection.
(6) Meaning should be analyzed in terms of Tarskian truth conditional statements, as opposed to model-theoretic interpretations or mental representations.
(7) "[A]n I-language" in the sense of Chomsky (1986), which is "a state of an internal system which is part of our biological endowment" (p. 17), is the language in which we think (the language of thought).

(5) is a real premise, assumed with no argument, while Ludlow attempts to justify (6) by giving philosophical arguments (Ch. 2), which we do not examine in detail, except noting that his argument against the "mental representations" alternative does not really go far beyond (5). (7) is presented as a "possibility" (p. 14); Ludlow attacks what he conceives as possible objections but does not give positive reasons to adopt it (Ch. 1 and Philosophical Appendix P1).

Let me add one note about (7). Ludlow talks about the notion of I-language as if the "I" in "I-language" stands for "innate," in addition to "internal" and "individual," by adding the relative clause "which is part of our biological endowment." Of course, an I-language is only the result of a particular combination of parameter settings, an option allowed by UG, but is not UG itself. Thus, if an I-language in this sense is the language of thought, (7) could amount to saying that speakers of different languages think differently and conceive the world differently (the traditional interpretation given to the Sapir-Whorf Hypothesis, discussed in the Preface), a consequence Ludlow would def-
initely reject, given (B). The point here is that Ludlow assumes that LF does not differ significantly cross-linguistically. As is particularly clear from Philosophical Appendix P1, when he says that an I-language is the language of thought, Ludlow has LF in mind, not PF or syntactic Merge or Move operations, etc. (Ludlow has only MP-style grammar in mind when he says “linguistic theory”; other frameworks such as LFG, HPSG, and Cognitive Grammar are ignored throughout.) Thus, the emphasis is not on possible differences between languages.

Given (5), the semantic structure is assumed to reflect the structure of the metaphysical world, and thus studying the former should reveal something about the latter. This is exactly what (B) says. Thus (B) does not go very far beyond the premise (5). Although Ludlow gives the impression that (B) is part of the main claims of the book, it is nothing more than a premise, in fact; rather, the main argument is (A).

One could adopt (5) and still reject (1) (see Section 1 above). However, with (7), Ludlow accepts (1) and puts the language user (cognitive agent) in the overall picture. The general consequence of this acceptance will be discussed in the next section; for now, let us examine his particular arguments. Throughout this review, simply in order to avoid unnecessary technical details, I make non-significant simplifications to the truth conditions Ludlow gives, which should ultimately be given as an Interpreted Logical Form (an LF tree whose nodes are assigned semantic values).

2.1. The A- and the B-Conception of Time and Temporal Expressions

There are two ways to conceive time. The A-conception is to conceive temporal entities in terms of such notions as past, present, and future. Under this conception, a given event was a future event (before

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2 This narrow-mindedness may have affected his arguments. For example, his attack on Jackendoff’s (1992) claim that “conceptual representations” are not part of “narrow syntax” at least partially depends on his assumption that “straight syntax” must refer to either LF or PF, if the term “means anything,” because these are the representations we have in “current linguistic theory” (p. 167). However, in the parallel grammar architecture Jackendoff (1997) argues for (or HPSG or LFG, for that matter), syntax is a separate component independent of semantics and phonology. Whether an MP-style derivational architecture should be assumed instead of, say a Jackendoff-style parallel architecture, is a matter of debate, not something to be presupposed.
the event happens), is a present event (when it is happening), and will be a past event (after it has happened). Thus, linguistic descriptions of events based on the A-conception are intrinsically “tensed.” In contrast, the B-conception is to conceive them in terms of such notions as earlier than, simultaneous with, and later than. Under this conception, a given event is earlier, is simultaneous with, or is later than, an utterance reporting that event, where by is I mean the “tenseless version” of is.3 (Such a “tenseless version” is a philosopher’s theoretical construct, not something observed in non-philosophers’ English.) The temporal relations among events do not change as time passes. Thus, linguistic descriptions of events based on the B-conception will be “untensed.”

The above characterization of the A- and the B-conception is more or less general and will allow several interpretations. One possible interpretation, not adopted or even considered in the book under review (but argued for in Section 3 of this review),4 is that they are different strategies to conceive time adopted by cognitive agents or theorists: the A-conception is a perspective-dependent way to conceive temporal locations, while the B-conception is a perspective-independent way. Another interpretation, the one adopted in the book under review and the philosophy literature, regards them as different theses about the ontological nature of time: the A-conception says that events are intrinsically changing tensed entities, while the B-conception says that time is “frozen sequences of unchanging events” (p. xv).

2.2. The Problems for the B-Theory

Ludlow argues that the B-theory semantics of temporal expressions suffers from two problems. A solution to either one of them could be easily given, but crucially, he argues, either would automatically prevent the solution to the other (Ch. 6).

One of the problems concerns the indexical nature of temporal expressions. For example, someone might say (8) to himself:

(8) My fifth anniversary is March 12. (p. 7)

He thinks now that he “should think about buying [his] wife an anniversary present” (ibid.). Wondering how much time he has, he

3 This is my own notation, invented for the purpose of this review.
4 A similar interpretation can be found on p. 109 and p. 140, but the author’s whole argument does not seem to rely on it.
“take[s] out a calendar” (ibid.), only to find today’s date and shouts:

(9) My fifth anniversary is today! (ibid.)

Let S be the date when the sentence in question is uttered. Let R be what the expression my fifth anniversary denotes. Then, according to Ludlow, a straightforward B-theory semantics forces us to say that the truth conditions of (8) and (9) are B1 and B2 respectively:

B1: (8) is true iff R is March 12

B2: (9) is true iff R is S

However, since “March 12 is identical to [S]” (p. 88), B1 and B2 are indistinguishable truth conditions, which amounts to predicting (by (6)) that (8) and (9) are synonymous, a clearly undesirable prediction.

The B-theorists could solve this problem by invoking the idea of “token reflexive” truth conditions, truth conditions involving an explicit reference to the utterance of the sentence in question. The token-reflexive truth conditions of (8) and (9) would be something like B1’ and B2’ respectively:

B1’: An utterance of (8) at time t is true iff R is March 12.

B2’: An utterance of (9) at time t is true iff R is the day of t, the time of this very utterance.

Note that one could understand B1’ without knowing the accidental fact that the date of the utterance happens to be March 12. In contrast, the RHS (right-hand side) of the biconditional B2’ explicitly mentions the utterance itself. Such utterance-relative truth conditions do not wrongly rule out the possibility that (9) is rejected by those who accept (8) (if they happen not to know that today is March 12).

However, according to Ludlow, such a solution makes the wrong prediction for sentences like the following:

(10) There is no spoken language.

By giving something like the following truth condition for (10), the token-reflexive approach would succeed in correctly predicting that (10)

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5 Following Ludlow, I abbreviate “right-hand side” to “RHS.” He uses this abbreviation without explanation. It is more or less obvious and not likely to cause much difficulty for the reader, but the same cannot be said of his “Val” predicate. This is initially introduced as a two place predicate (p. 33), but on p. 51 we suddenly find a three place predicate Val, with no exposition of the third argument; only informal, case-by-case expositions of the third argument are given later. Perhaps, one should read Larson and Segal (1995) beforehand to understand what Ludlow takes for granted.
is false:

B3': An utterance of (10) at time t is true iff there is no spoken language at t, the time of this very utterance.

But the problem is, according to Ludlow, that it would wrongly predict that (10) is necessarily false, a prediction already pointed out in the philosophy literature to be unavoidable by replacing the two occurrences of "utterance" in B3' above with "tokening (verbal or mental)." The only way to avoid this prediction is to give up the idea of explicitly mentioning the time of the utterance on the RHS:

B3': An utterance (tokening) of (10) at time t is true iff there is no spoken language at t.

However, this leads to a dilemma. If we give up the idea of mentioning the utterance (or tokening) on the RHS, in order to avoid the wrong prediction for (10), we would make the wrong predictions for (8)-(9). However, if we preserve the solution to (8)-(9), then we would be unable to avoid the wrong prediction for (10). Thus, Ludlow says, the B-theory is doomed to fail either way.

2.3. Solutions to the Traditional Problems for the A-Theory

Ludlow defends A-Theory against the two most serious objections to it: the problem of temporal anaphora and complex tense, and the McTaggart Paradox (Ch. 7).

2.3.1. Temporal Anaphora and Complex Tenses

In many cases we would want to talk about reference to a past or future moment of time. For example, one might utter (11), meaning not that there was at least one past moment on which Barbara turned off the stove, but rather that there was a particular past moment (say t) at which she turned off the stove (temporal anaphora).

(11) Barbara turned off the stove.

Or, according to the traditional analysis (either in traditional grammar or in much of the formal semantics literature), past perfect sentences denote a time "before some past time (say t) before the utterance" (complex tense).

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6 A possible exception is Kamp and Ryle (1993), who attempt to analyze past perfect sentences as expressing past states (but in addition accept the traditional analysis).
Straightforward implementations of such an analysis of (11)–(12) would involve explicit reference to t. However, this is prohibited by the particular version of the A-theory Ludlow wants to justify, presentism, the thesis that our talk about past or future events "does not involve our referring to future and past events or to there being such events for us to refer to" (p. xv) and "what makes something future or past is how the world stands right now" (ibid.), or more briefly, the rejection of "the reality of future and past events" (p. 142). Thus, Ludlow has to get rid of such an explicit reference to t (as long as he accepts the above general analysis, which he does).

Implementing the A-theory conception of tense in terms of tense operators, Ludlow accomplishes this task by positing that every tensed sentence has an implicit (E-type) temporal adverbial clause, with the constraint that the implicit clause and the sentence to which it adjoins must agree in tense; (11)–(12) will then be analyzed as something like (13)–(14) respectively:

(13) \( \text{PAST(Barbara's turning off the stove) when PAST(…)} \)

(14) \( \text{PAST(Smith's drawing a circle) before PAST(…)} \)

The implicit \textit{when/before} clauses express general propositions, in the Russellian sense that a "general proposition" does not contain an individual (here, t) as a constituent found in a corresponding "singular proposition."

Ludlow discusses applications of this implicit-clause analysis to several other technical problems: the avoidance of nesting tense operators, a tense frame introduced by a nominal, and the Sequence of Time phenomena. Owing to space limitations, I shall merely note that his application of the technique to the nominal tense frame issue has a technical flaw.

Enc (1986) observes that nominals often "pick up some time frame that is independent of" the main predicate of the sentence (p. 130). For example, the people talked about in (15) are quite likely to have been hostages before the visit:

(15) The hostages came to the White House.

Extending Bach and Cooper's (1978) analysis of relative clauses with multiple heads, Ludlow posits an implicit relative clause inside the subject (p. 131):

(16) \([NP [NP The hostages] [S (who were captured in the US Embassy during the Iranian revolution)] came to the White House)]\)
However, the constituent analysis in (16)—in which the implicit relative clause takes the form of an English-style head-external relative clause, as opposed to a head-internal relative clause found in such languages as Japanese—does not really succeed in trapping the nominal predicate’s semantic contribution in the relative clause’s temporal frame, since the nominal head is outside the relative clause.\footnote{One possible remedy for this technical defect that yet respects Ludlow’s general idea would be to analyze the hostages as something like those who were hostages when they were captured in the US Embassy during the Iranian revolution. While this alternative implementation of the general proposal incidentally respects the spirit of Bach and Cooper’s proposal more than Ludlow’s own, it requires some powerful syntactic mechanism to link the overt expression and the semantic representation, in the latter of which the hostages cannot be found as a constituent.}

The characteristic that deserves more attention is his claim that he is thus able to avoid reference to past time. Ludlow argues that (17), which is intuitively felt to involve reference to the past date, should be analyzed as (18), in which July 4, 1995 is merely a predicative constituent (p. 125):

\begin{enumerate}
\item (17) The last class is July 4, 1995.
\item (18) The last class is when [...] July 4, 1995.
\end{enumerate}

It may or may not be intuitively clear what (18) claims about the world; Ludlow gives no further exposition of (18). And the claimed success of (18) in getting rid of explicit reference to the date crucially depends on the assumption that a predicate is not a referring expression on this theory (Ch. 2). The claimed avoidance of reference to past (or future) time is accomplished not solely by the implicit adverbial clause analysis; it still needs the help of such a paraphrase game, in which the rules are: (i) if you express something as a nominal expression on the RHS of your truth conditional statement, then that is a referring expression, but (ii) if you paraphrase it with a predicate then you can avoid reference and the accompanying existential commitment.

2.3.2. The McTaggart Paradox

Just as a single table cannot be both round and square, for example, nobody will accept the inconsistent statement that something is both a past event and a future event. However, according to McTaggart (1908), the A-theory entails such inconsistent statements. An event E
"will at some point be past, at some point present, and at some point future" (p. 105). Therefore, according to McTaggart, we are led to:

(19) future(E) & past(E) & present(E)

Surely, one would say, this argument sounds absurd; one is not saying that E has the properties "future," "past" and "present" at the same time. For example, if E is my writing this review, I would say something like:

(20) E was a future event (a year ago) & E is a present event (now) & E will be a past event (next year)

One would find no inconsistency in (20). McTaggart anticipated this counterargument, which he deals with by claiming that it leads to an infinite regress. He first paraphrases (20) as something like (21):

(21) E was a future event at some past moment, is a present event at the present moment, and will be a past event at some future moment.

No moment is intrinsically a past, present or future moment. Thus, if the moment M is present now, it was a future moment (before) and will be a past moment (in the future); hence we obtain (22), the same inconsistency as found in (19).

(22) future(M) & past(M) & present(M)

Applying the (20)-type counterargument to (22) by introducing the temporal locations from which M can be said to be a future, past or present moment again leads to the same kind of inconsistent statement about those locations, and so on; hence an infinite regress.

Implicit in the whole argument (not explicit in Ludlow's exposition of the McTaggart Paradox either) is the assumption that things do not "flip-flop between true and false over time" (p. 151): if E's or M's being a future event/moment is true at some moment, it remains true later, for example. If this assumption were dropped, one could simply say that E was initially a future event, but changed from being a future event to being a present event, and then to being a past event; no relevant conjunction could then be inferred. One may or may not like this "eternal truth" assumption, but let us accept it at least for the sake of argument, since Ludlow's solution to the Paradox (like the one we give in Section 3) is not affected by whether the assumption is rejected.

As seen above, Ludlow advocates that every tensed sentence has an implicit temporal adverbial clause. Let E be the dying of Queen Anne, for example, and assume that we want to say that (i) E was a future event (before it happened) and (ii) E is (now) a past event.
McTaggart’s claimed paradox arises because a simple conjunction of (i) and (ii) is felt to be inconsistent. However, if the idea of implicit temporal clause is adopted, the truth conditions of (i) and (ii) are (23) and (24), respectively.

(23) FUTURE(E) when ...
(24) PAST(E) when ...

The implicit clause in (23) could be something like “Queen Anne was born”; the one in (24) could be something like “I write these words” (p. 134). The conjunction of (23) and (24) does not produce “the illusion of a contradiction” (ibid.), because (23) and (24) have distinct when-clauses.

2.4. First Language Acquisition and Acquired Language Deficits

As seen in the way the A- and the B-theory were introduced in 2.1, natural languages (or at least those which resemble English in the relevant respect) have both A-theory predicates (e.g. past, future) and B-theory predicates (e.g. before, after). The debate between the A-theory semantics and the B-theory semantics can then be seen as a debate over which are more “basic.”

Ludlow reviews psycholinguistic literature on first language acquisition and acquired language deficits, according to which A-theory predicates are acquired before, and lost after, the B-theory predicates. Ludlow takes these findings as indicating that A-theory predicates are more “basic” than B-theory predicates, and hence that the A-theory semantics is supported by psycholinguistics. The idea is that B-theory predicates can best be seen as complex predicates composed of more primitive A-theory predicates.

2.5. Summary

If there are only two possible analyses for something, and one has defects and the other does not, that is a good enough reason for preferring the latter. The existence of positive evidence in favor of the latter strengthens this conclusion. Ludlow argues that this is precisely the case with the B- and the A-theory: (A) is thus established. If this result is combined with (B) (language-metaphysics connection), we reach the conclusion that the B-theory of external reality is wrong.
3. Critical Examinations

Having reviewed the author's general line of argument, I now turn to
critical examinations. In 3.1, I point out that Ludlow's analysis invites
us to ask one conceptual question that Ludlow himself does not raise.
Since an answer is not readily available, in 3.2 I discuss the McTaggart
Paradox in a more general fashion and present an alternative solution,
which gives a clear answer to the question of 3.1. In 3.3 I point out
another advantage of the alternative solution. In 3.4, I argue against
presentism, which is the immediate source of the disadvantage of
Ludlow's solution pointed out in 3.3. However, in 3.5, I point out that
the real source of the defective nature of Ludlow's solution is more
deep-rooted: a failure to distinguish the cognitive agent from the theo-
rist.

3.1. On the Attempted Solution to the McTaggart Paradox

Ludlow's solutions to the alleged defects of the A-theory, the problem
of temporal anaphora and complex tenses and the McTaggart Paradox,
crucially rely on the assumption that every tensed sentence has an
implicit temporal adverbial clause. Note that the adverbial clause is
itself tensed. Does the adverbial clause, then, have an adverbial clause
of its own? If yes, we would be led to an infinite regress; in order to
understand a tensed clause, we would have to reconstruct and under-
stand its accompanying temporal adverbial clause, but the reconstruction
and understanding of the adverbial clause would require the reconstruc-
tion and understanding of its own accompanying adverbial clause, and
so on.

Technically speaking, such an infinite regress does not arise in the
fragment Ludlow gives in Technical Appendix T5. The relevant rules
are given on p. 209:

(25) S → IP when/before/after IP
(26) IP → NP I'
(27) I' → I VP

S (but not IP) introduces a temporal adverbial clause. Another S could
arise within the second IP in (25), if the following rule for clause-
taking verbs is adopted from Technical Appendix T3:

(28) VP → V_{int} S (p. 197)

Indeed, something like (28) should be adopted anyway, but the resulting
prediction would simply be that the kind of infinite regress could arise
only when clause-taking verbs were repeatedly chosen. Ludlow thus could simply say that the sentence would not be understandable in such a case, without undermining his whole argument. Thus everything is all right.

But is it? The whole idea is that a sentence (S in (25)) should be broken down into the claim part (the first IP) and the auxiliary part (the second IP); both semanticists and speakers have failed to notice the existence of the auxiliary part. Conceptually, the claim part can only be understood with respect to the auxiliary part, not vice versa.

Seen in this way, his solution can be broken down into two parts: (i) the explicit claim relies on something implicit, and (ii) the latter should be analyzed as an implicit temporal adverbial clause adjoined to the former (in the LF tree).

One conceptual question about (i) then arises. Why does the claim part have to rely on something implicit? In other words, why are we unable to make a claim linguistically without relying on something we do not explicitly utter? An answer to this question is not readily available within Ludlow's analysis. (Simply stipulating that it is part of the UG architecture would amount to giving up any attempt to answer.) However, there is already an alternative solution available, an alternative that shares (i) with Ludlow's solution but gives a straightforward answer to this question. To illustrate the general idea of the alternative, we first reconsider the McTaggart Paradox in more general terms.

3.2. The McTaggart Paradox Revisited

The gist of the alleged paradox is that the A-theory entails (29), which is inconsistent, where X may be an event or a moment:

$$\text{(29) } \text{FUTURE}(X) \& \text{PRESENT}(X) \& \text{PAST}(X)$$

However, if PAST, PRESENT and FUTURE are parameterized, say by being given a second argument, the result is clearly not inconsistent:

$$\text{(30) } \text{FUTURE}(X,T1) \& \text{PRESENT}(X,T2) \& \text{PAST}(X,T3)$$

The intended interpretation of (30) is that X is a future event/moment if seen from a time point T1, is a present one if seen from T2, and a past one if seen from T3. However, simply giving a second argument sounds like treating FUTURE, PRESENT and PAST as more or less synonymous with LATER-THAN, SIMULTANEOUS-WITH, and EARLIER-THAN, respectively, which are clearly B-theory predicates. Then if one wants to construct a properly non-cheating A-theory solution to the alleged paradox along such a line, one has to come up with a clever
Ludlow parameterizes the predicates with his implicit adverbial clauses. Thus his solution also takes this general line. Is this solution not a kind of cheat? Ludlow would reply negatively, pointing out that *before* and *after* are B-theory predicates but can be defined by the A-theory notions *PAST* and *FUTURE* (p. 126), and *when* and *at the same time* are not synonymous (p. 128). However, I suggest that the crucial feature is the implicit status of the auxiliary part, as opposed to the explicit claim part; if the auxiliary part were always explicit, *PAST* and *FUTURE* would have become B-predicates. This explicit-implicit asymmetry gives an alternative picture, that answers our question above.

What I have in mind as an alternative is based on Nakayama’s (2003) solution to the McTaggart Paradox. He introduces the notion of indexed predicates. According to him, if X is present now, it should be expressed (if put in first-order logic) as something like (31):

\[(31) \text{PRESENT}_0(X)\]

McTaggart would point out that X will become past at a later stage, but, if Nakayama’s idea is accepted, what we will have at that later stage is something like (32):

\[(32) \text{PAST}_1(X)\]

The conjunction of (31) and (32) does not give an inconsistent result; \(\text{PRESENT}_i(X)\) and \(\text{PAST}_j(X)\) give an inconsistent result only if \(i = j\). Where do these indices come from? Nakayama (2003: 96) gives the following correspondences between the unary indexed predicate \(\text{PRESENT}_K\) (E is present) and the binary non-indexed predicate \(\text{PRESENT}\) on an event E and a stage K (E is present at K):8

\[(33) \text{PRESENT}_K(E) \text{ iff } \text{PRESENT}(E,K)\]

\(\text{PAST}\) and \(\text{FUTURE}\) are given similar treatments. Clearly, K is intended to model the temporal vantage point from which E is seen, and the indexed predicate is one that leaves the vantage point implicit.

For Nakayama, the binary predicates in question are A-theory predicates, not B-theory predicates. Simply, this is because B-theory predicates are defined as such predicates as *before*, *after*, etc., whereas A-theory predicates are defined as such predicates as *past*, *present*, etc. But this is not a very interesting reason. A proper reason should ideal-

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8 The term “stage” is my translation of his Japanese term “dankai.”
ly tell us what it is that the B-theory predicates have in common that distinguish them from the A-theory predicates, and vice versa.

I suggest that the common characteristics of the B-theory predicates is that they are inherently binary, while what is shared among those A-theory predicates is that they are principally unary, in the following sense: if BEFORE(E,K), K is expressed as the complement of before, while if PAST(E,K), K can be expressed only as an adjunct (say, at K or if seen from K). Thus A-theory predicates are those which can express the vantage point only as an adjunct, while B-theory predicates are those that express the vantage point as a complement.

This complement/adjunct distinction, I would maintain, reflects the situated nature of cognition. The idea of situated cognition is one of the central ideas of Situation Theory (Barwise (1989)), which Nakayama's idea of indexed predicates naturally leads us to. A-theory predicates allow K to be expressed only as an adjunct because they are predicates that express situated cognition (in the sense explained below), while B-theory predicates express K as a complement because they are non-situated predicates.

More concretely, Barwise (1989) argues for the idea of variable predicate arity. For example, suppose that Holmes, who is on one side of the table, and Watson, who is on the other side of the table, both claim (34).

(34) The salt is left of the pepper. (Barwise (1989: 237))

Let us suppose that Holmes and Watson are talking about the same salt and the same pepper shakers at the same time. In one sense they say the same thing. However, if Holmes is right, then Watson is wrong; if Watson is right, then Holmes is wrong. What is happening here?

Here comes the idea of situated cognition. A cognitive agent can recognize (and hence express) only what is observed in a situation he or she finds himself or herself in. Let us say that Holmes is in situation S1, Watson is in situation S2, and S0 is a larger situation that includes both S1 and S2. The relation “left of” is binary (“A is left of B”) in S1 and S2; it is ternary (“A is left of B if seen from C’s perspective”) in S0. The perspective, the third argument of the relation

9 For those readers not familiar with logic or computer programming, the “arity” of a predicate is the number of the arguments the predicate takes. Thus this expression means the same thing as “valence.”
“left of,” is invisible in the agent’s perspective situation and hence cannot appear as an argument of a relation in that situation. On the other hand, $S_0$ is the perspective situation of the theorist, an outside observer; both Holmes and Watson, the observing agents, and hence their perspectives, are visible to the theorist. Then what is common to Holmes’ and Watson’s claims is that A is left of B, but they disagree about which situation ($S_1$ or $S_2$) “supports” that claim.

A close parallel with Nakayama’s idea of indexed predicates is clear. His indices and Barwise’ perspectives can then be seen as modeling the same things, the agent’s vantage points, in different terminology; Nakayama’s index is invisible to the agent in the way that Barwise’s perspective is. Thus the temporal location of an event or a moment evaluated with respect to the observer’s vantage point is described with an A-theory predicate not taking as an argument the vantage point, which can only be expressed as an adjunct if the observer has “escaped” from his or her own vantage point. (Such an “escape” will be discussed more fully below.) On the other hand, when the temporal location of an event or a moment is evaluated with respect to another, observed temporal location, the observer’s own vantage point can safely be ignored, in which case a B-theory predicate will be used. Put in situation-theoretic terms, let $S_K$ be an agent’s perspective situation, and let $S_0$ be a larger situation that includes $S_K$. Assume one-to-one correspondence between perspective situations such as $S_K$ and agents’ vantage points such as K in (33). Then, E’s being past is a fact in $S_K$, while E’s being before K is a fact in $S_0$.

In this alternative picture, A-theory predicates basically describe the temporal location of an event or a moment from the observer’s own temporal perspective, which itself is invisible to the observer. Why then does an A-theory predicate tolerate the perspective expressed as an adjunct? In other words, what does it mean to “escape” from one’s own perspective situation? To answer, I would like to resort to the Cognitive Grammar idea of “displacement” (Langacker (1985)).

In fact, the whole idea described above has a striking resemblance to Langacker’s (1985) and Honda’s (1994, 2005) idea that, for an observer, his or her vantage point is invisible (unless “displaced”). Put in Honda’s (1994) Gibsonian version, explicit “reference is possible only to the entities in the vista” (p.85; italics by Honda). If we interpret the Gibsonian term “vista” as a consciously recognized “scene,” which may be physical or abstract, extending Honda’s (1994: 77) “visually per-
ceived scene" sense, this claim is almost the same as the idea presented above. In such a theoretical context, Langacker (1985: 127) defines "displacement" as "our ability to describe a situation from a vantage point distinct from our actual one," in terms of which Langacker accounts for, among others, the difference among the three expressions to be used when something done by the speaker himself/herself is described: (a) the zero form, (b) I (first person), and (c) the person uttering this sentence (third person). The speaker is invisible to himself/herself and hence, unless he/she regards himself/herself as the object of observation, (a) will be used; if the speaker displaces himself/herself and regards himself/herself as the object of observation, (b) will be used; if he/she displaces himself/herself further, (c) will be used. This idea, in turn, has a parallel in Situation Theory. If the speaker appears as a constituent not only in the utterance situation (which is not part of what the speaker observes) but also in the described situation (which is part of the observation), either (b) or (c) could be used. The choice depends on whether the utterance event is part of the observation: (b) requires the utterance event to be a fact in the utterance situation (not part of the observation), while (c) requires it to be a fact in the described situation (part of the observation). When the speaker utters a sentence, the utterance situation is his or her vantage point; the utterance event can become the object of observation (part of the described situation) only if the speaker displaces himself/herself and observes his/her own speech event. If Barwise's above idea of variable arity is also employed, (a) will be predicted to be used when the speaker himself/herself appears only in the utterance situation (that is, not in the described situation) as an argument. In addition, Langacker's account of the following pair (adapted from Langacker (1985: 140-141)) straightforwardly carries over to Barwise's framework in question:

(35) a. Look, Chomsky is sitting across the table!
   b. Look, Chomsky is sitting across the table from me!

For an exclamation at the time, I would use (35a), but if we are looking at a picture of the scene, I cannot use (35a); I have to choose (35b). This is because, according to Langacker, I am the vantage point in the former case, but displaced in the latter. In the situation-theoretic picture of Barwise, (35a) describes a fact in my perspective situation (and hence I do not appear in the description), while (35b) describes a fact in a larger situation that includes my perspective situation and hence I do appear in the described situation. Thus Langacker's "dis-
placement” analysis of (a)–(c) squares rather nicely with the situation-theoretic analysis.\textsuperscript{10} (Incidentally Ludlow has nothing to say about the pair (35a–b).)\textsuperscript{11}

My proposal then is that an A-theory predicate allows the temporal vantage point to be expressed as an adjunct when the observer is displaced in Langacker’s sense, and the adjunct status of the temporal vantage point is a reflection of the fact that it has become available as an object of observation only as a result of such a displacement.

If a fragment along this alternative line is to be actually constructed, the only requirement it imposes on syntax is minimal (to be sketched below). The main innovations are in the semantic part. Following Barwise and Perry (1983), we assume the notions of utterance situation and described situation. Following Barwise (1989), we also assume the notion of perspective situation and the idea of variable arity. Further, following Langacker (1985), we assume some mechanism of displacemen-

\textsuperscript{10} In fact, Situation Theory is not as incompatible with Cognitive Grammar as usually assumed (but it deviates more radically from conventional formal semantics than usually thought). For example, in Situation Theory, an agent is assumed to recognize the “uniformities” he or she finds in his/her interaction with external reality, and the objects found in situation theoretic description of the worlds are such agent-relative uniformities. There is a good sense, then, in which the objects in the models in Situation Theory are models of the ways the agents conceive the world, not of the agent-independent world per se; the “uniformities” are given realist, instead of psychological, interpretations, but it is not clear what substance this realist interpretation has. For another example, consider Honda’s notion of “ecological self,” which relies on the fact that the changes in the observed scene tells the agent of his/her own movement. This is very close to, if not identical with, what Barwise and Perry (1983) express as “inverse information.” When it comes to natural language semantics, whether Situation Theory and Cognitive Grammar are incompatible is not clear to me. To say the least, the two need not be sharply distinguished as far as the arguments in this review are concerned.

\textsuperscript{11} The following pair, taken from Honda (2005: 34), receives a similar account:

(i) Kyoto is approaching.
(ii) We are approaching Kyoto.

While on a train headed toward Kyoto, we can utter either (i) or (ii). (I thank an anonymous reviewer for pointing out the need to explain how the present account deals with such a pair.) (i) is a description of a fact in the speaker’s perspective situation, while (ii) is a fact in a larger situation including the speaker’s perspective situation. Note that, in this account, Kyoto’s approaching is a real fact (a perspective-dependent real fact). This means that facts in perspective situations are in general not persistent (that is, may not obtain in larger situations).
The meaning of an expression is then analyzed as a two-place relation between the utterance situation and the described situation, where the utterance situation is the speaker's perspective situation. A-theory predicates are those which lexically require the described facts to be facts in the perspective situation, that is, the utterance situation, while B-theory predicates are those which lexically require a "standard" temporal location argument with respect to which the temporal location of the described event or moment is evaluated. The lexical requirements of A-theory predicates can be relaxed by the mechanism of displacement, which detaches the described fact from the perspective/utterance situation by adding the temporal perspective as an adjunct. The only requirement on syntax is for it to be able to deal with such displacement cases. The underlying general idea is the same as Honda (1994, 2005): you can linguistically express only what you observe, and hence you cannot express your own vantage point from which you observe things.

I want to emphasize that the crucial features of Nakayama's general idea, whether implemented in Situation Theory (as above) or in Cognitive Grammar, are on the one hand the recognition of the perspective-dependent nature of cognition, and on the other the clear separation of the cognitive agent and the theorist. Thus, putting aside whether it should be technically expressed in terms of Situation Theory or Cognitive Grammar, my proposal can be summarized as follows.

(36) A-theory predicates are B-theory predicates minus the vantage point argument slot, employed by a (non-displaced) sit-

12 Speaking precisely, in the situation-theoretic analysis presented in this review, the difference among the zero form, I, and the person uttering this sentence on the one hand, and (i)-(ii) in the previous footnote, are explained with no new theoretical mechanism, while the vantage point adjunct for an A-theory predicate is assumed to require some theoretical mechanism of displacement. I do not know at present whether this asymmetry means that Langacker's idea of displacement should be seen as an observational generalization of various non-homogeneous phenomena or that the present analysis needs technical refinements. For concreteness, in this review I accept the asymmetry and assume that some displacement mechanism exists in the grammar for the vantage point adjunct cases.

13 One possible way to deal with displacement cases is to have a displacement lexical or constructional rule, but I have not examined the possibilities of other ways.

14 I thank an anonymous reviewer for pointing out the need for this paragraph.
uated agent; the argument slot is available only when the agent displaces himself or herself; in the B-theory versions, the vantage point argument is (not the observer’s own but) the observed vantage point.

The cognitive agent can see things only from his or her perspective (or vantage point), while the theorist’s description of things is, by assumption, perspective-independent. A-theory descriptions of time (without a perspective adjunct) would then be the (non-displaced) agent’s descriptions, while B-theory descriptions would be the theorist’s descriptions, which an agent can use when he or she puts himself or herself in a position of a theorist for whom his or her own temporal vantage point can safely be ignored. The solution this alternative provides to the McTaggart Paradox is essentially the same as Nakayama’s solution: in this alternative analysis, the conjunction of PAST(X) and FUTURE(X), both situated claims, is inconsistent only in the same sense in which the conjunction of Holmes’ and Watson’s situated claims is.

Note that this alternative picture of the A- and the B-conceptions of time, while agreeing with Ludlow that our explicit claim relies on something implicit, gives a straightforward answer to our question of why we need to rely on something implicit. It is simply because the “something implicit” is the vantage point; and it is implicit because the vantage point is invisible (except in the case of displacement).

Also note that this alternative, while sharing with Ludlow the reliance on something implicit, differs markedly about what the implicit part should be analyzed as. A Ludlow-style implicit adverbial clause introduced by when attached to a past-tense sentence, for example, cannot be taken as (an external description of) the speaker’s vantage point, given that the when expresses something simultaneous with the main-clause event (thus the adverbial clause is required to have the PAST operator, in agreement with the past tense of the main clause). In as much as our alternative picture of the A- and the B-conceptions of time is on the right track, Ludlow is correct in assuming the reliance on something implicit but is wrong about what that thing is.

Thus far, we have seen that our alternative readily answers the conceptual question on which Ludlow remains silent. It should also be noted that our alternative squares nicely with the observations Ludluw adduces that A-theory predicates are psycholinguistically more basic than B-theory predicates: perspective-dependent descriptions are more basic than perspective-independent descriptions. In the next subsection
I give another reason to prefer our alternative over Ludlow's.

3.3. The Agent-Theorist Distinction and Indexicality

Ludlow, like most other ordinary language philosophers, such as Smith (1993), does not distinguish between cognitive agent and theorist. This is most clearly seen in Ludlow's critique of the idea that A-theory tense is a matter of belief (or psychology) and hence semantics and metaphysics can be constructed on B-theory (pp. 95–96). His reasoning is that if "the world contains only B-theory resources" then we would be unable to have "a B-theory psychology" (p. 96). However, this reasoning is clearly invalid. If seen in the schema (1), and if the cognitive agent and the theorist are clearly separated, there is no inconsistency in saying that what appears in a B-theory manner to the theorist appears in an A-theory manner to the agent. To his question "Why do we call consciousness or perception tensed if it does not correspond to something tensed in the actual world?" (p. 96; italics by Ludlow), we can simply answer by saying "Because our experiences are tensed to us."

Also, once the agent and the theorist are separated, we notice that not only the events and states that give rise to the agent's beliefs about them but also the agent's (situated) cognitive activities are real eventualities in the world.

With this in mind, let us return to the issue of the indexical nature of temporal expressions. Consider (8)–(9), repeated here as (37)–(38) with the relevant parts in italics:

(37) My fifth anniversary is March 12.
(38) My fifth anniversary is today!

Clearly, they are not synonymous. However, such a contrast is not limited to temporal expressions. For example, (39)–(40) show the indexical nature of spatial expressions; for those speakers and hearers who do not realize that the room they are in is Room 101, they are very different.

(39) Smoking is prohibited in Room 101.
(40) Smoking is prohibited here/in this room.

What is common to the two cases is that the agent lacks the information that links his/her own location identified in an indexical way to something conceived in a non-indexical way. A solution to the indexicality problem of (37)–(38) that misses this obvious commonality is clearly unattractive.
Our alternative construal of the A- and the B-conceptions of time, coupled with the clear separation of the cognitive agent and the theorist, readily accounts for both in a uniform manner. The relevant expressions in (37) and (39) are both (quasi-)B-type expressions, not dependent on the vantage point. (They do not have corresponding (quasi-)A-type versions.) In contrast, those in (38) and (40) are both (quasi-)A-type expressions, understood only from a particular implicit vantage point. It is just that the agent has failed to properly relate his/her implicit vantage point with a date/place grasped in a perspective-independent, B-theory manner.

In contrast, an attempt to capture the commonality within Ludlow's theory would lead to a disastrous consequence. Remember that part of his theory is presentism, the claim that only the present is real. In the case of time, A-theory metaphysics in the sense of presentism would not be a major problem, given that we all share the same present (singular, common external world), putting aside how we should conceive Einsteinian Relativity. However, if the spirit of the A-theory (in the sense of presentism) is applied to space, for example, we would immediately be in trouble, as Ludlow himself is aware (n. 1 to p. 147, to be found on pp. 227–228); an A-theory of space would lead to solipsism, since "we do not share the same spatial position" (p. 228), and since presentism, as extended to cover both time and space, is the claim that only what is observed (now and here) exists. In other words, unless one is ready to accept solipsism, Ludlow is destined to fail to capture the commonality.

Thus, our alternative is superior also in its uniform treatment of temporal and spatial indexicality.

3.4. Presentism

If the immediate source of Ludlow's difficulty in capturing the commonality between temporal and spatial indexicality seems to be the assumption of presentism, then why not abandon presentism? Or, can it be abandoned?

In this subsection, I first examine Ludlow's two reasons for assuming presentism. We will see that neither of them is compelling. I will add, then, another argument against presentism.

Ludlow's first reason for assuming presentism is that researchers of what might be called "past events" do not attempt to invent a time machine and travel to the past, but rather search for "records" (p. 99) in
the present; they are dealing with the present, not the past. On the other hand, his second reason is that an anti-presentist view would cause an epistemological problem: if some of our sentences refer to past events, how could we have access to such remote things?

Both of these reasons are dubious. Let us examine both in turn.

First, it is true that biologists dealing with dinosaurs or historians of the Renaissance, say, do not travel to the past to evaluate the truth or falsity of their colleagues' claims, but this is not because they do not have to; rather, they wish they could but they simply cannot. Instead, they evaluate those claims as scientific hypotheses, using present records as data. This is exactly the same with physicists dealing with the sun, for example. You cannot travel to the sun, jump in and find out what chemical reactions are taking place there; you have to evaluate the available hypotheses, using what you observe where you are (typically, on earth) as data. Thus denying the existence of the past is like denying the existence of the sun. Psychologists and semanticists can talk about the gaps between what the agent thinks the world is like on the one hand and objective reality on the other, on the assumption that the latter is such and such, but biologists, historians, and physicists are struggling to find out the "such and such." They can only submit hypotheses; only God can arrive at the absolute truth.

Ludlow's second reason for assuming presentism is closely related to the first. For example, suppose I experienced two personal events last year, E₁ and E₂. Assume that E₁ occurred before E₂, but that I lack any records and I now believe in the opposite order, owing to my hazy memory. Nobody else was sufficiently interested in my life history to remember the order or note the events. Thus, no one can correctly determine the truth value of something like (41).

(41) E₁ occurred before E₂.

Nobody has epistemological access to the two past events or the correct truth value of (41). Is this a problem?

It could be a problem only if we assume that English speakers should be able to determine the truth value of (41). But what is the reason for assuming that ordinary speakers have stronger epistemological power than scientists? Nothing, at least as far as the arguments presented by Ludlow are concerned. The conventional dogma of truth conditional semantics is only that speakers should be able to decide the truth value of a sentence or an utterance given that he/she knows that the external
reality is such and such.\footnote{A similar argument can be found in Bonomi (2002), to which an anonymous reviewer has drawn my attention.}

Our arguments above are rather "negative" arguments against presentism: the reasons given for assuming it are invalid. However, we can also give a somewhat more positive argument against it: if presentism were assumed, we would be in trouble (or at least no better off).

Remember that we clearly separated the theorist and the cognitive agent. Given that we are theorists studying the behavior, knowledge, etc. of the latter, this separation is usual scientific practice. We also noted that, once the two are separated, the cognitive activities, in addition to their conceptions of the events and states they talk about, become the objects of our study. To say the least, cognitive activities are real events in the world.

Neuroscientists and experimental psychologists have obtained massive evidence that cognition takes place in time, in the sense that the time courses of neuronal and physiological activities are crucial for cognition.\footnote{For pointers to the relevant literature, see Evans (2004). Evans has even argued that our conception of time has its origin in such physiological facts.} For example, when we perceive an object, such pieces of information as its color or its shape are known to be processed by spatially dislocated neurons. In order to perceive the object, these pieces of information have to be combined somehow. The identification of the manner in which these pieces of information are combined is known as the binding problem in the neuroscience literature. The synchronous firing hypothesis claims that those distinct pieces of information coming from a single object can be combined because the distinct sets of neurons processing them fire synchronously. If so, even the perception of a stationary object, a real event in the world, requires the passage of time.\footnote{Again, see Evans (2004) for references.}

Also consider, say, sound perception. I might claim (42).

(42) There is a sound over there.

You have to hear at least two cycles to accept or reject (42); an instant of length 0.0ms is clearly not enough. With linguistic sounds containing consonants, things become even more complicated. What would it mean to say that you hear a slow utterance of the word put, for exam-
ple? The perception, and hence the existence, of stop consonants such as [p] and [t] crucially rely on the burst and the formant transitions of the neighboring vowels, both of which are crucially dependent on the time course of the events, not a single “present” instant. Similarly, what would it mean to admit the existence of the waltz rhythm? How about various flamenco rhythm patterns? Are we not talking about patterns in time, rather than a single present moment? Crucially, these (abstract) objects exist only as a result of our recognition of them in time.\textsuperscript{19}

Note again that our cognitive activities are real events in the world. Unless some technical translation of these observations is maneuvered, we have to admit the passage of time even for our recognition of a stationary object. Even if some technical translation to presentism were possible, what advantage would it bring us? I see none.

3.5. The Claimed Thought-Metaphysics Connection

Can Ludlow accept the arguments in 3.4 and reject presentism, so as to capture the commonality between the indexical nature of temporal and spatial expression? Unfortunately, the answer is no.

In fact, the defect of Ludlow’s theory seen in 3.3 is not specific to presentism but rather stems from his assumption of the linkage between language/thought and metaphysics. First-hand thoughts are always perspective-dependent, and A-type spatial descriptions by different agents are usually incompatible with each other. If these descriptions are equally valid metaphysically, we would have to say that different spatial perspectives give rise to different worlds. If understood as an ontological claim, this would amount to the claim of the existence of multiple worlds, not something many people are happy with. More importantly, such a claim is very hard to distinguish from the claim that we live in one and the same single world, which can be described from different perspectives; then the claimed linkage to metaphysics would lose its substance.

Also note that the arguments in 3.4 are based on the clear separation of the agent and the theorist. As far as Ludlow insists that agents

\textsuperscript{18} A flamenco rhythm pattern cannot be identified until several bars have been heard.

\textsuperscript{19} A similar argument can be found in Bonomi (2002: 91–92).
should be able to correctly decide the truth values of sentences or utterances available to the theorist (again, the linkage assumption), he cannot adopt our arguments.

Thus, the real source of Ludlow's difficulty is his insistence on the thought-metaphysics connection. Why, then, does he insist on it?

The idea of the language-thought (or, equally, meaning-cognition) connection is not news. On the other hand, the idea of language-metaphysics connection has been a traditional dogma of analytic philosophy. Thus the disagreement has been whether language should be conceived as connected to thought/cognition or metaphysics/reality; the existence of gaps between thought/cognition and metaphysics/reality were presupposed. Why?

Of course, perception studies have told us for centuries that the stimulus we receive from the external world underdetermines our perception; our brain has to supply some additional information in order to perceive something.\(^{20}\) However, gaps between cognition and external reality are manifest not only in perception but also in language. One does not have to go beyond an introduction to semantics to appreciate this. For example, the issue of indexicality seen in 3.3 is in fact an instance of a more general issue, which I would call the identity recognition problem. For example, consider the famous Fregean identity statements:

\[\text{(43) The Morning Star is the Evening Star.}\]
\[\text{(44) The Morning Star is the Morning Star.}\]

This time, the relevant expressions (again, italicized) are both non-indexical and of B-type. However, for a cognitive agent who has failed to properly relate what he or she knows as the Morning Star and what he or she knows as the Evening Star, (43) and (44) express different claims. Information available to the theorist is not always available to the cognitive agent. In other words, an agent's cognition and the theorist's metaphysics do not always converge. We are liable to make mistakes. It is an old fact of life.

Of course, Ludlow, a formal semanticist, is well aware of such Fregean identity statements, and is ready to provide an analysis in terms

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\(^{20}\) An image of a static object on the retina is two-dimensional and hence underdetermines the perceived distance from, and the three-dimensional shape of, that object. For how auditory stimulus underdetermines auditory perception, see e.g. Bregman (1990).
of Interpreted Logical Forms (Ch. 3). However, the Fregean identity puzzle and the indexicality problem in question seem to share the same logical structure. Both arise ultimately from the limits to human cognitive ability. If the agent and the theorist are not clearly distinguished, it is often easy to fail to appreciate the fact that human cognitive ability is limited, as in Ludlow's argument. Human understanding of language meaning underdetermines its metaphysical interpretation.\textsuperscript{21}

4. Conclusion

Ludlow's analysis and our alternative partition the problems in different ways. In the former, the issue of temporal indexicality on the one hand and the issue(s) of temporal anaphora and complex tense on the other are treated by the same mechanism (implicit adverbial clauses), that cannot be readily extended to spatial indexicality or what I called the identity recognition problem. In contrast, in the latter, the issues of temporal and spatial indexicality are regarded as subspecies of the identity recognition problem, while the issue(s) of temporal anaphora and complex tense should receive a distinct account. I cannot discuss here their respective (dis)advantages in terms of their (possible) treatments of temporal anaphora and complex tense. Let me make just one remark: our alternative is compatible with both the E-type implicit clause solution and the "direct reference" solution, the latter of which Ludlow dismisses primarily as a result of his assumption of presentism.

It is not news that human thought and objective metaphysics diverge. One disagreement in semantics has hence been over which should be seen as the semantic object to which natural language expressions should be linked. If Ludlow is right, such a disagreement is just pointless; either should bring the same result. My verdict is that things are not that easy, but the radical claim of the book under review will definitely force the reader to tackle the old and familiar thorny issue: is meaning metaphysical, mental, or both?

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