"Time Is Money"

—

The Anatomy of a Metaphor

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ABSTRACT

Lakoff and Johnson (1980) propose metaphor themes like TIME IS MONEY as 'gestalts' needed to account for much semantic and lexical regularity in English. In an extensive test of this notion, the semantics of the **Commercial Transaction Frame** (based on Fillmore 1977) is developed in detail, giving the minimal context for definition of *money*. The frame and its **Local Cases** are used to give a consistent semantics for a number of lexical items, including *buy*, *sell*, *pay*, *spend*, *value*, *worth*, *cost*, and *price*, and an empirical mapping is then constructed to demonstrate how this frame is transformed metaphorically to one which underlies the semantics of perceived duration in English. The conclusions drawn are that Lakoff and Johnson are essentially correct, and that metaphor themes are both empirically valid and semantically valuable.

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I. Introduction

This study began as a result of my asking myself a simple and in fact unavoidable question. The question arose in my efforts to work out in some detail the metaphor theme TIME IS MONEY proposed by Lakoff and Johnson (1980) as a coherence device for temporal reference in English.

Briefly put, they claim (and present much evidence for the claim) that a great deal of the reference to time in English is controlled by this metaphor; that collocations such as *spend time, waste time, budget time*, and *worth one's while* are instances of the use of lexical items properly defined only in terms of MONEY as if they were properly definable also in terms of TIME.

This, they say, is a typical metaphoric use, in that while time is mysterious, money is something everybody has experience with, and this therefore allows us to communicate about time in terms of common biography. Plausible enough, but their statement (and the examples they offer) cannot substitute for a more explicit portrayal of the semantic relationships that they claim obtain. As I pointed out in Lawler (1983:202, note 3), "This book [L&J 1980] **presupposes** its lexical semantics and grammatical theory." This situation is not acceptable forever, and a much more detailed account is clearly necessary; hence my concern with this one metaphor theme as a starting point.

If we use MONEY terms to refer to TIME concepts — or, indeed, to **create** TIME concepts, as L&J suggest — then it becomes imperative to be able both to distinguish the two and to discuss the appropriate definitions of the MONEY terms. This is where the question arose: What, I asked myself, does the word *money* mean? An answer to this question would contribute to a more satisfactory analysis not only of the TIME IS MONEY theme, but also to many others, since concepts from this conceptual field occur frequently elsewhere.

There are, of course, academic disciplines, such as economics, which deal in answers to this and related questions. My impression, however, is that the basic concepts of these fields and their associated vocabularies are quite technical, deriving like all technical sublanguages from shared perceptions and distinctions that are neither available nor particularly relevant to most speakers of English.

No matter how accurate and scientific the foundations of these technical disciplines might be, they cannot provide a real grounding for an account of an actual human language. In English, we speak of the sun *rising*, even though we all know that the phenomenon is due to the earth's diurnal rotation; we treat the noun *sky* as referring to a flat colored physical object, even though we know about the optical scattering effect of the atmosphere.

If widespread and longstanding knowledge of the basics of the physical sciences has had this little effect on the ordinary use of English, it is doubtful that the social sciences will fare better. Thus, the technical meanings of *money* and its lexical kin are not the place to start; whatever economic theories lurk in the ordinary meanings of these words are folk theories, not scientific ones. Nor will I be concerned here with pursuing questions of the meaning and status of these terms as part of any technical sublanguage; this must be a question about the English language. To repeat it, what does *money* mean?

The answer that I propose here to this question makes use of a species of the concept **Frame** that has been widely used in the cognitive sciences. Bateson (1955) generally gets credit for introducing the term in something like the modern sense; this was extended in several ways by Goffman (1974), and has become part of the general repertoire of cultural analysis. Schank (1973, 1975) uses the term **Conceptualization** for something very similar, though in a radically different context.

The frames I describe here may be thought of temporarily as semantic representations of parts of Goffman's sociological frames. The controlling image is that of a frame in a movie film, a static picture of an event, preceded and followed by other static pictures, with the observer supplying a continuous interpretation by means of frame transitions. This image will not do us forever, and I hope to flesh it out to a considerable extent in this study, which is derived from ideas in two informally circulated notes (Lawler 1980, 1981). In particular, the "static picture" trope will not survive metaphorization, for reasons that will be discussed in Section V.

In terms of cognition, the frame is a cultural prototype, a classification of observed reality into recognizable events. It is in terms of these frames, I claim, that many if not most lexical items may find their proper definitions, and in order to define *money* and the other terms defined in turn with respect to it, I found I had to describe a **Commercial Transaction Frame** (henceforth **CTF**).

My description of this frame owes much to the work of Charles J. Fillmore, who first described the Commercial Event as a semantic entity in Fillmore (1977). While our purposes differ, and our terminologies are not the same (for instance, he uses the term **Scene** instead of **Frame**), I intend this study to be the "really careful analysis" he calls for there (p. 72, note 1). The notion of "Local Case" I use below is an logical extension of the motto he gives: "MEANINGS ARE RELATIVIZED TO SCENES" (pp. 59, 72).

The descriptive problem is to find the minimal frame with respect to which *money* can be defined as a semantic prime, and to represent it in as explicit a way as possible, so as to be able to use its parts and relations between its parts in defining other terms which are cited as instantiating the TIME IS MONEY theme; the claim that the theme is a good explanation for lexical selection can then be tested empirically by seeing how much it predicts, based on a formalizable semantic analysis of the conceptual field that serves as the vehicle for the metaphor.

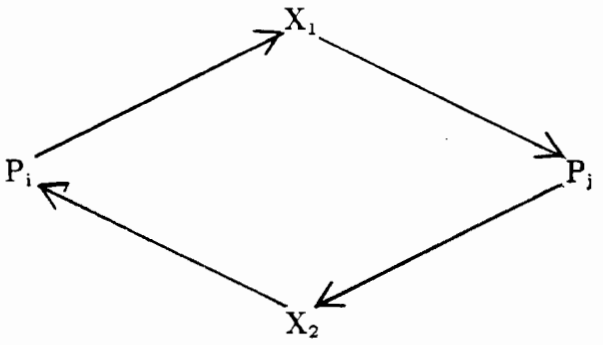
We will proceed here by first examining the logical and semantic underpinnings of commercial transactions in the forms of the Transfer and the Barter frames in Section II, then developing the Commercial Transaction Frame (CTF) itself in Section III. In Section IV, this analysis is used to examine the meanings of four problematic lexical items within this semantic field: *value, worth, cost*, and *price*. The TIME IS MONEY metaphor theme is analyzed in Section V as a mapping of the CTF, generating a systematically modified frame, and finally in Section VI we discuss some implications of this analysis.

Various forms of representation are used for the frames and other conceptual entities. Since I incline to the view that there is and can be no such thing as a perfect set of notational conventions, I will feel free to employ whatever means (graphic presentation, logical formulae, linguistic examples, even an occasional Lisp statement) seem appropriate to present the topics discussed here. I am aiming at clarity and precision of exposition here, for the most part, rather than either rigorous formalization or a practical computational implementation, though there is in principle no reason why either or both of those goals cannot be pursued along the same lines. Indeed, there already exist practical script-driven inferencing systems that implement similar strategies for at least part of this frame, though there is to my knowledge no program that instantiates the entire system as I will develop it here.

II. The Commercial Transaction Frame : Preliminaries

We begin with a simplified description of reciprocal exchange of goods (1):

(1)



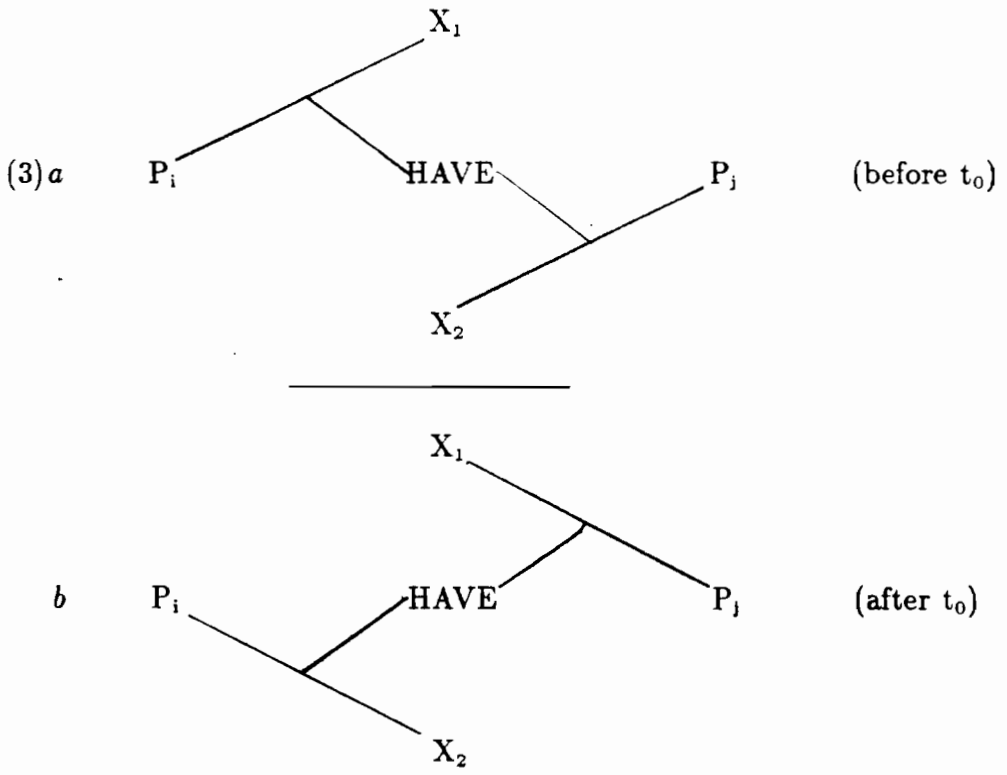
(1) is a graphic representation of the **Barter, Trade**, or **Exchange** frame. In it, $\mathbf{P_i}$ and $\mathbf{P_j}$ represent two personal roles, while $\mathbf{X_1}$ and $\mathbf{X_2}$ represent two commodities (things) that are exchanged. Since the frame is symmetrical, we can assume without loss of generality that $\mathbf{X_1}$ initially belongs (alienably) to $\mathbf{P_i}$ and that $\mathbf{X_2}$ belongs alienably to $\mathbf{P_j}$. Note that (1) is composed of two **Transfer** frames operating simultaneously:

(2)*a* $\mathbf{P_i} \longrightarrow \mathbf{X_1} \longrightarrow \mathbf{P_j}$

b $\mathbf{P_j} \longrightarrow \mathbf{X_2} \longrightarrow \mathbf{P_i}$

In each of (2)*a-b*, one of the commodities is shown as passing from the possession of its original possessor into the possession of the other participant, a concept derived from a physical transfer (Schank's (1973) PTRANS predicate), generalized here into a transfer of conventional Possession (Schank's ATRANS predicate); as we will see in Section V, this can be further generalized into a very abstract notion of transfer in phrases like *give me an idea* or *give me a few minutes* (Schank's MTRANS predicate, in part). We treat these notions here as metaphorically extended versions of the same concept, rather than as separate basic semantic entities. The transfer of conventional possession in (1) and (2) can be represented formally by invoking a virtual instant t_0 at which the transfer is conventionally assumed to occur; that is, **before** t_0, P_i possesses X_1, **after** t_0, P_j possesses X_1. If we define the same instant as being the time at which (2)*b* takes place as well, we have (1) as the combined frame. Note that this transition (and hence the combined frame which includes it) is **discontinuous**; we will return to this concept in Section V.

This discontinuous frame transition can be represented by a sequence of the two frames (3)*a-b*:



We are now nearing a static representation of an event of trade or barter; the links between the respective participants and the things they possess before and after the virtual instant of exchange can be identified by the link label HAVE, representing the logical predicate instantiated in English by the verb *have*, as well as other lexical items. But another set of links is present as well, and this set is important in the recognition of the frame as being a single event, rather than just a simultaneous instantiation of two transfer frames. These links are the ones between the participants in (3)*a* and the commodities they do **not** possess. In order for an event of reciprocal exchange to qualify as *trade* or *barter*, it is necessary that each participant **want** the respective goods of the other, and that they intend to obtain possession of them by means of the exchange symbolized by the transition between (3)*a* and (3) *b*.

This is a more complex concept than it might appear, since it is also the case that the participants are assumed to *want* what they already have, though to a lesser degree if they are willing to trade them away. We may symbolize this situation by reference to a three-place WANT predicate: WANT (P, X, d), where the *P*-argument is a person, the *X*-argument is a thing, and the *d*-argument is the degree (in arbitrary units) to which P WANTs X. This *d* might be implemented as a fuzzy logic truth-variable, as a strength variable on the desire of the P-argument, or as an argument of a DEGREE predicate taking the WANT-proposition as its other argument, etc. The precise details are irrelevant.

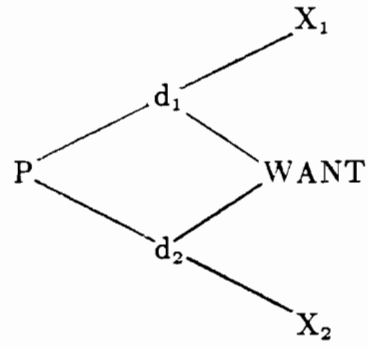
This also raises the issue of the identity of the *X* elements; we have been calling them "commodities", assuming that they are inanimate things alienably possessed by the respective participants. Of course, this is too simple. Animals may be traded, for instance, and even people; while slavery is morally reprehensible, it is not quite ungrammatical yet. Nevertheless, any animate commodity is clearly treated as inanimate in a transaction, at least by comparison with the Human characteristics of the Participants; thus we may pass over this detail without loss of generality.

Not so, however, with another issue: in calling these commodities *things*, we have inadvertently limited them to what Noun Phrases can refer to. However, it is immediately obvious that many transactions involve at least one commodity instantiated in the form of a predicate or Verb Phrase. One can trade one's performance of some action for something else, and one can offer permission to perform an action or experience some event or state in a trade. It is questionable whether the prototype Barter transaction should be limited to one or the other type of generalized commodity; probably this is a matter best left open here. For simplicity and convenience of explication, we will continue in this section and the next to use *X*'s to symbolize the commodities in a trade, and to refer to a commodity as a THING, but this should be understood as referring equally validly to services, permissions, etc.

Happily, this has little or no effect on the rest of the frame, though it becomes quite important in discussing metaphorical extension of the frame. Strictly speaking, one does not actually *want* a thing itself in any case, but rather *wants to have* it, as McCawley (1977) demonstrates; thus even in the case of a Noun Phrase *X*, the WANT predicate should really be WANT (P, HAVE (P, X), d), with a complement predicate under WANT. We will continue to abbreviate this case as WANT (P, X, d) for convenience; with a predicate *X*, the complement HAVE in the full formula may simply be replaced, mutatis mutandis.

The only other necessary condition on WANT is that it be possible for a participant in (3)*a* to assess his desire for one commodity relative to his desire for the other. This requires at minimum a partial ordering relation defined between the two *d*-arguments in (4):

(4)



$(d_1 > d_2)$

If d_1 is greater than d_2, then the participant P would be willing to trade X_2 for X_1; if it is less than d_2, he would not; and if they are equal (or if he cannot decide on the comparative *d*-values) then he would have to depend on other factors besides his desires to determine his actions. Let it suffice us here to note that the condition $d_1 > d_2$ is a necessary one for the consummation of a prototype event of trade.

In addition, we must note that there is a (cancellable) presumption associated with *want* to the effect that if one possesses something, one *wants* (or *wants to have*) it. This in effect licenses a broader interpretation of the English verb *want*. Ordinarily, *want* (a verb closely related to *will*, a point we will return to in Section V) is used to refer to desire for possession (or some other action or state) in the wanter's future or imagination, rather than in present reality. Thus (5) refers to a perfective state of desire, and not explicitly to a current one:

(5) I wanted it, and I got it.

From this evidence, we might conclude that one does not *want* things one already has. However, in situations where the possessor wants **not** to have something, (6) is a common locution:

(6) I don't want this (any more).

This is a linguistically interesting phenomenon. One might set about explaining it syntactically by noting that:

(a) *want* may take an infinitive complement or an NP direct object;

(b) when there is no overt infinitive complement, *want NP* is equivalent to *want to have NP*;

(c) *want* is a verb that governs Negative-Transportation; (R. Lakoff 1969, Horn 1975)

(d) (6) is accurately paraphrased by (6′): *I want not to have this (any more).*

From these points it would be easy to construct an argument to the effect that this use of *want* is merely another case of Negative-Transportation. Whether this is the case or not is actually irrelevant to this analysis; the important point here is that the speaker of (6), whatever syntax be involved, is clearly announcing a value of zero for the degree variable *d* in the formula WANT (I, HAVE(I, this), d).

Perhaps the use of the lexical item *want* in both (5) and (6) is governed by a lexical constraint requiring that there be a **difference** between the actual state of affairs and the desired one. This will ordinarily govern future or irrealis reference in the complement of WANT, and is applicable in both cases — straightforwardly as a future in (5), and irrealis because of the negative in (6) and (6′). In any event, there must be two things to compare in order to have a comparison of any sort, and the *d*-values postulated here will serve this purpose well enough. As we will see in Section IV, there are other reasons to have them, as well.

The frame we have been developing can be summarized in terms of formal meaning postulates:

(7)*a* **(AND**
(PERSON P_i)
(PERSON P_j)) [P_i and P_j are persons]

b **(AND**
(THING X_1)
(THING X_2)) [X_1 and X_2 are *things*, (as qualified above)]

c **(AND**
(WANT P_i X_1 d_1)
(WANT P_i X_2 d_2)
(> d_2 d_1)) [P_i wants X_2 more than X_1]

d **(AND**
(WANT P_j X_1 d_1)
(WANT P_j X_2 d_2)
(< d_2 d_1)) [P_j wants X_1 more than X_2]

e **(FOR-SOME t_{-1}**
(FOR-EVERY t_i
(AND
(PRIOR-TO t_{-1} t_i)
(PRIOR-TO t_i t_0)
(AT t_i
(AND
(HAVE P_i X_1)
(HAVE P_j X_2))))))
[Before t_0, P_i possesses X_1, and P_j X_2]

This is beginning to get complicated. For this reason, it is usually simpler to use either a graphic model for explication or a computer implementation, as I have indicated here by framing these postulates in Lisp. Some of these conditions will have been inherited from the Transfer frame, which we do not discuss here in any detail; a computational account of the frames could capture this fact very easily.

We will adopt several simplifying assumptions:

a) since we are confining attention to the prototype, we will assume a positive value for all degree arguments in (7).

b) we will symbolize only the WANT-predication with the higher value in the comparisons of (7)*c-d*.

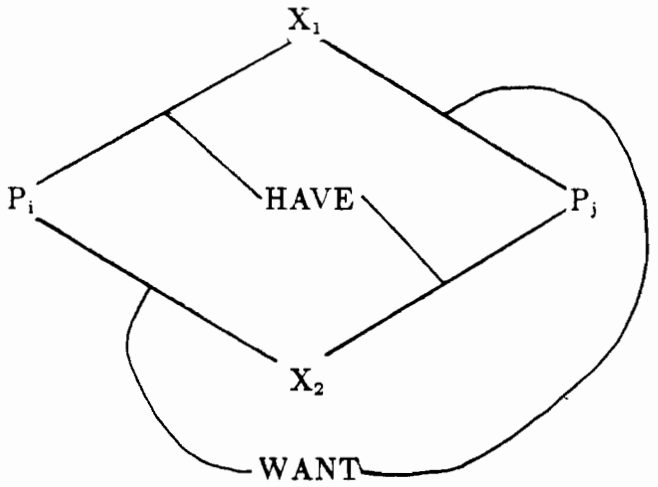
c) we will continue to ignore for the moment those cases in which performance of or permission to perform an action is transferred in trade, instead of physical objects; i.e, we will concentrate on Noun Phrases as X elements instead of Verb Phrases.

d) we will consider all possession alienable — another way of looking at this assumption is to restrict our attention and our representation only to alienable possession, for which the Transfer frame of (2) is probably the defining context, anyway.

e) we will not deal here with the essentially social details of how the participants come to be engaged in an exchange situation, nor with the presumption, actualized in the exchange itself, that the *d*-value of a commodity to one participant is effectively equivalent to the *d*-value to the other participant of the other commodity.

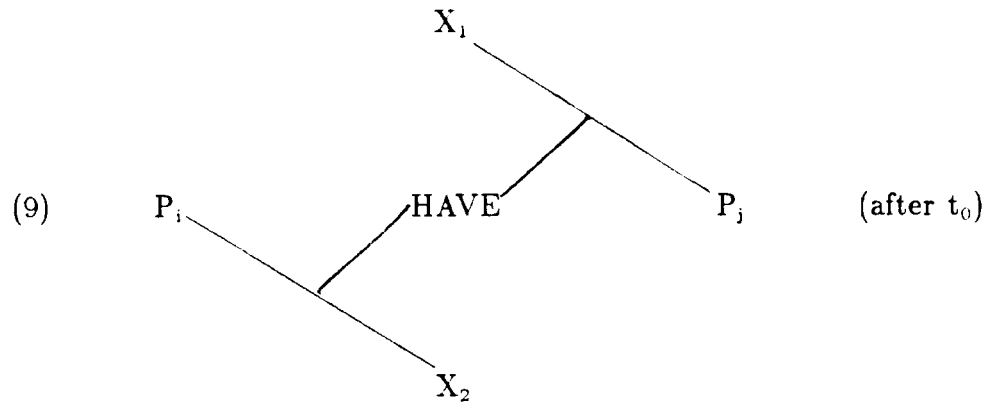
With these caveats in mind, we can symbolize the Barter frame as in (8):

(8)



(before t_0)

and note that its prototype transition is to (9):



In this transition, where there were WANT-links in (8), there are now HAVE-links in (9), and that where there were HAVE-links in (8), there are none in (9). The transition from one frame to the next occurs at t_0; this means that the new possessors enter possession simultaneously. Since ownership is not a concrete concept, the fact that it cannot be ascertained precisely when it changes in absolute terms is irrelevant; what **is** relevant is that it is conceived to change at the **same** instant in the two transfers symbolized in (8)-(9).

We may view this transition in terms of the "sponsor" and "erase" relations used by Postal and Johnson (1980) in presenting Arc Pair Grammar mathematically. The WANT-links in (8) can be said to **Sponsor** the HAVE-links in (9), while the actuation of the new HAVE-links in (9) can be said to **Erase** the HAVE-links in (8). This is to say that not only do the participants in (9) possess the commodity they have traded for, but they also do **not** possess any more the commodity they have traded away.

This appears to come from a cancellable assumption that possession of a thing is a relation that can prototypically be borne by only one individual at a time. Transfer of possession to another individual is assumed to vitiate prior possession relations borne by the first individual. This fact becomes important in discussing deviations from the simultaneity constraint, such as situations in which one participant comes into possession of a commodity through trade before the time at which the other participant comes into possession of the other commodity. It is easy to see how these temporal relations can be exploited to define a notion of Credit, though that is not the point of this paper.

Upon inspection, the Barter frame in (8)-(9) proves to be too symmetric for use as a defining frame for *money*. Neither Participant in a trade such as this can be said, for instance, to be *buying* or *selling*, and neither Commodity can fairly be said to be *money*. While there are lexical items defined with respect to this frame, there are not too many: *trade, barter, exchange* are examples, and, as we will see in Section IV, so are *worth* and *value*. There are also some words like *give, get, receive, donate*, and *transfer*, which are defined with respect to the more general Transfer frame, and the component relations *want* and *have* that we have already considered. In order to find out what *money* means, and to be able to discuss the metaphor TIME IS MONEY, it would seem we need some complications.

III. The Commercial Transaction Frame : *buy, sell,* and *pay*

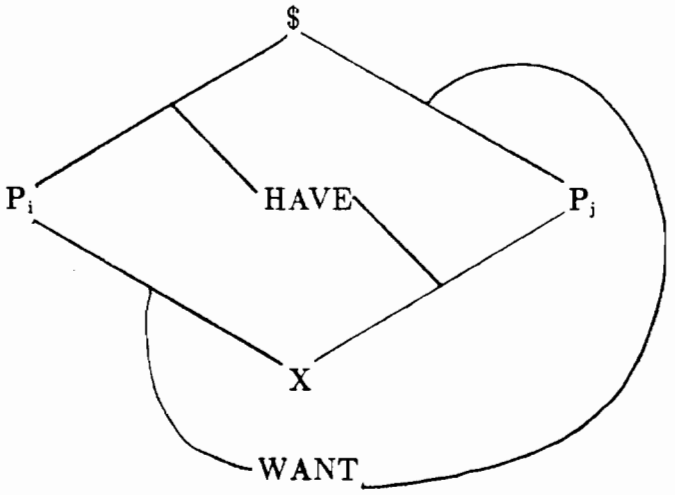
We have now seen two frames of progressively increasing complexity: the Transfer frame and the Barter frame. Neither is the one we need, but both are necessary precursors. We can now specify the precise degree of asymmetry necessary in the frame in order to account for the asymmetry of (for instance) *buy* and *sell.* As Bateson (1972, 1979) has pointed out in several contexts, asymmetry is information; by introducing even one asymmetry into the frame, we greatly increase its information content, and thereby the number of lexical items capable of distinct definitions with respect to it.

The particular asymmetry-producing complication which we will add to the Barter frame to convert it into the CTF is the designation of one of the commodities (arbitrarily, X_1) as a special type of commodity. If one but not the other commodity has a special characteristic, it becomes possible to speak differently about the types of relation between this commodity and any other node in the frame; thus the distinction propagates throughout the entire system.

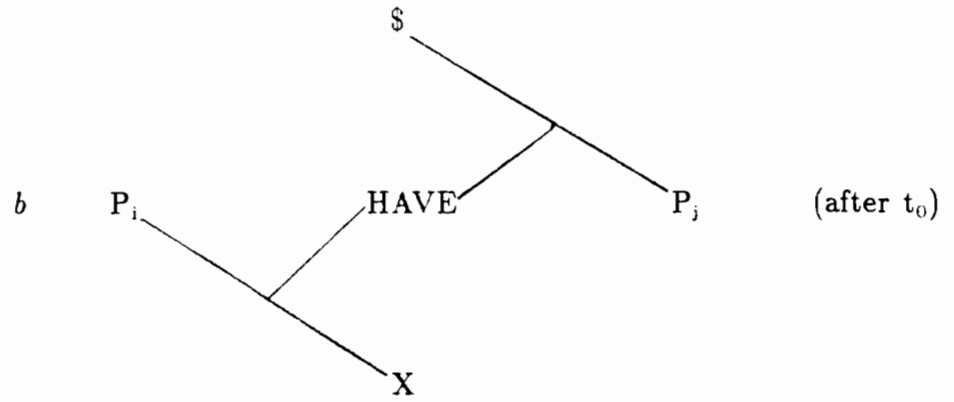
We will represent this special property by using the symbol **$** for the commodity corresponding to X_1 in the Barter frame. Unsurprisingly, this will be the base for our definition of *money.* Money ($) is a thing (thus satisfying meaning postulate (7)*b*), but in this revised frame it cannot be a VP, unlike the prior free interpretation of ***thing*** as referring equally to either NP or VP; in addition, rather than being variable in nature from transaction to transaction, like the commodities X_1 and X_2 in the Barter frame, $ is essentially a constant, varying only in terms of its measure. Its value in transactions lies not in itself but precisely in its role as a constant in transactions; it has a **meaning**, rather than a utility per se, and this meaning concerns other commodities. Hence it is a **meta-commodity**, in terms of which other commodities can be valued for transactional purposes.

We now modify (8) by substituting $ for X_1 and by removing the subscript on X_2. It will still be convenient to speak of "Commodities" in the plural or generic as referring to a member of the set $\{\$, X\}$, but we will refer to X itself as **the** Commodity element in the revised frame (10)*a*-*b*:

(10)*a*



(before t_0)



The structure of this frame sequence, and the transition rules between (10)*a* and (10)*b* are almost identical with those for (8)-(9); the only difference is that $ is necessarily not represented by a VP, but is rather a *thing* in the more ordinary, stricter sense. I claim that (10) is the minimal frame necessary for the proper definition of the word *money* in English, and that the semantics of this frame constitute, in fact, the conceptual field of MONEY to which Lakoff & Johnson refer in postulating the metaphor theme TIME IS MONEY.

Some salient features of the frame are summarized below as meaning postulates:

(11)*a*	Participants:	P_i (buyer), P_j (seller)
b	Commodities:	$ (money), X (commodity)
c	Elements:	Participants and Commodities
d	Primary Links:	(WANT P_i X)
	(before t_0)	(WANT P_j $)
		(HAVE P_i $)
		(HAVE P_j X)
e	Link Sponsorship:	(For any Participant P and Commodity X)
		(WANT P X) before t_0 sponsors (HAVE P X) after t_0
f	Link Erasure:	(For distinct Participants P and P′)
		(HAVE P X) after t_0 erases (HAVE P′ X) before t_0

Of the meaning postulates in (11), *a-c* categorize the elements of the initial frame, *d* sets up the links that structure the initial frame (before t_0), and *e-f* characterize the frame transition to the situation obtaining after t_0. We may henceforth refer to the initial frame as the CTF, with the stipulation that the transition rules be the same as *e-f*; this allows reference to both the initial and final state of affairs by means of only one representation. Thus (10)*a* is the CTF.

It is now easy to see that P_i, the participant who possesses the $ element in (10)*a*, is properly describable as the *buyer*, while P_j, the participant who possesses the X element, is the *seller*. The differentiation in roles is clearly a result of the designation of $, the only change made in deriving the CTF from the Barter frame. Thus we may properly say that *buy* and *sell* are definable only in terms of *money*, which itself is definable only in terms of the CTF.

The two English verbs *buy* and *sell* have bedeviled linguists for some time. In generative theories they were prime examples of the failure of prelexical syntax to derive one word from another; neither one of *buy* or *sell* can be considered more basic than the other, and any analysis that derives one from the other lays itself open to charges of arbitrariness, at least in English.

In early Case Grammar (Fillmore 1968), they could be easily described in terms of Agent and Patient roles, but the fact that there are two Participants involved in the CTF obscured the fact that different people are implicated as the Agents of these two verbs. In addition, the fact that an event of buying is also an event of selling is not derivable from these Case Grammar specifications, though Fillmore specifically attempted to remedy this lack with his revisions in Fillmore (1977).

In defining these and other lexical verbs with respect to the CTF, I will adopt a notion of **Local Case**, in addition to, but in contrast with the **Global Case** that is a part of most Case Grammar analyses. The elements of the CTF (defined, note, solely as in (11)) will serve as case roles for Noun Phrase arguments in prototype collocations with specific predicates **insofar as these predicates are defined with respect to the CTF**. This concept is an instantiation of Fillmore's (1977) "relativization of meaning to scenes."

Predicates like *buy* and *sell*, which have their primary definition in terms of the CTF, can thus be differentiated nicely from those like *give* and *get*, which are defined with respect to more general frames. In this manner we will be able to identify special collocations of more general terms without claiming there is (say) a "Pecuniative" case in English of the same status as Agentive or Instrumental, while at the same time making the claim that certain predicates, like *spend*, do require a $ case for their proper definition.

I give below the collocational arrays defining *buy* and *sell*:

(12) *a* *buy* [P_i, X, (*from* P_j), (*for* $)]

b *sell* [P_j, X, (*to* P_i), (*for* $)]

These are abbreviations of the following tables:

(12′) *a*

CTF	*Oblig/Opt*	*Cat*	*Prototype GR*	*Role*	*Semantics*
P_i	Obligatory	NP	Subject	Agent	Human
X	Obligatory	NP	Direct Object	Pat/Trajector	Inanimate
P_j	Optional	PP	Oblique (*from*)	Source	Human
$	Optional	PP	Oblique (*for*)	Money	Measure

b

P_j	Obligatory	NP	Subject	Agent	Human
X	Obligatory	NP	Direct Object	Pat/Trajector	Inanimate
P_i	Optional	PP	Indirect Obj (*to*)	Goal	Human
$	Optional	PP	Oblique (*for*)	Money	Measure

Note that there is a great deal of similarity between the two predicates: both verbs are transitive, both have Agent subjects (though the Agents are different for each), both have Patient direct objects (the same element this time: X). Optionally, the other two elements of the frame can be referenced with each verb; the $ element may appear in a *for*-phrase (the order of optional elements in the actual sentence is irrelevant in (12)) in both arrays, while the other participant in the frame (P_j in (12)*a*, P_i in (12)*b*) appears optionally in an oblique case.

The case in which P_j appears with *buy* is the **Source** case, using the preposition *from*; with *sell*, the nonsubject participant P_i appears in the **Goal** case, with the preposition *to*. This makes P_i the Indirect Object of *sell*, which is therefore syntactically bitransitive, while *buy* is merely transitive, with no indirect object; this syntactic distinction can obscure the true semantic symmetry that these verbs display.

Semantically, the verbs refer to the same event, a frame transition as defined in (11). Since there are two human participants capable of being agents, and since the asymmetry introduced into the frame by specification of one commodity allows separate specification of the two Agent roles, *buy* and *sell* can be analyzed as the same predicate with different Agent specifications. The other difference between (12)*a* and *b*, the particular oblique marking of the non-Agent participant, proceeds from an independent principle, that of the **Virtual Path**.

The Source marking of P_j with *buy* and the Goal marking of P_i with *sell* both refer to the same **Path**. This concept is one defined in terms of locomotion, and instantiated here as an inherited feature of the Transfer frame. I would claim that this is another case of metaphor, but I will not defend that claim here; suffice it to say that there exist grounds for definition of a Path with Source, Goal, and Trajector, even though this path is only virtual — the motion referred to may be and often is entirely conceptual.

Since there are two commodities that are transferred, there are two possible Trajectors, and thus two Paths that might be referenced by Source and Goal. However, a general principle of English is that only the Path of a focussed Trajector can be referenced by these cases; in (12), it is the direct object, X, that is focussed, and the reference of Source and Goal cases in (12) is to the virtual path of the commodity X.

It is not very surprising that X is in focus and $ is not in these arrays. The potential for new information is obviously much higher for a variable like X than for a constant like $; indeed, only the variable aspects of $ may appear in the *for*-phrase that defines its syntax. $ is ordinarily a measure phrase, since that dimension of money is variable; it may also refer occasionally to different forms of measure embodiment, such as coin, check, cash, promissory note, etc, some of which differ in other aspects as well. However, nothing but a measure phrase is allowed in the *for*-phrase with *buy* and *sell*, though instrumental *with* can be used to mark the physical instantiation. Fillmore (1977:72 note 1) distinguishes between *money* as *cash*, as in (13)*a* and and as *value*, in (13)*b*:

(13) *a* I bought it with a two-dollar bill.
b I bought it for two dollars.

It is logically possible to define another verb with the same Agent/Subject as *buy* or *sell*, but with a different Direct Object:

(14) *a* _____ [P_i, \$, (*to* P_j), (*for* X)]
b _____ [P_j, \$, (*from* P_i), (*for* X)]

(14) differs from (12) in two ways: first, the Direct Object is the other commodity, \$. Second, the secondary participant (P_j in (14)*a* and P_i in (14)*b*) appears with different prepositions. This is because of the Path phenomenon; in the case of (14), the Direct Object is \$, and thus the Path is the path of \$. Hence the Goal Participant will be the goal of \$, not of X, and thus (14)*a* appears with P_j, the Goal of \$, in the *to*-phrase, while P_i, the Source of \$, appears with *from* in (14)*b*.

(14) is a definition, but it does not indicate what it defines. As it happens, there is one verb in English defined with respect to the CTF that fits the collocational array of (14)*a*, but no special verb that fits (14)*b*. *pay* has the same subject as *buy*, P_i, but it has \$ as its Direct Object. As predicted, it takes the other two elements optionally with the appropriate prepositions: *to* P_j and *for* X, thus demonstrating that the Source and Goal markings refer to the \$ path, rather than the path of X.

(14)*b*, on the other hand, can be used with *take, get, receive, accept, collect*, and of course *want*, but none of these are properly defined primarily in terms of the CTF. There is one verb, *charge*, that seems to fit definition (14)*b*, since it appears in sentences like (15):

(15) *a* He charged me \$25 for the lamp.
b I paid him \$25 for the lamp.

(15′)*a* He sold me the lamp for \$25.
b I bought the lamp from him for \$25.

parallel to the sentences in (15′), and seems to refer specifically to commercial transactions. However, *charge* does not presuppose an actual transition like that from (10)*a* to (10)*b*, unlike the other three verbs. It is more in the nature of a speech act than a commercial transaction, and refers not to the transfer of the \$ element but to P_j's act of announcing the amount of money he will accept to close the transaction.

In the prototype case we have been discussing, there is small difference between these two situations, and indeed there is a cancellable assumption associated with the CTF to the effect that if P_j *charges* P_i \$ for X, then P_i *pays* P_j. That this is merely an assumption, however, unlike the uncancellable transfer implicated by the use of *pay*, can be seen in (16):

(16) *a* He charged me \$25, but I didn't give it to him.
b *I paid him \$25, but he didn't take it.

If P_j *charges* P_i an amount of money, this act in itself does not constitute transfer of the money from P_i to P_j, while it is clear that if P_i *pays* P_j an amount of money, this act does constitute actual transfer. Thus we must note that *charge*, while defined in terms of the CTF, is not one of the primary verbs for that frame, in that it does not denote an actual transition but rather can only implicate it in the prototype frame. It is a predicate definable (in this sense, at least) with respect to the CTF, but bears on the social aspects of engaging in commercial transactions, an aspect of the CTF we have initially excluded from consideration here. One interesting aspect of this verb to which we will return in Section IV is the grammatical and syntactic status of the non-Subject Participant NP (*me* in (15)*a*), which does **not** appear with the Source preposition *from*, as (14)*b* would indicate, but rather shows up in what would appear to be an Indirect Object (i.e, Goal) role. This turns out to be related to the informational nature of the verb.

We thus have an incomplete paradigm; there are four possible primary verbs definable in terms of whether the Agent/Subject is P_i or P_j and whether the Direct Object is \$ or X. However, only three of them have lexical instantiations in English. Schematically:

(17) **Primary CTF Verbs:**

	Subj =	P_i	P_j
Dir Obj =	\$	*pay*	—
	X	*buy*	*sell*

(17) uses the identity of the Subject and the Direct Object in the local cases relative to the CTF to categorize the verbs. We can see that these are important categories by considering two cases of Advancement in English: the **Dative** construction and the **Middle** construction.

Dative constructions are those in which two noun phrases, the so-called Indirect Object and the so-called Direct Object, follow the verb in that order in the prototype clause. I say "so-called" because the grammatical status of the two NP's is hotly disputed: not everyone would call the first italicized NP of (18)*a* an Indirect Object without qualification, and not everyone would be willing to call the second one the Direct Object:

(18)*a* I sold *Frank the book.*

Even though it is clearly related to (18)*b*:

(18)*b* I sold *the book to Frank.*

in which the status of the NP's is clearer, though their order is reversed.

(18)*a* and *b* are widely represented as related syntactically by rule in one way or another. However, no purely syntactic relation that accounts for this alternation can also account for (18)*c-e*:

(18)*c* I bought the book from Fred/for Phil.
d *I bought Fred the book.
e I bought Phil the book.

In these sentences there are no NP's marked with *to*, hence no way of applying the Dative rule, whatever its nature. The non-subject participant P_j is marked with *from*, while the non-participant *Phil* is marked "benefactively" with *for*.

The P_j element cannot be advanced, as (18)*d* shows, while the non-participant benefactive can, as in (18)*e*. The operative constraint seems to be that an NP marked with *for* cannot be advanced unless it refers to the ultimate Goal of the Direct Object. Thus, in (18)*e*, *Phil* is to be understood as the person who will ultimately receive the book I bought. The constraint proposed here will account for all the facts of (18) above, as well as (19) below:

(19)*a* I paid $10 to Peter for that.
b I paid Peter $10 for that.

This seems to resemble (18)*a* in that there is an indirect object marked with *to*. Dative-movement can thus be seen as a special case of Goal Advancement; this is not strange, since the semantic prototype of Indirect Object is Goal. More specifically relevant to our discussion of the CTF, note that the nature of the Direct Object (as being either $ or X) defines the path with respect to which the Goal is determined. Thus, in the sentences in (18), which otherwise do not resemble each other syntactically, it is the Goal of the Direct Object X that may advance, regardless of its syntactic status, while in (19) it is the Goal of the path of the Direct Object $ that may advance.

This constraint is fairly well-known, of course, and this is not the whole story by any means (cf. Green 1974), nor is it restricted to the CTF. The point to be made here is merely that it is the Goal of the Path of the Direct Object that may undergo Dative Advancement, if the verb allows it at all, and that these are necessarily defined in terms of the CTF.

The other category used in paradigm (17) was the Local Case of the Agent/Subject: P_i for *pay* and *buy*, and P_j for *sell*. That this is significant is seen by consideration of the phenomenon known as Middle, as in (20)*a-b*:

(20)*a* They sold the houses rapidly.
b The houses sold rapidly.

In (20)*b*, the X element, ordinarily the Direct Object of *sell* shows up as Subject, without benefit of Passive morphology or any other overt sign of advancement. The Middle construction is heavily and idiosyncratically restricted, as (21) shows:

(21)*a* They bought the houses rapidly.
b *The houses bought rapidly.

However, the behavior of *pay* in this context yields a possible clue to the semantic constraint operative:

(22)*a* I paid $10 for that book.
b $10 paid for that book.

While it may not be the same syntactic process at work in (22) as in (20) — (22) lacks the generic feel of (20) — the two cases are formally identical, in that the Direct Object in the *a* form appears in the *b* form as Subject.

Semantically, the prototype Subjects of both *sell* and *pay* are linked in the same way with their respective Direct Objects: P_i, the Subject of *pay*, HAS $, the Direct Object of *pay*, while P_j, the Subject of *sell*, HAS X, the Direct Object of *sell*. Significantly, P_i, the Subject of *buy*, does **not** HAVE X, the Direct Object of *buy*, and we may thus entertain the hypothesis that it is for this reason that (21)*b* is unacceptable.

This hypothesis can be checked by constructing a Middle sentence with $, the frame element HAD by the Subject P_i of *buy*:

(23)*a* She bought the houses for a million dollars.
b A million dollars bought the houses.

Again, a grammatical generalization is capturable by reference to the CTF: if the predicate allows Middle at all, then it is that commodity element which is HAD by (that is, which is related by a HAVE-link to) the prototype Subject of these verbs which may appear as Subject, regardless of its syntactic status in the prototype.

To summarize: the two types of Advancement, Dative and Middle, are describable in simple terms, terms that themselves refer to the CTF, even though the syntactic relations and statuses of the elements participating in the Advancements differ. Dative, if possible at all, will be possible with the NP referring to the Goal of the prototype Direct Object of the verb appearing as the Indirect Object. Middle, if possible at all, will be possible with the Subject NP referring to the element possessed by the prototype Subject of the verb.

Both of these generalizations can be formalized for CTF verbs in terms of the HAVE-links that obtain in the CTF, either before t_0, in the case of Middle, or after t_0, in the case of Dative.

(24) **Dative:** Relevant NP (appears first of two postverbal NP's) refers to the participant P which bears a HAVE-link **after** t_0 with the commodity Q that is the prototype Direct Object of the verb.

(25) **Middle:** Relevant NP (appears as Subject) refers to the commodity Q which bears a HAVE-link **before** t_0 with the participant P that is the prototype Subject of the verb.

As can be seen, describing things in these terms reveals a surprising amount of symmetry between these syntactic phenomena, which might otherwise seem merely idiosyncratic.

We have now investigated some of the properties of the verbs *buy, sell*, and *pay*, which appear to be central to the frame in that each of them may occur in a sentence with all four frame elements specified in a regular and predictable way; and we have demonstrated that the various features needed to define these verbs and their relevant frames are independently useful in a number of ways.

There are of course many more lexical items and constructions that have relations of one sort or another with the CTF. I began this study in the hope of explaining one particular metaphor theme, and an encyclopedic account of all the relevant lexical items is outside the present scope of my goal. Accordingly, with one exception immediately below, I will pause in Section IV only long enough to use the frame definitions to look at one interesting set of lexical items, then proceed in Section V to show how the CTF can be used in mapping the metaphor theme TIME IS MONEY.

The exception is the verb *spend*, probably the most common of the CTF verbs used in the TIME IS MONEY theme; some account of how this verb works will be necessary in Section V. *spend* seems at first glance to be very similar to *pay*, which has the collocational array of (14)*a* (repeated below):

(14)*a* *pay* [P_i, \$, (*to* P_j), (*for* X)]

One may either *spend* or *pay* money *for* some commodity, though *spend* also allows the preposition *on* with the X element, as well as with an optional benefactive:

(26)*a* I spent \$25 on the lamp/my mother.
b I spent \$25 for the lamp/*my mother.
c I paid \$25 for/*on the lamp.

The major difference between these two verbs seems to have to do with the fourth element, P_j, the seller. *pay* allows mention of P_j in a *to*-phrase, which may be advanced by Dative. *spend*, on the other hand, does not allow mention of P_j at all:

(27)*a* *I spent \$25 to him.
b *I spent \$25 for the lamp to him/to him for the lamp.
c *I spent him \$25 (for the lamp).
d *He was spent \$25 (to) for the lamp.

There is simply no way to mention the P_j participant using the verb *spend*, even though it bears the major grammatical role of Indirect Object with the closely related verb *pay*. If we are to classify *pay* as a basic CTF verb, we might then classify *spend* as a non-basic one, in that it requires omission of one of the basic participants. The collocational array of *spend* is given below:

(28) *spend* [P_i, \$, (*for* X)]

We will see in Section V that this peculiarity of *spend* makes it better suited for use with the metaphor theme than *pay*.

IV. Some interesting words: *value, worth, cost*, and *price*

There are several lexical items in English having to do (more or less) with the conceptual field of MONEY whose categorial status is considerably more obscure than *buy, sell*, and *pay*, which are uncontroversially categorizable as verbs. These are *value* as in (29):

(29) *a* That painting has a value of \$5000.
b The painting has great/little value.
c I value it/it is valued at \$5000.
d You can get a \$50 value for only \$29.95.
e The painting is valuable/valueless.
f Her assistance was invaluable.

worth as in (30):

(30) *a* That painting is worth $5000.
b The worth of that painting is huge.
c The painting has great/little worth.
d I sold him $10 worth of gas/potatoes.
e The painting is worthless.

cost as in (31):

(31) *a* That painting cost (me) $5000.
b The cost of the painting was great.
c It had a high cost.
d This is virtually no-cost housing.
e We costed out that project at 5 million dollars.
f That project costed out at 5 million dollars.

and *price* as in (32):

(32) *a* The painting has a price of $5000.
b The price of the painting is high.
c That has a high price.
d I paid a price for that.
e I priced it/it is priced at $5000.
f One of the manager's jobs is to price the merchandise.
g No thanks, I'm just pricing the merchandise.
h The painting is priceless.

which can appear together in a number of idioms and special collocations:

(33) *a* You can buy it at cost, a real value.
b The picture has sentimental value, but no intrinsic worth.
c It's not worth what it costs.
d Make sure your price isn't below your cost.
e At that price, it's worth it.
f It's priced below its market value.

(29)-(33) do no more than illustrate some of the constructional types these words can occur in; clearly they are not the same, either syntactically or semantically. Equally clearly, however, they have reference to similar (though not identical) concepts, and these may be clarified by an examination of their relation to the CTF.

cost and *price* can be separated out in the first instance because they make explicit reference to the CTF, while *value* and *worth*, though they are related, have a more distant reference type. The primary frame reference for *value* and *worth* appears to be the Barter frame, particularly the WANT-links established there. These links are, of course, present in the CTF as well, and it is with reference to this much more common type of exchange that the words probably find most of their usage. However, they are definable in terms of the more primitive symmetric exchanges represented by the Barter frame, and their use in CTF contexts may then be viewed as inherited from that frame. *cost* and *price*, on the other hand, are meaningless in a Barter context, like *buy* and *sell*.

Both *value* and *worth* refer to the *d*-variables of the formula WANT (P, X, d), where *P* is a participant, *X* a commodity, and *d* the degree to which P WANTs X. In discussing these in Section II, we passed over these abstract *d*-variables without much analysis, since although the transaction cannot take place unless they are determined and are ordered appropriately, all this is presupposed by the prototype Barter frame, hence by the CTF as well. It seems, however, that there are lexical items for which they are relevant; this is independent confirmation of their status as semantic primes for the CTF.

value is the more abstract of the two, in that it refers solely to the *d*-variable, which is strictly mental and personal. One can scarcely conceive, for example, in what units *d* might be expressed. Indeed, this practical problem is precisely the one for which *money*, and the CTF, provide a solution. A clue to the reference of *value*, as a noun, comes from its derived verbal senses. There are two of these, one covert stative and one overt active. We will designate them as $value_1$ and $value_2$, respectively:

(34)*a*	P	$value_1$	X			(covert; stative)
b	P	$value_2$	X	*at* $		(overt; active)

as in (35):

(35) *a* He $values_1$ his mother's picture (highly).
b He $valued_2$ the picture at $5000.

$value_1$, a mental-state predicate, refers to the size of the degree-variable *d* that measures how much the Subject referent WANTs (to HAVE) the Direct Object referent. There is a sizable lower threshhold value for *d* in this construction, since even without the adverb *highly*, (35)*a* announces that *he* holds *his mother's picture* in high esteem. This may be due to a conventional or conversational implicature to the effect that the question would not arise if there were not some minimum degree of desire. This implies that we should define value as a non-zero degree variable *d* in WANT(P, X, d).

There is another, cancellable, presumption associated with this predicate: if P $values_1$ X, then it may be assumed that P HAS X — in fact, $value_1$ is a verb often used instead of *want* in the situation discussed in Section II, in which both HAVE(P, X) and WANT(P, HAVE(P, X), d) ($d > 0$) are true. This fact reinforces the identification of the noun *value* with a non-zero *d*.

$value_2$, on the other hand, refers to a conscious act of judgement and communication by the Subject, who announces some monetary amount (represented in the collocational array (34)*b* by the *at* $ phrase) intended to represent his estimate of the degree variable *d*. This predicate is thus best defined solely in terms of the CTF as an extension of $value_1$, which is a Barter frame predicate. The $ amount may or may not be official, since the Subject may or may not have been ceded the Authority to determine monetary values by which others are bound, and even if so, may or may not be exercising it in a given act of $valuing_2$. This distinction between acts of $valuing_2$ that are on and off the Record can introduce complexity in the form of reporting unofficial events of $valuing_2$ with *would* ((36)*a*), or using other modals to refer to the setting of official valuations (*b-c*):

(36) *a* I would value$_2$ the picture at $5000.
b That picture should be valued$_2$ much higher.
c Only the Director can value$_2$ the picture.

This latter fact helps explain why *valuable* and *invaluable* mean what they do. The modal suffix *-able* must refer to the act of valuation$_2$ itself, rather than the degree variable. Hence if X is *valuable*, it is possible for any unspecified P to *value*$_2$ it; this must mean that the degree variable *d* is very high. The negative *in-* in *invaluable* takes the modal *-able* in its scope, producing a logical decription something like (37):

(37) (FOR-ALL (P)) NOT (POSSIBLE (P, VALUE$_2$(P, X)))

in which the *invaluable* X is represented as being impossible for anybody to value$_2$.

If it is in fact impossible for any P (with or without Authority, on or off the Record) to *value*$_2$ X, even at a value of zero, then *invaluable* cannot be synonymous with *valueless*, which announces that is X is without value, that is, its degree variable *d* is zero for all P. All this computation is tedious and potentially confusing, dealing as it does with the interactions of negation and modality, a perennially confusing topic, and it is no wonder that the meaning of *invaluable* is obscure; most English speakers appear to learn it as a morphological idiom, if at all. No doubt this is helped along by the fact that the straightforwardly interpretable *valueless* exists for *invaluable* to contrast with paradigmatically.

valuable, unlike *invaluable*, need not refer only to the active *value*$_2$. The actual reference of the noun *value* is, I claim, the degree *d* to which some human *P* WANTs some commodity *X*, and this can be seen in its uses and those of the adjective *valuable* in cases where the X element is a predicate. As noted in Section II, the unmarked sense of the English verb *want* is *want to have*; however, one can use the verb with almost any predicate as a complement, and the senses of *value* and *valuable* in these constructions are precisely comparable to the senses we have been constructing for them here. For instance, in (38), the underlying context has to do with the desire to *use* this drug to treat hypertension, rather than to possess it.

(38) This drug has value/is valuable in treating hypertension.

While *value* is an abstract noun whose primary definition is associated with WANT rather than any transaction frame per se, *worth* definitely has to do with transactions, though not necessarily with the CTF. *worth* can be meaningful in the context of any trade, whether actual or merely potential, and thus can be defined in terms of the Barter frame. The major difference between this frame and the CTF, recall, is that Barter does not include any designated $ element; otherwise the frames are identical in structure and meaning.

Whereas *value* is itself a noun, and refers to a non-zero degree variable *d*, *worth* is a transitive adjective whose complement is a non-zero *d*, stated in terms of some *X'* in a (real or potential) transaction definable with respect to the Barter frame — though often used with money words from the CTF. Evidence for this comes from (39):

(39) *a* The book is worth $25.
b *The book is worth.
c *The worth book is on the table.
d *The worth $25 book is on the table.
e The book worth $25 is on the table.

in which we see both that *worth* must be a predicate adjective and that it must be transitive. (40) gives the conditions for its use:

(40) X (*be*) *worth* X′ (*to* P)
(*a*) *X* and *X′* are Commodities and *P* is a Participant in a potential Barter frame; no transaction is necessarily implied.
(*b*) HAVE (P, X) (either before or after t_0)
(*c*) WANT (P, X, d)
(*d*) WANT (P, X′, d′)
(*e*) d $\geq$ d′

Note from Condition (*e*) that the value of d, the degree to which P WANTs X, must be greater than or equal to the value of d′, the degree to which P WANTs X′. This has the effect of making any announced value of X′ a **minimum**. That is, if X is *worth* X′, then it may be worth even more. This, in turn, implies that the word is used with a complement implicating a measure of some kind, either of money (thus invoking the CTF), or some other quantifiable commodity.

worth is often found, in fact, in a classifier-like construction that quantifies nouns, both mass and count, in terms of their monetary value, as in (30)*d* (repeated below):

(30) *d* I sold him $10 worth of gas/potatoes.

and is also frequently used with the pronoun *it*, most commonly with an overtly unbound referent, as in (41):

(41) Is this really worth it?

The pronoun refers contextually to the sum of whatever has been or may be exchanged for the referent of the Subject of *worth*. This *it* shows up in another interesting syntactic construction with *worth*:

(42) *a* A computer is worth having.
b ??It's worth having a computer.
c It's worth it having/to have a computer.
d Having a computer is worth it.

In (42), note first of all that there is a verbal complement *having* involved. This verb refers to the state of having a computer; *have* is of course already a stative verb, but this is not a requirement. Active verbs can be used, although the reference will be to the perfective state of having done whatever action the verb describes. Note also that there are two *it*'s in (42)*c*: the *it* of extraposition and the nonspecific *it* of *worth it*. Both of these seem to have the same flavor of dummy syntactic elements, even though the second one cannot be attributed to the same type of dummy-creating rules as the first. It may be that this *it* is caught here in the first stages of the process by which a referential NP becomes an idiomatic dummy.

worth participates in a number of other idiomatic constructions, for instance:

(43) *a* That's worth money.
b That's worth whatever it costs.
c That's worthless.
d That's not worth a damn.
e What's it worth to you?
f How much is it worth to you?

The sense of (43)*a* is that *that* is worth a considerable amount of money, evidence of the minimum threshold for *worth*; in *b*, we see that the complement of *worth* is to be identified with the complement of *cost*, at least in contexts where they are both meaningful, i.e, the CTF. This identifies the *d*-value of X in terms of what it might be exchanged for in the CTF, namely $. *c* shows the negative compound *worthless*, which is pejorative, like *valueless*, but unlike *priceless* or *invaluable*. *worthless* simply announces a zero degree of desire; this is the predictable negation of condition (40)*e*, that the degree of desire be greater than or equal to what one could exchange for it. Since the exchange value is unspecified, but a degree of desire of zero is announced by *worthless*, it must be the case that there is nothing one would exchange for it.

Similar remarks apply to (43)*d*, an example of the open "minimal Direct Object" class of Negative Polarity Items (cf. Horn 1972); if *that* is not worth even a damn, it's worth nothing. Finally, the distinction between a general interrogative *what* and the quantified interrogative *how much* shows the difference between the more general definition of *worth* with respect to the Barter frame and its more limited definition with respect to the CTF. While (43) *f*, with *how much*, must be answered with a measure phrase in terms of *money*, the more general (43)*e*, with *what*, need not be, and may in fact refer to a verbal complement.

To summarize our discussion of these two predicates, we have seen that both *value* and *worth* can be defined with respect to parts of the Barter frame that are inherited by the CTF. *value*, a noun, refers directly to the degree of desire *d* of a Participant P for a Commodity X in the formula WANT (P, X, d), without reference to any degree of desire *d'* of that Participant for any other Commodity X'; they have independent *values*. *worth* also expresses the *d*-value of one Participant for a Commodity, but in comparative terms of what might be exchanged for it. For this reason, it makes sense for *worth* to be a transitive predicate, in order to express the comparison.

At first glance, *cost* and *price* seem to be an opposed pair of lexical items, though not in the same sense of opposition as *buy* and *sell* — for one thing, *price* is a noun while *cost* is a verb — but available for antonymy under some circumstances. Clearly these are lexical items defined, like *money*, with respect to the CTF, since they make no sense outside of a commercial transaction. In a barter transaction, one does not speak of *price* or *cost*, though *value* and *worth*, as we noted above, can have useful definitions in that situation.

Both *cost* and *price* refer to the $ element of the CTF. There are antonymous nominal senses of both words that, like *buy* and *sell*, appear to refer to much the same thing, but from the viewpoint of different participants. *price*, in this sense, can be thought of as what the buyer must pay in some transaction, while *cost* is then what the current seller has already paid (in the role of buyer) in some prior transaction in order to come to HAVE the commodity in question. This opposition, which is exemplified in (33)*d* (repeated below), is different from that between *buy* and *sell* in that *cost* and *price* do not refer to the same transaction.

(33) *d* Make sure your price isn't below your cost.

That is, unlike *buy* and *sell*, which are opposed primarily in the dimension of **viewpoint**, this case appears to use an additional oppositional dimension of **transaction** as well. We may say here of *price* and *cost* that their difference is not only (holding the transaction fixed) between the viewpoints of two participants, but also (holding the viewpoint fixed) between the present transaction and a prior transaction in which the current seller took the role of buyer. These uses of *cost* and *price* invoke a **history**; but this history need not always be invoked. There are many contexts in which *cost* and *price* are effectively synonymous, so that a paraphrase of (44)*f* below might be (44)*g*, with *price*.

In addition to having a nominal sense, *cost* is a verb defined with respect to the CTF. The Subject of *cost* appears to be X; however, the roles of the $ element and the optional Participant with this verb are more difficult to categorize:

(44) *a* That cost me a lot of money.
b *That cost a lot of money from/to me.
c That costs a lot of money.
d That cost me.
e That really costs.
f How much does it cost?
g What is its price?

To begin with, note that any participant NP (e.g., *me* in (44)) must appear immediately after the verb, like the Goal NP in a Dative construction. But this construction seems to have the wrong semantics to be a Dative; *me* refers to the Source of the money in the transaction, not its Goal. Furthermore, as (44)*b* shows, the optional participant may not appear in a prepositional phrase; neither the *to* of a Goal nor the *from* of a Source is allowed. On an ordinary analysis, then, it is unclear how the Participant NP could be a Goal. However, as we will see below, on a somewhat different analysis this can be reasonably maintained.

There is also small syntactic evidence for the Direct Object status of the $ element with *cost*, since Passive may not be applied to promote $ (nor for that matter, the Participant) to Subject status:

(45) *a* *$50 was cost (me) (by that).
b *I was cost $50 (by that).

Still, there is precedent for the inability of Passive to apply to measure NP's that are Direct Objects; stative *weigh* in (46)*a*, as opposed to active *weigh* in (46)*b*, takes a measure phrase as Direct Object, and Passive cannot apply to it, as (46)*c* shows.

(46) *a* The man weighed 200 pounds.
b The man weighed the truck.
c *200 pounds was weighed by the man.
d The truck was weighed by the man.

We can then tentatively identify the $ constituent of a prototype *cost* sentence as its Direct Object, with the emendation that it be a measure phrase. We will return to the question of Indirect Object presently.

This verb *cost* is a stative verb, a member of the irregular monosyllabic *t*-final zero-past-suffix verb class, like *cut* and *spit*. It can occur without a participant, as in (44)*c* above, without a $ element but with a participant, as in (44)*d*, or without either one, as in (44)*e*. If the participant is not specified, the implication is that the cost is or would be the same for anyone, while if the $ measure phrase does not occur, the implication is that it would be very large, perhaps too large. This is evidence of a positive threshhold value for the $ element.

There is a derived active phrasal verb *cost out*, with an Agent (possibly, though not necessarily, a Participant) subject and a Commodity direct object, which requires the preposition *at* to express the $ element, as in (47) below. It is rather technical in its meaning: to determine cost, either in advance of some complex transaction such as entering a bid, or by constituent analysis of some ongoing process. I have also heard on occasion a similar technical use of the verb *cost* without the particle *out*; my impression is that these uses are largely restricted to the field of Cost Accounting and its ilk. Since I am not attempting to cover the technical usages of money terms here, this observation represents the furthest I intend to go in that particular direction.

(47) He costed/*cost that (out) at $150,000.

Interestingly, the morphology of this verb is regular, with the ordinary English *-ed* allomorphs for both Past and Participle forms. Regularization such as this is fairly common with reified terms or compounds derived from irregulars, as shown by the use of regular forms for the causative of *shine*: *shine, shined, shined* versus irregulars for the stative: *shine, shone, shone*; or by the unacceptability of the irregular compounds **New English Boiled Dinner* and **Toronto Maple Leaves*.

Whereas an argument may be made for *cost* being basically a stative verb, with derived active verbal and nominal senses, it seems clear that *price* is basically a noun. There are, to be sure, verbal senses of *price*, but they are equally surely derived, as (32)*f-g* (repeated below) shows:

(32) *f* One of the manager's jobs is to price the merchandise.
g No thanks, I'm just pricing the merchandise.

As a verb, *price* seems to mean **either** to set the price for a transaction ((32)*f*: part of P_j's script) or to find out the price set for a transaction ((32)*g*: part of P_i's script). This ambiguity of the two verbs *price* is very reminiscent of the well-known vagaries of noun-derived verbs, such as *seed* in (48):

(48) *a* He was seeding the lawn.
b He was seeding the pepper.

The verb *seed* in (48)*a* means to put seeds into the lawn, while in (48)*b* it means to remove seeds from the pepper. This distinction is due to the context-sensitive nature of the process of deriving a verb from a noun; it is part of our ordinary knowledge about horticulture that one must put (grass) seed on lawns, while peppers already have seeds, which must be removed to prepare them as food. Similarly, it is part of our ordinary knowledge about conventional commercial transactions that merchants (potential sellers; P_j) must set prices for transactions, while consumers (potential buyers; P_i) must find out what prices are set to participate in a transaction.

Two important points emerge from this evidence. First, both of the possible activities denoted by the derived verb *price* take place in anticipation of the consummation of a transaction, like the noun *price*, which refers to the current transaction, but unlike the contrastive sense of the noun *cost*, which refers to an already completed transaction. We may thus speculate that some tense, aspect, or modal distinction is being made here; for instance, one between *cost* as invoking a perfective aspect or a factive mode, and *price* as invoking a future or irrealis aspect, or a potential mode.

Second, it appears that both meanings of the verb *price*, as well as the meaning of the derived active verb *cost (out)*, have to do more with the generation and transfer of **information** about the size of the $ element in some transaction than with an actual transfer of funds. This interpretation is supported by the fact that all of them can be accurately paraphrased by the phrase *determine the price/cost*, which may mean either to set a price or cost, or to find it out, and which is crucially concerned with information.

The verb *charge*, which we discussed briefly in Section III, is also concerned with transfer of information rather than money, and it is notable that it, too, is ambiguous, in this case between the sense of (15)*a* (repeated below), which has P_j as Subject and P_i in an anomolous Goal-Advanced role, and a different reading with P_i as Subject and either commodity as Direct Object ((15)*c-d* below), which deals with Credit, another instance of information transfer.

(15) *a* He charged me $25 for the lamp.
c I charged $25 at Macy's.
d I charged the lamp at Macy's.

The aspectual/modal distinction between *cost* and *price* also helps explain the meanings of their respective negatives. There is no word **costless* in English, but *free* is its suppletive equivalent, just as *ever* suppletes for **anytime(s)* in negative polarity environments (except for the grammar of street signs like ***NO PARKING ANYTIME**, which obviously would be phrased **NO PARKING EVER** in standard English). There is, however, a lexical item *priceless*, and its meaning is very far from that of *free*. If *cost* and *price* are understood as perfective/factive and anticipatory/potential, respectively, then their compounds with *-less* should refer to quite different epistemological situations.

Under this analysis, if there is or was no **cost** in some transaction, the understanding would be that $ is in fact equal to zero in that transaction, which is the ordinary meaning of *free*. The transaction is not understood as not taking place, but it is effectively one-sided — an instantiation of one real Transfer only, of X from P_j to P_i, without a corresponding Transfer of non-zero $ the other way. This is a degenerate case of the CTF, thus a deviation from the prototype, but a transaction nonetheless.

On the other hand, if there is or can be no **price** in a potential transaction, then it is reasonable to understand that, because of the nature of the X element, or the desires of the seller P_j, there can be in fact no $ element in any putative frame, and therefore that no transaction involving this X element can or will take place, hence the usual meaning of *priceless*.

This contrast is a close parallel to that of ***invaluable*** versus *valueless* and *worthless* discussed above. Like the negative *in-* of ***invaluable***, the negative *-less* of *priceless* takes a modal (in this case the potential mode posited for *price*) in its scope, with the result that instead of implying that the $ element is equal to zero, like *free* (parallel to the implication of *valueless* that *d* equals zero), *priceless* implies that there can be no $ element at all (parallel to the implication of ***invaluable*** that there can be no officially fixed *d*-value). Thus, in both cases involving negatives with possibility modals, the conclusion is that no transaction is possible. The parallel is made closer by the fact that in the CTF it is often convenient to indicate *d*-values in monetary terms, thus producing an effective equivalence between *d* and $ in many conventional contexts, and practical synonymies between ***invaluable*** and *priceless*, on the one hand, and *worthless* and *valueless*, on the other.

Another illuminating contrast between the two lexical items *cost* and *price* comes from their nominal constructions with Participant NP's. Two examples are the use of a Participant as a Genitive with the nouns *price* and *cost* ((49)*a-c*), and as a Dative in construction with them (*d-e*). (The Commodity X may also be used in the genitive with either noun, though this usage presents no difficulties: *X's cost, X's price, the cost of X*, and *the price of X* are straightforward enough.)

(49) *a* Macy's cost(s) is/are lower than Gimbel's.
b &Macy's price is lower than Gimbel's.
c Macy's prices are lower than Gimbel's.
d The cost to Macy's is $19.95.
e The price to Macy's is $19.95.

Unlike (49)*a*, in which *cost(s)* refers explicitly to the amounts of money paid **by** Macy's and Gimbel's (in the P_i role), *b* is ambiguous between a reading synonymous with *a*, and one in which *price* refers to the amounts of money that must be paid **to** them (in the P_j role). The synonymous (P_i) reading is all but impossible when *price* occurs in the plural, as in *c*, since the implication of *b* on that reading is that the *price* referred to is a special one, quoted in a particular case for Macy's alone, and this is unlikely in the general situation implied by the plural. This reading is also less likely in context with the potentially contrastive use of *cost(s)*, since we would expect the contrastive reading of (49)*b* to be a logical commercial consequence of *a*. There is thus a potential role reversal involved here.

On the other hand, with a *to*-phrase the Participant roles cannot be reversed like this. In (49)*d*, *Macy's* has the P_i buyer role, and this is also true in (49)*e*. Thus, *the cost to Macy's* is synonymous with *Macy's cost*, but *the price to Macy's* can only be synonymous with the first (P_i) reading of *Macy's price* in *b*, since *e* implies that the *price* is a special one, for Macy's alone, while the *cost* in *d* is understood as a general one, not restricted to Macy's.

This phenomenon is perplexing in two ways:

1. The preposition *to* is typically the mark of the Goal case, but the object of *to* in (49)*c-d* appears to be, if anything, the Source of the $ element in the transaction. This relates to the problem (mentioned above) of determining the Role of the first postverbal NP (the putative Indirect Object) with the stative verb *cost*, as in (44)*a* above.
2. There is no obvious reason why a genitive NP could occasion a potential role reversal, while a dative one would not. Put another way, there is no apparent cause for the potential invocation by *cost* of a transaction history in the genitive construction, but not with the *to*-phrase.

The first problem seems to lie with the identification of the Path; if there is any Path referenced by a Goal or Source here, then something other than the $ element itself appears to be the Trajector, yet that is the element one would expect to be Trajector. Note that the optional Participant with the stative verb *cost* in (44), while it may not appear with any preposition, occupies a syntactic slot consistent with obligatory Advancement of a Goal Indirect Object; that is, even though (50)*a* is ungrammatical, like (44)*b* and (45)*a-b* above, (50)*b* and *c* are both synonymous and grammatical:

(50) *a* *That lamp cost $50.00 to me.
b That lamp cost me $50.00.
c The cost of that lamp to me was $50.00.

I believe that there is a Path here, but it is not the path of the $ element. Rather, it is the path of **information** regarding the size of that element. As we noted above, this seems to be a crucial part of the meaning of both *cost* and *price*, as evidenced by the senses of their derived active verbs. I would maintain that both these words, whether used as nouns or verbs, refer not so much to the $ element per se as to its size. This information is construed as being transferred (cf. Reddy (1979) on the **Conduit Metaphor**, which develops this notion of information transfer more fully), traversing a Path to an Experiencer Goal, who must be a Participant, since only Participants may be Experiencers in the CTF.

This ramification of the meanings of both *cost* and *price* helps in untangling their senses in terms of the CTF. The Path of the information has its Source in the Participant who decides it (the seller, P_j) and its Goal in the Participant who receives it (the buyer, P_i); this accounts both for the occurence and the synonymy of *to me* in (50)*c*. The *to*-phrases can be seen as referring in each case to the Goal of the information, and since the Goal in both cases is P_i, these phrases will pick out the same Participant, no matter which word is involved as NP head. It also accounts for the interpretation of *me* as a Goal-Advanced Participant with *cost* in (44)*a* and (50)*b*, as well the same phenomenon with the Information-Path verb *charge* in (15)*a*. It does not, of course, account for the obligatory nature of Goal-Advancement with these verbs.

It also, rather surprisingly, may help account for the variety of senses available with genitive constructions, since the meanings of *cost* and *price* in the *to*-constructions can now be seen as governed by the implied Paths of the Dative, while this is not the case with genitives, which are free to invoke the history that is barred by the Dative Path interpretation. In addition, if *cost* and *price* refer to information, this puts them into the category of content ("picture") nouns, which are prone to behave in quite variable ways with possessives, and in fact to generate ambiguities quite similar to the one in (49)*b*. I will not pursue this issue here, but see Section V for more discussion of some of the vagaries of picture nouns.

To sum up this section: we have paused for a lexical excursus to show how all four of these interestingly similar yet distinct words can be examined and potentially defined in useful ways by reference to the CTF, its predecessor the Barter frame, and their various constituents. Analysis using this method has several benefits, not the least of which is the possibility of explaining some of the otherwise unaccountable grammatical behavior displayed by these lexical items, as well as giving a more unified account of their similarities and differences.

V. The TIME IS MONEY Metaphor Theme

In this Section, I will indicate how the specifications of the Commercial Transaction Frame are to be utilized in dealing with the TIME IS MONEY metaphor theme (hereinafter TIM), as described in L&J. I said in Section I that the statements in that work could not "substitute for a more explicit portrayal of the semantic relationships that they claim obtain." Now, having developed a semantic analysis for the realm of *MONEY*, we are in a position to see just how these metaphoric relationships may be more explicitly portrayed.

The gist of L&J's TIM thesis is that instances of reference to time occur which use lexical items properly definable only in terms of money (as we have seen, this means the CTF or its predecessor frames). One of the most common of these is the verb *spend*, and we will see it in a number of examples illustrating the theme. First, however, some discussion of *time* is in order.

One of the purposes of a metaphor (and a principal one of this metaphor) is to account satisfactorily for some phenomenon which is not clear — to make it at least seem clear. **Time**, the subject of this metaphor, appears to be a good candidate for such a status; few basic aspects of human experience are understood as poorly as it is. The TIM theme seems to deal only with certain parts of our perception of time, notably what I will call **Perceived Duration**. *Duration* is time that passes in quantifiable amounts to which we refer with the standard time units of minutes, hours, days, etc. — the *Perceived* part is due to the fact that the TIM theme always refers to duration from the viewpoint of some individual's perception of it.

This is not the place to give a full description of TIME IS SPACE, the other major metaphor theme in English with TIME as its subject. However, we should note that one concept from this theme permeates virtually all discussion of duration: **linearity**. Duration is usually considered as a *length* of time, like a segment of a line, and is contrasted with events or *points* of time on the same metaphoric line.

Most languages distinguish between the two types of time reference (called **durative** and **punctual** in most technical analyses). For instance, in English *ten years ago, at 5 PM, on Tuesday*, and *now* are punctual, while *since ten years ago, after 5 PM, until Tuesday*, and *never* are durative. This is the temporal equivalent of the **mass/count** distinction in nouns, and indeed when duration is expressed by a noun, it is a mass noun and must be counted with classifiers, like other mass nouns in English. The durative/punctual and the mass/count distinctions are the same as analog/digital or continuous/discrete — a matter of individuation.

The concept of perceived duration is one in which a human Perceiver (all prototype Agents are Perceivers, though the reverse is not necessarily true, so I will adopt here the policy of including Agents in the reference of the term *Perceiver*) experiences Time "passing" (a motion term from the TIME IS SPACE theme) in quantifiable ways. Time in such a concept is never perceived alone; it is always a concomitant, a measure, of some other durative perception or action of the perceiver, which is said to *take (so-and-so much) time*, or to *last (so-and-so) long*. The quantization of duration is normally achieved simply by noting commensurable (collinear) points at the beginning and end of the durative event and performing subtraction.

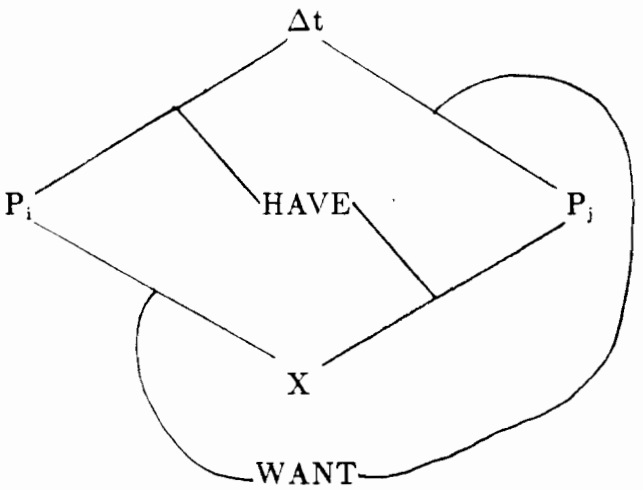
Since it is a common proverb, part of our cultural heritage, the phrase *Time is money* is a familiar one to English speakers. It is important, however, to distinguish between the proverb *Time is money* and the TIM metaphor theme. As an admonitive proverb, this phrase is ordinarily used to imply that one can exchange one's experiencing of duration for actual money, provided appropriate actions are performed at appropriate speeds while the time is being experienced, and therefore to encourage the performance of those actions at those speeds. This is simply an encoding in proverbial form of our experience of economic labor, particularly timed labor, coupled with admonitions to adhere to expected economic behavior. Pragmatically, it is often used to urge greater speed. As such, it is **not** the same as the TIM theme.

What a metaphor theme does is **license** certain conceptual liberties; in the case of the TIM theme, the liberty is that of *talking* of time (hereinafter *time* is used only in the sense of perceived duration, unless otherwise noted) as if it were some species of money. Depending on where one stands with respect to L&J and the Sapir-Whorf hypothesis, one might consider *thinking* of time in these terms as part of the license as well. Obviously this goes far beyond simple economic behavior; it is in this sense that the license of the TIM theme is to be distinguished from the proverbial sense attached to the phrase "Time is money." How this feat might be accomplished psychologically is beyond the scope of this study; we will concentrate on the linguistic issues.

Most of these issues have to do with the congeries of idioms, collocations, and selectional restrictions in which lexical items properly definable with respect to the CTF are found in construction with words and phrases denoting time. The argument is that a regular alteration of the CTF (a **Frame Mapping**) can account for these; such a general account is to be preferred to the alternative, which is to account for each instance on an arbitrary basis. This is a variant of the "generalization-capturing" type of linguistic argument, and, as pointed out in Lawler (1983), is the epistemological basis of L&J's theory, as well as most other modern linguistic theories. This mapping will be developed as a systematic set of relations between the CTF and a different frame defining the contextual field for this particular type of temporal reference. We will represent the new frame as TIM(CTF), that is, the frame consisting of the image under the TIM mapping of the CTF frame; similarly, the image under this mapping of any individual element of the CTF (say, P_i) will be represented as TIM(P_i).

In this frame mapping, it is obvious that the crucial element of the CTF is \$. When we derived the CTF from the Barter frame, we introduced one additional piece of information into the system by specifying one of the interchangeable commodities as a meta-commodity. We have seen how the asymmetry produced by this information generated a considerably enhanced semantic field, with its own array of lexical items. The metaphoric equation licensed by the TIM specifies that this element \$ be mapped into a representation of *time*. Accordingly, we begin by replacing \$ in (10)*a* with its image, TIM(\$), designated Δt; the other elements are represented initially as mapping into themselves (identity transformations), an oversimplification which gives us a starting point. This initially revised frame is shown in (51):

(51)



(51) is a first approximation only, and has some serious problems, mostly in figuring out how to revise the interpretations of the frame elements in the light of the substitution. To begin with, the nature of the image of the *X* element is now quite indistinct. In (10)*a*, the CTF proper, it was easy to use it to represent some commodity that could be transferred from one party to another in an exchange; in (51) this will not work. Further modification of TIM(X) appears to be in order.

Second, while P_i seems readily adaptable to a role of duration Experiencer in that it represents a human participant with a viewpoint, P_j has no apparent interpretation at all in the revised frame. P_i is identified in (51) as the participant who *has* the Δt element; while we have yet to specify the actual meaning of that relationship or of the WANT-link, it is clear at least from the idiomatic evidence of the use of possession verbs with temporal expressions in (52) that P_i's viewpoint is the critical one here. Hence it appears that TIM(P_i) is in fact just P_i, so it is an identity transformation. As for P_j, we will see below that the lack of an interpretation for this element has a critical effect on the metaphor.

(52) *a* I don't have the time for it now.
b If I get the time, I'll do it later.

Finally, recall that the transition between (10)*a* and *b* (the actual commercial transaction) was a discrete temporal one, occurring at a virtual instant t_0; it is simply not clear how such a transition might be handled in a frame where one of the elements is itself temporal in nature. The question is whether the temporal reference of t_0 is consistent with the temporal reference of the element Δt. (51) does not clarify very much the nature of Δt, though we might expect that such a desired effect would have to await a better-specified frame; we will return to this issue after further augmenting the transformed frame.

Of the frame elements, P_i presents relatively few problems, P_j seems to represent another issue altogether, and the point of the exercise is to see whether the nature of Δt can in fact be clarified by adjusting the other elements in the frame. We will accordingly begin with **X**.

Since P_i is the Perceiver with respect to the Δt element, and since P_i must also bear a relation of some sort to the X element, it is necessary that TIM(X) be something that can be experienced appropriately as a durative perception by P_i. Obviously a physical object will not suffice; indeed, no noun at all will work. What we need as the image of the commodity is a verb; more correctly, a Verb Phrase of some sort, like the cases discussed briefly in Section II.

In particular, this VP must be one which both is durative and allows a human Perceiver (or Agent) role argument in the form of P_i. We will typically expect P_i to be the Subject of the VP, though this is not necessary. The actual syntactic nature of the VP is not specified; since many predicate adjectives are stative (and therefore durative), we might expect that the VP could as easily be a $\bar{A}$ as a $\bar{V}$.

For this specification to work properly we need an additional meaning postulate to the effect that P_i experiences both the VP and the passing of Δt units of duration simultaneously. This concept of **durative simultaneity** is somewhat different from the punctual concept of simultaneity used to coordinate the two transfers of the Barter frame at the same virtual instant t_0. In that frame, and the CTF, there is no recognition of duration as such, and possession of either commodity is totally vested in one or the other participant at all times, with a discontinuity only at the instant t_0; the transfer is discrete. In the frame we are deriving here, on the other hand, a continuous analog of the transfer is introduced.

This is actually a result of the introduction of the Δt element. **Continuity** is one of the most profound differences between any concepts of *time* and *money*. While units of money are easily perceived as exact count nouns, units of time are at best inaccurate measures of its passage. In addition, while the rate at which we acquire and spend money is all too variable, the rate of passage of time is not only continuous but **constant**. The familiar $\frac{dy}{dt}$ of differential calculus is a function representing the instantaneous rate of change of the function $y = f(t)$ with respect to the time variable t; this function may be quite a complex one, depending on f. By contrast, $\frac{dt}{dt}$, the time rate of change of time itself, is by definition a positive constant, and it is as such that we perceive it in the terms of the new frame.

spend is, as noted, one of the most common verbs used in TIM(CTF). (54) shows the differences in the roles of the various elements in (53)*a*, an ordinary CTF use of *spend*, and (53)*b*, a metaphorical one licensed by the TIM.

(53) *a* He spent his money at the racetrack.
b He spent his time at the racetrack.

(54)

	CTF/TIM	Element	Lexical Item	Role
a	CTF	P_i	*He*	Agent/Source
		\$	*his money*	Patient/Trajector
		X	[none present]	Bets? [invited inference]
		(Locative)	*at the racetrack*	Locative
b	TIM	P_i	*He*	Agent/Perceiver
		Δt	*his time*	Perceived Duration
		VP	*(be) at the racetrack*	Durative Perception

Several things are worth noting about these sentences and their interpretations. First, the phrase *at the racetrack* is merely a locative in (53)*a*, a type of phrase that can occur with practically any sentence, and therefore not an element in the CTF at all. Even though its use invites the inference that he spent his money on bets at the racetrack, this is not a direct reference to X, since (53)*a* would be equally true if he had spent his money on food and drink there, rather than bets. X is simply not specified in (53)*a*. In (53)*b*, on the other hand, *at the racetrack* is the VP element, TIM(X), and has a role to play in the frame mapping. Since being located in a particular place is stative and therefore durative, and since humans can experience locomotion, hence their own locations, being at the racetrack qualifies as a Durative Perception.

Second, note that the lexical item *time* is a precise map for the lexical item *money*. This is a nice literal reification of the TIM theme. Both are mass nouns, both are capable of modification with a personal possessive (*his* in this case), and most importantly, both are grammatical as the Direct Object of *spend*.

Third, there is no image under the map of the notion of Virtual Path, or of the roles defined with respect to it — Source, Goal, or Trajector. There may of course be reference to motion, but it is not the virtual motion of \$ from P_i to P_j, or of X from P_j to P_i, that characterizes the CTF. This entire functional apparatus does not survive the mapping. In (53)*b*, no element has a role of Source, of Goal, or of Trajector, and it is difficult to see what any such role might mean in this context.

Again, the difference has to do with the continuous (in fact, **constant**) nature of experienced duration, as opposed to the discrete frame transition of the CTF. In the TIM map, Δt is continuously decreasing, while P_i's cumulative experience of VP is increasing at the same rate. There is no transfer of Δt from P_i to another participant, or of VP from another participant to P_i. One might say that Δt **leaks**, rather than that it is transferred. There is no way to make sense of a transfer, nor of a Path, nor of any role available for an additional participant. Hence (with one trivial exception to be discussed presently) there is no map image of P_j under the TIM mapping.

All this shows that TIM is at best a partial mapping. Of the four basic elements of the CTF, only three have images under the mapping:

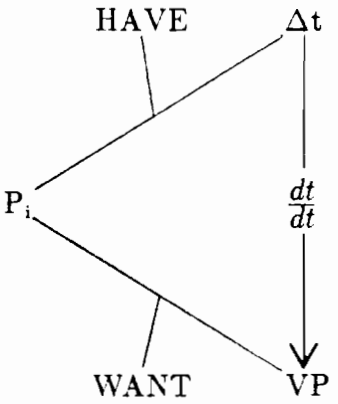
(a) $TIM(P_i) = P_i$. (An identity transformation)

(b) TIM(\$) = Δt. (Money maps to Perceived Duration)

(c) TIM(X) = VP. (Commodity maps to Durative Perception)

and there is no $TIM(P_j)$. We can now present (55) as a partial revision of (51):

(55)



(P_j omitted)

The nature of the temporal transition between (55) and its successor frame, indicated above by the directed link labelled as $\frac{dt}{dt}$ between Δt and VP, is to be understood as continuous and constant. Under such a non-catastrophic interpretation, the CTF functions of Sponsorship and Erasure cannot have the same meanings. Recall that in the CTF, a WANT-link before t_0 sponsors a HAVE-link after t_0, and a HAVE-link after t_0 erases a prior HAVE-link. Since the nature of these link modifications in the CTF depends on the nature of the links themselves, and since this is a matter of the semantics of the WANT and HAVE relations, it appears to be time to investigate their fate under the TIM mapping.

As far as Possession is concerned, there seems to be little difficulty extending the concept to the possession of time. While *meus et tuus* is understood by every watchdog, it is nonetheless true that grammatical possession in the form of the uses of genitive expressions or the verb *have* is one of the most general and least restricted semantic relations. One can, for instance, use the phrase *Bill's picture* to refer to:

- a picture that Bill is currently holding in his hand
- a picture that depicts Bill
- a picture he painted or plans to paint
- a picture he sent to his sister
- a picture his sister intends to send him next week
- a picture he owns (but which is currently on loan to the Art Institute)
- a picture that hangs on the wall of his den (but which belongs to a rental gallery)

...or even merely a picture he has mentioned in our hearing. Almost any relation will do in a case like this.

Of course, *time* is not a picture noun, nor are any of the temporal measure phrases used for Δt; as such, it does not have quite as much freedom with regard to genitives and possession generally. In particular, it makes little sense to speak of anyone *having* time or any measure of it in most of the senses exemplified in the preceding paragraph. Nevertheless, we do quite commonly refer to time using the verb *have* and other genitive constructions, as shown in (52)*a* (repeated below) and (56):

(52) *a* I don't *have the time* for it now.

(56) *a* *Your time* was well spent there.
b Thank you for *your time.*
c I *have an hour* available on Tuesday.
d I *had eight hours* of sleep last night.
e I can't function *without eight hours* of sleep.
f I'm not sure I can *get the time* I need.

All the constructions in (56) show that one generalizes possession to the case of perceived duration by considering the Perceiver to be the possessor of the (measure of) duration. I noted above that there was one trivial exception to the conclusion that P_j has no image under TIM(CTF), and to the lack of Path phenomena. Now that we have established the generalization of possession under the mapping, we have a venue for dealing with it. The data are provided by the existence of datives (putative Goals of a putative Path) with some predicates involving what looks very much like a Δt direct object, as in (56)*g-i*:

(56) *g* She generously gave/contributed/donated her time to the charity project.
h Could you give me a few minutes?
i I can let you have an hour at 9 tomorrow.

These cases would appear to treat *time* as a transferrable object with a Path from the possessor (or Experiencer, in the sense just established) to a receiver. This seems to be the same path traversed by the $ element in the CTF, from P_i to P_j, in which case this would be a counterexample to the claim that there is no image of the P_j element or of Path phenomena referencing it under TIM(CTF). If we are to generate the image of the possessor/experiencer of Δt by an identity mapping of P_i into itself, why should we not treat the receiver in (56)*g-i* the same way, as an identity mapping of P_j?

The crucial thing to note here is that these phenomena are restricted in their occurrence; datives like these are found **only** with predicates (like *give* and *contribute*) defined with respect to the Transfer frame, rather than the CTF itself. If we attempt to recast these sentences in TIM(CTF) using a strict CTF verb like *spend*, however, a different pattern emerges:

(56′)*g* She generously spent her time on the charity project.
h Could you spend a few minutes with me?
i I can spend an hour with you at 9 tomorrow.

(56′)*g-i* show no datives, and no Path. The NPs appearing as datives in (56)*g-i* show up here as VP elements (the image under TIM(CTF) of the X element). What this suggests is that the existence of the datives and their Paths in (56)*g-i* has reference not to the CTF proper but rather to the Transfer frame. It is thus not a part of the TIM(CTF) mapping.

Any resource, including *money* and (as we have just seen) *time*, that can be construed as alienably Possessed can be Transferred outside of a Commercial Transaction, without the presumptions of reciprocal transfer that define that frame. This is shown by the fact that these Transfer frame predicates can occur with practically any direct object — in addition to *a few minutes*, one can *give a look, a lecture, a hug, a push*, or *an idea* to anybody else. The Path phenomenon in (56)*g-i* is thus neither a part nor a result of the TIM itself, but rather of an independent and far more general extension of the concepts of Possession and Transfer, hence the predicates HAVE and GIVE. While this extension may be describable in terms of metaphor themes and frame mappings, we will not attempt it here, merely noting that this case is not one that falls properly under the mapping we are constructing, but rather, as its lexical limitations show, has to do with the Transfer frame exclusively.

Interestingly, the use of HAVE to label the result link between P_i and VP, after the continuous frame transition has occured, is warranted by a seemingly unrelated fact about English syntax: the use of the auxiliary verb *have* to mark the perfect tense (or aspect). While it is still a matter of some controversy whether *have* in this construction may be considered a verb at all, let alone whether it is to be considered related to the possession sense of *have*, there is considerable evidence (brought convincingly to bear in McCawley (1971, To Appear)) to the effect that this is in fact the case.

have in this usage is not restricted to the types of predicates we are interested in here (those subcategorized for human Experiencer or Agent), but it can certainly occur with them. This is sufficient, since the CTF does not derive its element subcategorizations from the selectional restrictions of its linking predicates (WANT and HAVE), but rather from explicit meaning postulates. McCawley treats the perfect *have* as, essentially, the non-finite allomorph of the past tense morpheme, and when it occurs in sentences like (57), it would automatically convey the sense of the subject's experience of the predicate event or state being complete.

(57) *a* He *has* worked for an hour.
b I *have* slept for eight hours.
c We *have* been driving for three hours.

Since these are precisely the roles we have envisioned for P_i with regard to Δt and VP, the image of HAVE under the TIM mapping is an identity transformation — assuming, of course, there is only one very general concept of Possession, which includes the Perfect use of *have*. However, even without making such an assumption, these particular transformations pose no more serious difficulties than any others associated with the concept of possession or the verb *have*, and work as predicted by existing theories concerning them.

WANT is another story. In Section I we established WANT as the logical expression of a predicate of general volition, usually but not always instantiated in English by the lexical item *want*. Yet the TIM mapping often refers to durative experiences which are anything but desirable, in contexts that make it clear they are not in fact wanted. For instance:

(58) *a* I spent an hour sitting in traffic.
b He spends all his time coping with the bureaucracy.

There would seem to be little volition possible in the experience of duration — time flies, willy-nilly. At best, there is some involved in the choices one may make among various experiences, but this is clearly not a necessary part of the TIM theme. We will have to find some substitute for WANT in labelling the link between P_i and VP.

A better understanding of the nature of this link may be found by looking at some semantic aspects of *want*. It is not, for instance, temporally neutral. The time reference of any complement clause of *want* (recall we are adopting here McCawley's (1977) analysis of the construction *want* + NP as *want to have* + NP, which provides a complement clause in every case) cannot be temporally prior to, and is only rarely simultaneous with the time reference of the matrix verb — and then normally only in the negative. It is generally a time later than the matrix verb reference, relatively future to it; *want* is often said to govern the irrealis mode for this reason.

(59) *a* *I want to go yesterday.
b ??I want to be here right now.
c I don't want to be here right now.
d Tom wants to marry a mermaid.

(59)*a* is of course impossible, and the distinction between *b* and *c* is familiar from Section I above. Since there are no mermaids, (59)*d* raises the interesting question of whether there can realistically be said to be any future time reference for the complement clause *Tom marry a mermaid* with respect to its matrix clause *Tom want S*. At the least, however, there is no past or present reference, and that will do for both irrealis and the more conventional future.

This association of *want* and the future is no mere coincidence of English, nor is it purely semantic. Historically, there is a close relation between the verbs *will* and *want*; in German, for instance, the modal auxiliary *wollen* (3rd person singular *will*), a cognate of English *will*, expresses the sense of the English verb *want*, as does the cognate Latin verb *volere* (the source of our word *volition* itself). *will* as a noun in English refers not to anything future per se, but to desire, as did the more archaic non-modal verb *will* of *God wills it* and its modern participial adjective *willing*. There is even one common modern use of the modal *will*, with negatives and in *if*-clauses, that refers to volition rather than future:

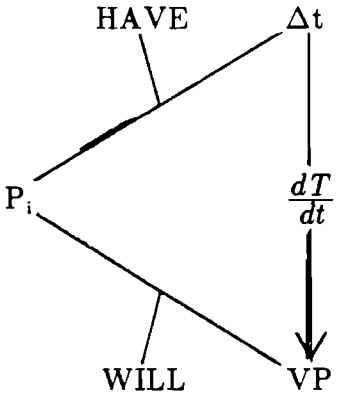
(60) *a* If it rains, try again tomorrow.
b *If it will rain, try again tomorrow.
c If they come, I'll see them.
d If they will come, I'll see them.
e He won't do his homework.

In (60)*a*, *rain* is semantically future, but an *if*-clause does not allow the normal future use of *will*, as *b* shows, hence it appears in the ordinary present tense with future reference; *c* is a case parallel to *a*. In (60)*d*, on the other hand, the use of *will*, which cannot be future, refers to their willingness to come, an interpretation barred in *b* because of the lack of an Experiencer to attribute the willingness to. Finally, *e* is ambiguous between a prediction that he will not do his homework (future *will*) and a report that he refuses to do it (volitional *will*).

If we use the non-volitional predicate underlying future *will* (call it WILL) to identify the link between P_i and VP in the TIM mapping (i.e, TIM(WANT), the TIM image of the WANT predicate of the CTF), we could pin down the appropriate temporal reference by noting, essentially, that as the degree to which P_i *has* Δt decreases, so does the degree to which P_i *will have* VP, and that the degree to which P_i *has* VP increases by the same amount. This is equivalent to building in a continous rate of change from future to past (or irrealis to perfect), which is what perceiving duration is all about, and can be formalized in straightforward mathematical terms if necessary.

(61), then, will serve as the final version of the TIM mapping of the CTF:

(61)



(P_j omitted)

(a) TIM(P_i) = P_i. (An identity transformation)
(b) TIM(\$) = Δt. (Money maps to Perceived Duration)
(c) TIM(X) = VP. (Commodity maps to Durative Perception Verb Phrase)
(d) TIM(HAVE) = HAVE. (Another identity transformation)
(e) TIM(WANT) = WILL. (*want* maps to future *will*)
(f) There is no image of P_j under the TIM mapping.

There are some important points to consider here. First, TIM(CTF) is only a partial mapping; there is no analog of P_j, nor of the links connecting P_j to other elements. Hence much of the symmetry of the CTF is lost, and so are the frame functions like PATH that are defined with respect to P_j. We would predict that any lexical items defined with respect to the CTF or the Barter frame that make crucial reference to P_j or any of its relations or functions would either not be available under the TIM metaphor mapping, or would require additional specifications; as noted, this is not strictly true of Transfer frame items, because of the generality of that frame.

Second, whereas the CTF is defined by a discontinuous temporal transition from one frame to its successor at some instant t_0, TIM(CTF) introduces (and in fact defines) a continuous transition $\frac{dT}{dt}$ from an initial frame at t_1 to a final frame at t_n. One may then speak of the frame values at any instant t_i, and of a continuous (and arguably linear) differentiable frame function $T(i)$ with domain $[1 \leq i \leq n]$, and range the closed set of frame values between t_1 and t_n. The formal resources of mathematical analysis are available for more precise definitions.

Third, the Sponsor and Erase relations developed for the CTF have valid images under the mapping TIM(CTF), mutatis mutandis. A WILL-link in the initial frame (t_1) sponsors a HAVE-link in the final frame (t_n), but there is also now a provision for degrees of possession corresponding to the continuous nature of the frame transition. That is, at the beginning, one *will have* done or experienced the relevant VP, and at the end, one *has*, but there are intermediate degrees possible in between. Erasure is similar: a HAVE-link in the final frame erases a HAVE-link in the initial frame, and this is also a continuous process. If you *have* done or experienced VP already, you no longer *have* the time Δt that that took you.

Finally, whereas the X element in the CTF may be an alienable object, it can also be a VP. When it is represented by a NP, the relation between it and P_i is WANT(P_i, HAVE(P_i, X), d), which we have abbreviated WANT(P_i, X, d), since the HAVE predicate is predictable in this case. However, when some other predicate is specified instead of HAVE, for example *ride the merry-go-round* in *I want to ride the merry-go-round*, that predicate replaces HAVE in the formula, so that the relation in this case would be WANT(I, RIDE(I, merry-go-round), d). This relatively minor semantic detail becomes quite important in TIM(CTF), since the element VP (= TIM(X)) must be a durative predicate with a human experiencer (or agent). Happily, the details of this predicative relation fall out in the mapping precisely as they should, with very little needing to be specified by the mapping itself.

Given these details and limitations of the TIM mapping, it is predictable that, of the idioms and collocations defined with respect to the CTF that instantiate the TIME IS MONEY theme, none should allow reference to P_j, since that element has no TIM image. This is in fact the case.

As we saw in Section III, the major difference between the verbs *spend* and *pay* is that *pay* can occur in construction with all four elements of the CTF: P_j, P_i, \$, and X. *spend* on the contrary, cannot occur in construction with P_j, although it can with the other three elements. Since it is precisely these three elements of the CTF that have images under the TIM, *spend* is a good example of a lexical item that should have a well-formed definition under the mapping, and *pay* is an example of one that should not be definable. As we have seen, *spend* is quite common in TIM expressions, but *pay* does not occur in these contexts, even though its P_j reference is not obligatory.

(62) *a* *He paid three hours to walk/(in) walking home.
b *A lot of time has been paid on/for this project.
c *He pays his time in/on idle pleasures.
d *He says he wants to pay more time with/on his family.

All of the sentences in (62) are unexceptionable with *spend*, but not with *pay*. The problem is not due to choice of complementizer, as (62)*a* demonstrates, nor of complementary preposition, as the others show; nor on the presence of an impossible P_j image in the sentence, since none of these refer to such a thing; there are no datives at all. The problem is plainly and simply that *pay* is defined with specific reference to P_j, while *spend* isn't, even though it is defined with reference to the CTF, of which P_j is an element. This suggests that there are several relevant levels of what Fillmore (1977) calls "perspective" involved here.

There is, first of all, the more or less centrally concerned "viewpoint character" in the CTF, the individual (P_i or P_j) from whose point of view the action is described. For *buy*, it is P_i, for *sell*, P_j; this seems to be what is meant by the term "perspective" in Fillmore (1977). There is, however, a second level of "perspective" for any predicate like *pay* or *spend*; this includes any element of the CTF which occurs in the collocational array (case frame definition) of the predicate. In this case, we may say that P_i is in primary perspective for both *spend* and *pay*, while P_j is in secondary perspective for *pay* but is totally out of perspective for *spend*. It may be that we will have to recognize still other levels of perspective in these contexts.

It is possible to use the verb *buy* with duration expressions. *buying time* as in (63) is quite a familiar idiom, and this would seem to contradict the prediction above that only predicates that have P_j totally out of perspective (like *spend*) should have images under the TIM mapping.

(63) We're just buying time.

It is apparent, however, that the role of the temporal expression in (63) is quite different from its role in the unacceptable (62)*a-d* with *pay*. *time* in (63) is the direct object of *buy*, the analog of X in the CTF, rather than $, which is what it would be in the TIM. The idiom *buy time* seems to have nothing to do with the TIM itself, but rather represents a different mapping, in which the image of the CTF $ element is not time (Δt) as in the TIM, but rather some other thing, perhaps a providential action on the part of P_i, which is "exchanged" metaphorically for an extension of a deadline. It is interesting to note that this particular mapping appears to reverse the TIM images of the $ and X elements — the image here of $ may be a verb phrase, while that of X is time — though it is not clear that the variety of time involved is the same as that in the TIM, nor that the $ image need be a VP. In any event, this is no counterexample, since it is not an example of the TIM at all.

Another prediction is that none of the phrases, idioms, and collocations from the CTF that have to do with **rate** of transfer will be licensed by TIM. For instance, in (64)*a*, the phrase *like a drunken sailor* is an adverbial idiom collocated with *spend* that means roughly the same as *rapidly and in large amounts*, as seen in its equivalence to (65)*a*. The source of this idiom is not relevant here, except to note that it is independent of the CTF itself. The putative TIM transform of this sentence in (64)*b* does not preserve the idiomatic sense of the original. (64)*b* can have only the literal interpretation in which *he* is described as spending his time as a drunken sailor would spend it, i.e., carousing, and certainly does not mean the same thing as (65)*b*, which is unacceptable in any case. By way of comparison, (66)*a* shows a different idiom, which does not necessarily imply a time rate of spending, and as (66)*b-d* show, there is a fairly good fit of the idiom under TIM; where it might be felt to indicate a rate ((66)*e*), the idiom does not map.

(64) *a* He spends his money like a drunken sailor.
b He spends his time like a drunken sailor.

(65) *a* He spends his money rapidly and in large amounts. ($\equiv$ (64)*a*)
b *He spends his time rapidly and in large amounts. ($\not\equiv$ (64)*b*)

(66) *a* He spends time like a miser on this.
b He spends time very carefully and unwillingly on this.
c He spends time as a miser would spend it on this.
d He spends time in small amounts on this.
e *He spends time slowly on this.

This is because the reference to time rate by the idiom is meaningless when applied with respect to time itself; there can be no variations in the passage of time, hence no descriptive terms are required to distinguish them, and this idiom, in common with other CTF collocations that refer to rate of transfer, does not have an image under the TIM mapping, even though the lexical verb used (*spend*) has an image potentially available, and even though other, similar, adverbial idioms with *spend* do have images. This example demonstrates that the TIM mapping does not merely range over a set of lexical items, but rather must have reference to the entire frame, with all its connotational impedimenta. We should, in fact, expect nothing less from so potent and convoluted a phenomenon as metaphor.

Some of the other CTF verbs (or verbs defined with respect to frames prior to the CTF which are inherited by it, like Transfer or Barter) that occur with temporal expressions are: *save, budget, lose*, and *waste*. In addition, there is the use of *have* licensed by the TIM transform itself and the corresponding uses of *give, donate, lend*, and *contribute* that transform straightforwardly under the TIM. All of these confirm the predictions made above: they neither make reference to rate nor allow P_j in perspective — we have already discussed the apparent exception to this with the Transfer frame predicates.

(67) *a* He saved $100 on that car.
b He budgets his money very carefully.
c He lost a lot of money on that car.
d Don't waste your money on that car.
e He certainly seems to have a lot of money to spend on this.
f She generously gave of her money for/*to charity.

(68) *a* He saved 5 hours on that job.
b He budgets his time very carefully.
c He lost a lot of time on that job.
d Don't waste your time on that job.
e He certainly seems to have a lot of time to spend on this.
f She generously gave of her time for/*to charity.

Note that even the very specific construction *give of NP (for/*to NP)* in (67)*f* transforms over as (68)*f* with its syntactic peculiarities intact.

A special case is the verb *make*. There is an idiomatic use of *make* with *money* or some measure phrase denoting money as a direct object whose basic sense is that of coming to have money as a result of some volitional action, (e.g, by work or investment), though not by accidental means such as inheritance. Only this basic sense (as in (69)) has a TIM image. The generic use of *make money* in (70)*a*, which refers to a time rate, predictably does not map, as (70)*b* shows.

(69) *a* If I don't have enough money, I make/earn more money.
b If I don't have enough time, I make/*earn more time.

(70) *a* How much money does she make/earn a year?
b *How much time does she make/earn a year?

Of course, the methods used for *making time* are to be understood as quite different from those used for *making money*. There are serious differences between $ and Δt. For one thing, while there is considerable variation in the amounts of money individuals have and receive, there is none in time; there are 24 hours per day for everyone. *making time*, then, must be understood in terms of an analog of budgeting existing resources, rather than earning more. It is instructive that the verb *earn* itself, ordinarily synonymous with *make* in this context, does not have a TIM image, as shown by (69)-(70), while *budget*, as seen above in (68), does. In fact, most people's experience of *money* is that it, too, is a limited and therefore budgetable resource. Thus it is quite natural to think of it, like *time*, in ways analogous to the sense of *make room*, which also means to reallocate existing resources.

VI. Conclusions and Hypotheses

What light does this study throw on the claims of Lakoff and Johnson (1980)? What conclusions can we reasonably draw about the validity and/or usefulness of the Frame Mapping approach to the analysis of metaphor?

To begin with, this study of Time and Money has shown clearly that the approach encouraged by L&J can be extended considerably and in detail in a number of directions. The concept of **Metaphor Themes** like "TIME IS MONEY" is clearly productive, and this concept, as suggested in Lawler (1983), is one of the principal contributions of L&J's work. Their argumentation is based solidly on the claim that such ultra-high-level semantic abstractions as these themes have both empirical reality (hence, they cannot be ignored), and explanatory power (hence, they should be employed) for linguistic theory, and this claim is strongly supported by the study.

Secondly, the concept of **Local Case** used here (and suggested by Fillmore's (1977) analysis) has been shown to be quite useful in describing and explaining a particular frame; indeed, Local Case is dependent on some concept of frame or semantic field for its very Locality. Since one of the principal criticisms of traditional Case Grammar (cf. Fillmore 1968) has been its practical lack of independently motivated constraints on the multiplication of Universal Cases, this approach suggests that it is quite possible to use Case Grammar's considerable capacity for semantic insight in a motivated way, without being sliced by Occam's Razor.

Third, we have demonstrated in a number of cases and a number of ways that the structural semantic considerations cast here in the form of frames are crucially useful in explaining both grammatical and lexical phenomena. This is, of course, no more than a new variety of an oft-encountered argument; it has been increasingly obvious for at least the last two decades, in and out of linguistics, that grammar and semantics are inextricably linked, and that one formalizes either independently of the other only at the cost of explanatory sterility for both.

Finally, before we become too sanguine, we have also seen that taking account of metaphor themes in linguistics is not a simple matter. In order to say anything consequential about the TIM theme, for instance, it was necessary first to establish a fairly detailed structural and semantic basis for the Commercial Transaction Frame, and then to develop a heuristic theory of Frame Mapping from that frame to another to accomodate the concept of metaphor theme. Many, if not most, of the ramifications of these frames and this theory have not been pursued thoroughly here, though this seems like a reasonable venue for further research and application; nor does one test of a theory give enough information to allow definitive statements about it. By its nature, Frame Mapping is applicable only in situations where it is possible to work out in acceptable detail enough of the fine structure of a frame to construct a testable image frame under the mapping, and this will not always be the case.

In sum: Lakoff and Johnson are substantially correct, but where do we go from there? Aside from the obvious facts that there are many other metaphor themes that could be investigated in this way, and many more languages than English to examine, there are a number of hypotheses arising from this study that deserve further attention. First, I have not attempted to provide an exhaustive account of all lexical items defined with respect to the Transfer, Barter, or Commercial Transaction frames. Such a study could be valuable and is certainly possible along the lines given here; we need to know more about how such lexical fields are structured.

Second, there are many subframes and associated scripts of the CTF which require further explication. For instance, there is the matter of Credit: *borrow, loan, lend*, and *owe* are lexical items to which the CTF has some relevance, and it is not difficult to see how the simultaneity constraint could be revised to allow one Participant to gain possession of a Commodity before the other does, with added provisos of mutual obligation and potential reversion to the original states of possession. Similar remarks apply to *rent* and *hire*, and then there is the matter of transactional malpractice: *steal, rob, rip off*, etc. All are definable with respect to the concepts of possession, transfer, and trade discussed in this study. In fact, much of commerce can be viewed as a multiply-connected network of CTF's with many participants playing various roles in numerous transactions; the net result resembles a simple economic model, and may form a basis for analysis of the relevant technical sublanguages.

Third, the TIM theme is surely not the only one in which the frames discussed here participate, and more research on them is needed to clarify the matter further. For instance, there are the suspicious idiomatic uses of *pay* and *buy* in (71):

(71) *a* I haven't been paying attention to that.
b You'll pay for this, mark my words!
c I don't buy his arguments.

in which the concept of *time* plays no discernible role. Whether these usages are instantiations of a metaphor theme or themes, and what their nature might be if so are open questions, as is the very intriguing possibility of systematic and exploitable relations among various themes relating to money or the CTF, along the same lines as those mentioned in L&J among vertical orientational themes like HAPPY IS UP ("She's down in the dumps."), INCREASE IS UP ("She got a raise."), GOOD IS UP ("She has very high standards."), etc.

Among those possibilities is that of mapping actual economic relationships through these metaphor themes. An example is Gresham's Law, whose most popular formulation states that "Bad money drives good money out of circulation." Given a choice, that is, between two monetary systems (say gold specie versus bank notes, or hard versus soft currencies), if there is a difference between the actual values and the official values of the two, one will naturally prefer to pay in the actually less-valued and be paid with the more-valued. If the official values are enforced in enough transactions, the more-valued form of money will come not be used as money in the mainstream of commerce, since no one will be obliged to pay with it, but will tend to be hoarded for speculation or transactions outside the official market.

Under the TIM, Gresham's Law has a straightforward image. Simply put, in a sufficiently regulated society, less-valued ways of spending time will come to take precedence over more-valued ones. One can discern the operation of this principle, for instance, in the gradual replacement of **quality** as a standard for the evaluation of industrial, entertainment, political, or even academic performance, with the less-valued but much more easily determined and enforced standard of **quantity**.

I can think of no better way to demonstrate the power of metaphor, and of this approach to metaphor, than by showing how, quite unexpectedly, this rather abstract analysis of what might appear to be merely a figure of speech could produce a hypothesis with the trenchant political and social implications of the one in the paragraph above.

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