The effect of context on the processing of type-shifting verbs[☆]

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Abstract

Recent research in lexical semantics has suggested that verbs such as *begin* and *enjoy* semantically select for a complement that denotes an activity or an event. When no such activity or event is specified in the form of a progressive or infinitival complement, as in *John began (to read/reading) the book*, the verb is said to "coerce" the NP direct object to shift its role to encompass the activity that *begin* requires as complement (e.g., *writing*, *reading*). Empirical support for this view has been provided by McElree, Traxler, Pickering, Seely, & Jackendoff (2001). In the present study, however, in two self-paced reading experiments, type-shifting effects (taken to be longer reading times engendered by the computation of the coercion process) were not obtained with sentences in isolation (Experiment 1) or with sentences embedded in contexts that specified the nature of the activity performed over the complement NP (Experiment 2). It is argued that type-shifting verbs are similar to non-preferred verbs for given contexts and that type-shifting operations are pragmatic inferences computed over underspecified semantic representations.
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1. Introduction

It is well known that the process of sentence comprehension involves at least two types of computations—syntactic parsing and semantic or conceptual interpretation. Although it is not clear whether or not these processes occur independently, it is clear that the interpretation of the meaning of a sentence is at a minimum a function of the meaning of its constituent parts. In (1), for instance, the event denoted by the sentence can only be understood once the meanings of the constituent items are interpreted as a function of their position in the syntactic structure of the sentence, thus ruling out, for instance, the interpretation of the string *the cat died* as a syntactic constituent.

(1) The dog that chased the cat died.

This is what allows for sentence (1) to be interpreted as referring to a dog that died, with the specification that one of the properties of the referring deceased dog is that of having chased a cat at least once.

This form of classical Fregean compositionality—in which the meaning of a whole expression is a *function* of the meaning of its constituent parts—can be challenged by cases in which the interpretation of phrases and their constituent lexical items does not seem to allow for the referring event to be determined solely by its linguistic constituents. One such case is that of type-shifting constructions. As discussed in Pustejovsky (1995), there are cases in which verbs require their arguments—in particular nominal phrase complements (henceforth NPs)—to be of a certain semantic type (quantifier, entity, proposition or activity, etc.). When the NP does not conform to the verb's requirements, the NP's semantic type is coerced to change (or "type-shift") from one type to another (say, from an entity to an event). Through this paper I will refer to such verbs as "type-shifting." Thus, for instance, with verbs such as *begin* in (2), which

requires an event complement, the semantic type of the NP complement *the book* (an entity) is required to change to that of a proposition denoting an activity performed with the book (see Jackendoff, 1997; Pustejovsky, 1995).

(2) The author began the book.

The key to understanding how NPs are interpreted in sentence contexts, therefore, is in the specification of the types of arguments a verb takes, and the types of events a verb denotes. Moreover, the nature of the representation of NPs and their realization in terms of semantic types (Partee, 1987) is crucial for the specification of the compositional properties of complex linguistic tokens.

In recent years, the nature of the representation of verbs, in particular, has taken center stage in the dispute between theories bearing on the nature of the representation of lexical concepts (see Fodor, 1998; Jackendoff, 1990). There are two main proposals regarding the nature of the semantic representation of verbs: one assumes that verbs (and in particular monomorphemic verbs) are represented in terms of decompositional features or templates (e.g., Jackendoff, 1990, 1997; Pustejovsky, 1995; Rappaport Hovav & Levin, 1998), and the other assumes that lexical items are mapped onto atomic, indivisible concepts (de Almeida, 1999a, 1999b; Fodor, 1998). According to the atomic view, lexical concepts (i.e., concepts labeled by monomorphemic items) are denotational and abstract, metalinguistic translations of token items.

The decompositional view, more specifically, assumes that verbs are conceptually represented by complex structures that identify the nature of a verb's referring events together with a specification of the nature and types of their arguments and the roles they play in the events. To mention a classical example from the Generative Semantics era (see Lakoff, 1976; McCawley, 1972), the conceptual decomposition view of lexical concepts assumes that a verb such as *kill* in (3a), is represented as in (3b) where the surface verb's subject and object arguments are taken to assume the roles of agents in the causative and in the resultative events, respectively, in the "deep" conceptual analysis of (3b). The analysis of (3a) as in (3b) follows from the semantic template of *kill*, such as in (3c), which is taken to be its lexical-conceptual or lexical-semantic representation.

(3a) Mary killed the dog.

(3b) [Mary$_x$ CAUSE [the dog$_y$ DIE]]

(3c) [x CAUSE [y DIE]]

This view finds theoretical support in contemporary works such as those of Rappaport Hovav and Levin (1998) and Jackendoff (1990). In contrast, for the atomic theory, any conceptual relation between one concept and another can be obtained via inferential relations. For instance, the relation between *KILL* and *DIE* can be obtained via a rule of inference (or a meaning postulate) that says, *if x kills y, y dies* (de Almeida, 1999a). In that regard, the atomic theory assumes that there is no *dependency* between concepts: possession of the concept *KILL* does not *necessarily* imply the possession of other concepts such as *DIE*, just as the possession of the concept *DOG* does not imply the possession of the concept *FURRY*. For the decompositional theory, however, concepts are the very elements which enter into the definitional templates and, thus, possession of a conceptual template implies the possession of its constitutive concepts (see Fodor, 1998).

Decompositional analyses such as that of *kill* in (3c) are not exclusive to verbs. In the last four decades or so of semantic or conceptual analysis, there have been many proposals for the decomposition of concepts labeled by nouns—spanning linguistic definitional theories such as that of Katz and Fodor (1964) to current views of lexical-semantic representations such as Pustejovsky's (1995) view of nominals as *qualia structures* (see below).

This paper investigates a particular case of lexical decomposition of NPs in the context of their interaction with verbs requiring specific types of NP complements. In particular, the study reported below further investigates experimentally a claim for the semantic decomposition of NPs in contexts whereby verbs "coerce" their complements to change types. The present investigation follows from a recent study by McElree, Traxler, Pickering, Seely, and Jackendoff (2001; see also Traxler, Pickering, & McElree, 2002) providing psycholinguistic evidence for type-shifting operations and supporting the view that lexical coercion occurs during online sentence interpretation as a function of lexical-semantic decompositional properties of NPs. I will now review these issues and report two experiments—one a quasi-replication of McElree et al.'s study and another a study that investigates the effect of contextual information on the computation of type-shifting operations. I will conclude by proposing an alternative analysis for type-shifting operations—one that does not rely on the decomposition of NPs, thus arguing against Pustejovsky's theoretical view and its empirical support provided by McElree et al.'s study.

2. Compositionality, lexical decomposition, and type-shifting operations

I started off by discussing a classical type of compositionality as if it were the canonical case of semantic interpretation. However, there are clearly many types of linguistic constructions that cast doubt on this view—including opaque compounds (Libben, 1998), idioms (e.g., Pitt & Katz, 2000), implicit arguments (e.g., Mauner & Koenig, 1999; Rice, 1988) and the aforementioned case of type-shifting constructions to cite a few. Regarding the latter case, as observed by Pustejovsky (1995) and by Jackendoff (1997), it appears that verbs such as *begin* and *enjoy* semantically select for a complement that

expresses an activity or an event such as in (4a) where the complement of the main verb is an infinitival or gerundial (henceforth, V + NP) phrase. When these verbs appear with only an NP complement as in (4b), they are taken to coerce the NP complement into changing its type from an entity to an event or proposition denoting an activity over NP, such as in (4c).

(4a) The secretary began to type/typing the memo.

(4b) The secretary began the memo.

(4c) [The secretary began [[writing/typing/reading] the memo]].

The specifics of the nature of the objects that are semantically selected by a verb or other categories are detailed in Pustejovsky's (1995) work, and it is beyond the scope of the present paper to provide a thorough review of the proposed theory. Suffice to say that Pustejovsky assumes that nouns are represented in the lexicon as qualia structures. These structures encode the "set of properties or events associated with a lexical item which best explains what that word means" (Pustejovsky, 1995, p. 77). Qualia structures are composed of four different roles that specify the meaning of a word (Pustejovsky, 1995, p. 76): the "constitutive" role ("the relation between an object and its constituent parts"), the "formal" role ("that which distinguishes it within a larger domain"), the "telic" role ("its purpose and function"), and the "agentive" role ("factors involved in its origin or 'bringing it about'"). Of particular relevance in the present context is the nature of the "telic role" or the specification of the "purpose and function" of the referent of the item. As an example of purpose and function for the noun *food*, Pustejovsky suggests "eating." In this respect, the nouns *novel* and *dictionary*, for instance, have different telic roles, whereby one is "reading," the other is "consulting."

Regarding constructions involving type-shifting verbs, Pustejovsky proposes that in the absence of an explicit activity or event in the sentence (such as in the case of (4c) above), the verb selects a telic role of its direct object, that is, the verb selects a purpose or function of the object.

From a language-processing perspective, this view leads us to assume that a reader or listener of (4a) would type shift the NP complement and represent it as an activity such as one of those specified in (4c). We can assume that, based on what Jackendoff and Pustejovsky pondered, such coercion operation is obligatory given the underspecified nature of type-shifting verbs (see also McElree, Traxler, Pickering, Seely, & Jackendoff, 2001). This is because the lack of specification of an activity within the VP should force the verb to select an activity among those specified *with the lexical entry for the noun*, that is, among what Pustejovsky calls the telic roles for the noun referent. Since, as Pustejovsky claims, it is *part of the lexical entry* for *book* that books serve for reading, the interpretation of *began the book* as *began reading the*

book is the product of a mandatory coercion process. The assumption, then, is that a type-shifting operation requires an extra process in the online interpretation of the sentence. This is because selecting a telic role among the possible roles represented with the noun lexical entry, and coercing it to change semantic types relies on a computational operation that is not required when the activity is specified within the VP. Notice that interpreting *the memo* in contexts such as (4a) should not trigger the operation, therefore, no further lexical operations such as type-shifting should be required. This view, in summary, assumes that understanding sentences with verbs such as *begin* or *enjoy* with an NP complement implies recovering the activity performed over the NP from the types of activities the referent NP serves for. If the sentence refers to a specific activity such as writing, for instance, then *The secretary began typing the memo* can be understood by taking into account what Jackendoff (1997) calls "simple composition." In this context, "simple composition" refers to the classical compositionality maxim which states that the meaning of the whole sentence is a function of the meaning of its constitutive parts. Thus, assuming that the process of language comprehension involves recovering the meaning of linguistic utterances, then the meaning of *The secretary began typing the memo* can be determined directly by the meaning of its words and phrases as a function of their syntactic positions and roles. In this case, since *begin* requires the specification of an activity, then *typing the memo* becomes its complement argument and the interpretation of the nature of the activity expressed by the sentence can be achieved. By contrast, when type-shifting verbs occur with a complement that does not directly denote either an activity or an event (such as in *began the memo* or *enjoyed the book*) the NP complement must be type-shifted from an object to an activity to conform to the verb's semantic restrictions. When this happens, the reader or listener relies on what is called "enriched composition" (Jackendoff, 1997), as opposed to "simple composition." The reader or listener needs to access the noun's lexical conceptual representation and select a telic role amongst the ones stored with the item. Thus, *The secretary began the memo* may be interpreted as *The secretary began typing the memo* or *The secretary began reading the memo*—or any activity that falls within the range of activities that the verb semantically selects.

Pustejovsky's position on the representation of nouns as qualia structures has been criticized recently by Fodor and Lepore (1998), who claim that one of the main problems of Pustejovsky's theory is that it does not distinguish between what is lexically specific (what is part of the *grammatical* knowledge that is encoded in the lexicon) and what is world knowledge. In addition, they point out that the specification of purpose and function within the structure of a lexical item leads to many problems such as the multitude of uses of an object, and

the proper characterization of objects that do not have a specific use (*a rock to break a window*). According to Fodor and Lepore, it is not clear why, if an object has a given function *X*, then *to begin X* would have to mean *begin to use X to perform its function*. They mention the example of *car*: *begin a car* does not mean *begin to drive a car*. They assume that expressions of the form *wants X* or *begins X* are interpreted as denoting *begin performing a function with X* only at a later stage in the interpretation of the sentence—a stage in which the listener or reader performs logical computations (or inferences) over the expression *begin X* or *want X* relying on his/her knowledge of the properties of *X* such that telic roles need not be specified in an encyclopedic lexicon. In this way, Fodor and Lepore preserve their view of lexical concepts as being atomic and therefore not having internal structure (Fodor, 1998).

3. Empirical evidence for enriched composition

Thus far, there have been only two empirical studies investigating the psychological reality of the representation of type-shifting verbs and the hypothesis of enriched composition triggered by the coercion of complement NPs (McElree et al., 2001; Traxler, McElree, & Pickering, 2002; but see also Pinango, Zurif, & Jackendoff, 1999, for evidence for other types of coercion processes). In these studies, it has been argued that the interpretation of a sentence containing a type-shifting verb without an explicit activity (*began the book* instead of *began writing/reading/reviewing the book*) requires the reader or listener to recover the NP complement's qualia structure as discussed above. McElree et al. (2001) employed a self-paced reading paradigm with sentences containing three different types of verbs: (a) type-shifting (5a), (b) preferred (based on preference norms on verb-noun complements; 5b), and (c) non-preferred (based on the less frequent response provided by subjects in the preference norms; 5c).

(5a) The secretary began the memo before the annual sales conference.

(5b) The secretary typed the memo before the annual sales conference.

(5c) The secretary read the memo before the annual sales conference.

Of particular interest are the reading times of verbs and their complements. McElree et al. found that, when compared with verbs that are preferred in the same contexts, type-shifting verbs engendered longer reading times at post-verbal regions, thus producing what I will call a "type-shifting effect." They also found that, since non-preferred constructions expressed "less prototypical relationships" than preferred constructions, at a region immediately after the verb (at the noun object), non-preferred verbs yielded longer reading times than pre-ferred verbs. The difference between preferred and non-preferred verb classes, however, disappeared at later regions of the sentence. McElree et al. postulated that the longer reading times for type-shifting constructions were due to additional computational costs associated with semantic interpolation, possibly due to having to select for a telic role within the noun's qualia structure in the process of producing an enriched composition of the semantic structure of the sentence.

Traxler et al.'s (2002) study employed an eye-tracking paradigm in order to measure reading times for the different regions of constructions similar to those used by McElree et al. In their first experiment, they found that results tended to be similar to those obtained by McElree et al., but with only marginally longer reading times obtained in post-verbal regions of type-shifting constructions as opposed to preferred and non-preferred constructions. In their second experiment, entity complement NPs (e.g., *started the puzzle*) were contrasted with event complement NPs (e.g., *started the fight*). One of their assumptions was that when type-shifting verbs are followed by event-denoting NPs they would not trigger the coercion process, given that event complements fit the semantic restrictions of those verbs. They found small differences between the two types of complements, however only in the analyses that reflected later interpretive processes—those corresponding to second-pass reading times (total eye-fixation times at a second scan through the complement NP) and total reading times (including total fixations—during first and second scan paths—in the post-verbal regions).

These results cast doubt on the nature of the so-called coercion process. It is not clear if they are in fact obtained as a function of a mandatory process of type-shifting triggered by the computation of the verb and a complement that does not match the verb's restrictions (as in the case of an event being represented by an entity) resulting in what Jackendoff (1997) called enriched composition (Pustejovsky's *cocomposition*), or if they reflect, as Fodor and Lepore (1998) suggest, a post-access inferential process triggered by the underspecification of the V + NP type-shifting construction.

In summary, it appears that empirical support for coercion processes in type-shifting constructions is not firmly established. Moreover, the nature of the events triggered by the underspecified construction resulting from a type-shifting verb with an NP complement is not clear. It is possible that enriched composition does occur as a result of a process of selection between telic roles within a type-shifting complement NP, however is also possible that effects lending support for enriched composition (as in McElree et al.'s and Traxler et al.'s studies) reflect, in fact, late interpretive inferential processes triggered by underspecified constructions.

The aim of the present study was to investigate the role of contextual information in the coercion process—

i.e., in the process of type shifting of an entity-type NP into a proposition as caused (or coerced) by a type-shifting verb. It is clear that contextual information should play a role in the interpretation of underspecified constructions. As noted by Lascarides and Copestake (1998), if type-shifting operations involve selection of telic roles within lexical entries for nouns, context should determine their nature, beyond what is lexically determined as default roles. For instance, the telic role for *book* (e.g., books are for reading) can be easily overridden by information provided by sentential and discourse contexts. Lascarides and Copperstake assume, for example, that the interpretation of (6a) should be (6b) rather than (6c).

(6a) My goat eats anything. He really enjoyed your book.

(6b) The goat enjoyed eating your book.

(6c) The goat enjoyed reading your book.

By the same token, context may determine whether an NP complement should be interpreted as an activity or as an entity. In this regard, since context may provide the information that is "missing" in the type-shifting construction (e.g., the nature of the activity performed over the NP complement), it may *cancel* the type-shifting operation. This is because the complement entity-NP may be directly interpreted as an activity NP—as was the case with the effect obtained in Traxler et al.'s (2002) Experiment 2 in which event NPs were faster than entity NPs when event NPs were required by the verb. Another possible effect of contextual information is the further narrowing down of the range of events that could be selected within the events that are specified for NP complements. This would follow from Pustejovsky's view that type-shifting verbs select telic roles within nominal lexical structures. Thus, a context that refers to the plan or desire of an author to write a book, for instance, would provide information needed for the reader to interpret a sentence with a VP *began the book* as *began writing the book*. In both cases, the cancellation of type-shifting operations or the narrowing-down of telic roles, context could lead type-shifting constructions to behave as preferred constructions and both would be read faster than non-preferred constructions. It is possible, however, that, if the computation of the type-shifting operation is an obligatory lexical access process—that is, if selecting a telic role in the noun complement's qualia structure is determined by the underspecification of the type-shifting verb and its NP complement—then context would not speed up reading times in post-verbal positions, and type-shifting effects would occur regardless of contextual information. Both results, then, could be accommodated within an "enriched composition" view of the operation of semantic interpretation of type-shifting constructions. One way to distinguish between the two outcomes is to look at the time-course of

events leading to semantic interpretation. In McElree et al.'s (2001) study, non-preferred and type-shifting constructions behave similarly, in the positions immediately after the verb (the determiner and the noun). At later positions, however, type-shifting constructions were found to be slower than both preferred and non-preferred constructions. The enriched composition hypothesis would predict that if type-shifting operations were *cancelled* by contextual information, type-shifting and preferred constructions would behave similarly in all positions immediately following the verb. If, however, context had the effect of narrowing down the range of telic roles (but, nonetheless, allowed for coercion to take place), then differences between non-preferred and type-shifting constructions would be found at later positions, with the interpretation of type-shifting constructions being resolved earlier than in the case of non-preferred constructions—which would still have low probability for the particular sentential context.

Against the view that coercion processes (and the ancillary hypothesis of enriched composition) occur in those constructions is the following set of outcomes: first, no differences should be found between sentence types in the absence of contextual information (Experiment 1). This is because, if the interpretation of type-shifting constructions is an inferential process (instead of a coercion process within lexical entries) beyond the process of computing simple composition, then there should be no differences between interpreting constructions such as *typed the memo*, *read the memo*, or *began the memo*. For all of them, interpretation should be accomplished by denotation over atomic representations (Fodor, 1998; Fodor & Lepore, 1998) followed by inferential interpretive process (including pragmatic inferences). Results such as those of McElree et al. could also be accounted for with this explanation in the event self-paced reading times are in fact sensitive to those pragmatic inferences generated during the process of interpretation *and, beyond that,* the inferences triggered by type-shifting constructions take more resources than those required by other types of constructions. The addition of context (Experiment 2), however, should lead type-shifting verbs to behave as non-preferred verbs, and both types should still produce longer reading times than those of preferred verbs.

In order to distinguish between these outcomes, then, two experiments were conducted. Experiment 1 was a quasi-replication of McElree et al.'s study with slightly different materials and procedures and with sentences in isolation. Experiment 2 employed the same sentences of Experiment 1, however the sentences were preceded by contextual information that provided further information about the nature of the activity performed over the complement NP of the main verb.

4. Experiment 1

This experiment was designed to replicate the effect obtained by McElree et al. (2001) using modified materials. By means of a self-paced moving window paradigm, participants read sentences containing either a type-shifting, a preferred or a non-preferred verb. It was expected that given the similarities between the present materials and those employed by McElree et al. (but see below for modifications in the materials), a similar type-shifting effect would be obtained. This effect would be revealed if reading times for post-verbal positions were longer in type-shifting constructions than in both preferred and non-preferred ones.

4.1. Method

4.1.1. Participants

Sixty-nine native speakers of English from the Concordia University community participated in this experiment. All had normal or corrected to normal (20/20) vision and did not report having any cognitive deficits. They participated as part of a Psychology course requirement or were paid $7 for an experimental session that included other unrelated experiments. All subjects were unaware of the true purpose of the experiment.

4.1.2. Materials and design

Twenty-one sets of sentence triads were prepared. Sentences from each triad differed only in the type of verb used—type-shifting (e.g., *The secretary began the memo long before it was due*), preferred (*The secretary read the memo long before it was due*), and non-preferred (*The secretary wrote the memo long before it was due*; see Appendix A). In order to derive preferred and non-preferred sentences, McElree et al. asked participants to provide fill-in-the-blank responses to frames such as *The author was starting _____ the book*. The verbs selected for the preferred condition were those which occurred most frequently in the frames. The verbs for the non-preferred condition were selected from those that appeared the least number of times in the contexts provided, but that reflected a plausible interpretation of the type-shifting constructions. The sentences used in the present experiment were modified from the set of 33 sentence triads used by McElree et al. While the verb triads that they used were kept constant, most of the modifications in the sentences in the present study were in the agent of the main verb and in post-verbal positions. The modifications in the agent position were made in order to obtain a more semantically congruent relation between the agent (e.g., *the alpinist*) and the object of the verb (e.g., *the mountain*). For instance, a sentence triad such as *The soldier attempted/climbed/scaled the mountain as part of his training* was replaced with *The alpinist attempted/climbed/scaled the mountain after he trained*.

Although it is highly plausible for a soldier to attempt/climb/scale a mountain as part of his training, it is much more plausible—and, by assumption, reads more naturally—if an alpinist does so. Because the agent–verb–complement triad does not require the contextual information provided by the post-VP adverbial phrase, the changes introduced were aimed at isolating effects within the agent-verb-complement triad, rather than assigning the task of providing contextual information to post-verbal adjuncts such as adverbial phrases. In the present study, several materials were modified in a similar manner, in order to decrease the need for post-verbal information to be used in the interpretation of the sentence. Another reason for modifying some of the NP agents was that the specification of their activities was not related to the type of activity they performed in the context of the sentence. Thus, for instance, for a sentence such as *The teenager started/read/wrote the novel...*, the NP agent was replaced with *The student* and the NP complement, *the paper*. For the case of *The builder started/built/demolished the house...* the agent was replaced with *The contractor* in order to avoid any possible morphological priming between the pair *builder built*. A further reason for modifications in the post-NP complement regions was the lack of consistency in the original materials regarding the grammatical category that would constitute the segment after the complement NP. In some instances the original segment had a preposition (as in *The artist began/painted/analyzed the portrait in his studio...* [underlines added]), in others, an adverb (as in *The waitress started/poured/drank the coffee before...*), a conjunction (as in *The pilot mastered/flew/landed the airplane and moved...*), or a determiner (as in *The professor survived/visited/advised the dentist the other day*). For the present materials, only prepositions and adverbs were used in the position after the NP.

The 21 sets of sentence triads were evenly distributed among three lists so that all three types of verbs (type-shifting, preferred, and non-preferred) were equally represente, with only one version of each triad occurring in a given list. In addition to the 21 experimental sentences, each list also contained 27 filler sentences.

4.1.3. Apparatus and procedure

Stimuli were presented to participants on Apple 17 in. CRT monitors attached to Macintosh G3 computers running PsyScope (Cohen, MacWhinney, Flatt, & Provost, 1993). Stimuli were presented in white characters (font Courier New 18) on a black background. Participants were tested individually in dimly lit rooms. They were instructed that sentences would appear on a screen, first in the form of a set of dashes, with each dash corresponding to a letter, and with spaces between dashes corresponding to spaces between words (e.g., "--- ---------" corresponding to, e.g., *The secretary*). With each space bar press, a word or segment of the

sentence would be revealed on the screen and, with each subsequent press, a word or segment would appear and the previous one would revert to dashes. They were also instructed to read the sentences at a normal pace and to pay close attention to the sentences, as sometimes questions relating to the sentences they had read would appear on the screen. There were 11 comprehension questions, six of which were related to experimental sentences and five to filler materials.

The experiment began with the presentation of written instructions on the screen. The experimenter then verbally reinforced the instructions. There were four practice trials, followed by a summary of instructions. The experimenter remained in the testing room during the practice trials in order to ensure that the procedure was clearly understood by the participant. The order of trials was randomized for each participant. The experiment lasted approximately 15 min.

4.2. Results and discussion

Mean reading times (and standard deviations) for all sentence types and sentence positions are presented in Table 1.

Reading times above 1500 ms and below 100 ms were eliminated. These corresponded to 6% of all raw data points. Six participants who had the majority (over 50%) of their data points in all conditions above 1500 ms were eliminated from further analyses. Of the remaining data, reading times 2.5 standard deviations above or below the mean of each verb type in each reading position were replaced by the cutoff point values. This resulted in 11.2% of the cells being replaced with the higher cutoff point values. Given the large standard deviations, no values 2.5 standard deviations below the mean of each condition were replaced. Analyses of variance (ANOVAs) by participants ($F1$) and by items ($F2$) were done for all sentence positions. A general 3 (sentence type: preferred, non-preferred, type-shifting) by 4 (sentence position: verb, NP-complement [e.g., *the memo*; hereafter, V + 1], and two subsequent words, V + 2 and V + 3 [e.g., *long*, *before*, respectively]) ANOVA revealed a significant main effect of position ($F1(3, 186) = 89.5, p < .0001, MSE = 13,035$,

$F2(3, 240) = 124.4, p < .0001, MSE = 2515$). There was no main effect of sentence type, but a significant interaction between sentence type and position in the analysis by participants only, $F1(6, 372) = 3.17, p = .005, MSE = 3137$. Analyses of each of the reading positions yielded a marginally significant difference at the verb position in the analysis by participants, $F1(2, 124) = 2.99, p = .054, MSE = 3620$, but not in the analysis by items, $F2(2, 61) = 1.39, p = .25, MSE = 3169$. In the V + 1 position (the NP complement of the main verb), the difference between sentence types failed to reach significance, $F1(2, 124.) = 2.02, p = .14, MSE = 6188, F2(2, 40) = 0.55, p = .58$. There was a tendency for slower reading times for type-shifting constructions in the V + 1 position, but this tendency was not significant in the comparison between type-shifting and preferred constructions, $F1(1, 62) = 3.36, p = .072, MSE = 6560, F2(1, 20) = 1.10, p = .31$, or in the comparison between type-shifting and non-preferred constructions, $F1(1, 62) = 2.26, p = .14, MSE = 6512, F2(1, 20) = 0.19, p = .67$. At the V + 2 position, no significant differences between the three construction types were found ($F1$ and $F2 < 1$). At the V + 3 position, however, there was a significant difference between the three constructions, $F1(2, 124) = 4.43, p = .014, MSE = 1793, F2(2, 40) = 5.4, p = .008, MSE = 647$. In pairwise comparisons, type-shifting constructions were faster than preferred constructions, $F1(1, 62) = 7.33, p = .009, MSE = 2157, F2(1, 20) = 9.92, p = .005, MSE = 705$, but no other comparisons were significant. It is unclear why type-shifting constructions were faster than preferred ones at this point. What seems to be clear, however, is that faster type-shifting constructions cannot be taken to be an effect of semantic *complexity* of these constructions, given that, by hypothesis, semantically more complex sentences should yield slower reading times.

As we have seen, the type-shifting effect obtained by McElree et al. was not replicated in the present study: It appears that there is no difference in reading times between the three construction types at the critical points where type-shifting effects were predicted (mainly V + 1 and V + 2 positions). The failure to replicate McElree et al.'s results could be due to the different materials and reading time measurements employed in the present experiment. Since McElree et al. claimed that the differences between type-shifting and the other types of constructions should occur in post-verbal regions, it is possible that presenting the full NP complement (determiner and noun) at once, instead of word-by-word, could have masked the different reading times for post-verbal material. Notice that the reading times in the present experiment were slower overall than the ones obtained by McErlree et al. In their study, the largest difference between type-shifting and preferred constructions occurs during the third word after the verb (corresponding to V + 2 in the present experiment), with type-shifting constructions being 24 ms slower than

Table 1
Mean reading times (and standard deviations) for sentence construction types in four sentence positions in Experiment 1

	Sentence position			
	Verb	Verb + 1 *the memo*	Verb + 2 *long*	Verb + 3 *before…*
Non-preferred (*read*)	553 (186)	609 (214)	495 (114)	429 (100)
Preferred (*typed*)	535 (153)	604 (204)	489 (107)	439 (114)
Type-shifting (*began*)	527 (145)	631 (234)	491 (105)	417 (93)

preferred constructions. In the second word after the verb—the noun—they report a 20 ms difference between type-shifting and preferred constructions. In the present experiment, the difference between these two constructions at V + 1 (the NP) was 27 ms (n.s.). In the third word after the verb (V + 2), for which McElree et al. claim type-shifting effects may be stronger, no difference between type-shifting and preferred constructions was found. However, the fact that the reading times were slower than those obtained by McElree et al. would not entirely account for the lack of difference between the three constructions. In the eye-tracking study reported by Traxler et al. (2002, Experiments 1 and 2), type-shifting effects were only marginally significant and even non-significant, in some cases, such as in first-pass reading times. In addition, while McElree et al. claimed type-shifting effects were obtained at later positions (after the complement NP) all Traxler et al.'s effects were obtained at the complement NP region of the sentence.

Another possible reason for the lack of difference between the three construction types may be due to the modified materials. Although the present materials were similar to those of McElree et al. and Traxler et al. (Experiment 1), the agent of the main clause was modified in order to form a more semantically coherent triad with the main verb and the complement NP. It is possible that these modifications could have had an impact on the computation of type-shifting operations, thus leading to smaller, though non-significant differences between type-shifting and other constructions. As previously hypothesized, context (in this case, intra-sentential context) could operate by narrowing down the range of possible telic roles to be selected from during the production of the enriched composition, thus reducing reading times at post-verbal positions. However, it is unclear why, if the coercion process was sped up by the sentential context, no differences between type-shifting and non-preferred constructions were obtained. An alternative explanation is that the three constructions do not engender different semantic processes, that is, that the first-pass analysis of the sentence relies on what Jackendoff called "simple composition," rather than "enriched composition."

In summary, taken together the results of the present study and some of Traxler et al.'s results (Experiments 1 and 2) may suggest that type-shifting verbs are not more complex—or do not engender more complex semantic processing—than other verb types. However, the impact of more discourse information on the semantic processing of those constructions remains to be seen.

5. Experiment 2

As we have seen, Experiment 1 failed to obtain results comparable to McElree et al.'s by not producing the type-shifting effect at the V + 1 position and, as such, does not provide support for the enriched composition view. In the present experiment, the hypothesis that type shifting constructions are taken to be semantically more complex than other constructions is put to the test using a contrast between the three types of constructions from the previous experiment but preceded by contextual information that further constraints the nature of the event performed by the agent over the referring complement NP.

5.1. Method

5.1.1. Participants

Thirty-six native speakers of English from the Concordia University community volunteered to participate. They all had normal or corrected to normal (20/20) vision and did not report having any cognitive deficits. They received $7 for participation or were compensated with course credit.

5.1.2. Materials

The sets of sentences used in this experiment were the same 21 triads used in Experiment 1. In this experiment, however, a paragraph context was created for each sentence triad in order to constrain the range of possible events to be described by the target sentence. For a sentence triad such as *The secretary began/read/typed the memo long before it was due* the context was *The secretary would always be sure to work ahead of schedule. She was asked to work on a memo.* Notice that there was no mention of the specific activity that the secretary had to perform (i.e., no mention of whether she had to type or read the memo), only that she had to work on the referred object NP. As a result, the context allowed for all three verbs—*type*, *read*, and *begin*—to be equally plausible in the sentence. Moreover, the context specified that, for the case of *begin*, the secretary would be beginning the work she had to do on the memo (that is, that she would perform an *activity* with an object NP). To ensure that participants were carefully reading the contexts and the sentences, 11 *yes/no* comprehension questions were presented after some of the trials. Six of the questions referred to material presented in the paragraph, and five referred to information provided in the sentence.

5.1.3. Procedure and apparatus

The procedure and apparatus were the same as those employed in Experiment 1, except that, for each trial, participants were presented with a paragraph before the presentation of the row of dashes corresponding to the sentence. Each trial commenced with the presentation of the paragraph displayed in its entirety in the middle of the screen. After having read the context the participants pressed the space bar on the computer keyboard

and a row of dashes corresponding to the sentence appeared in the middle of the screen for the self-paced reading task. Participants were instructed to pay attention to the paragraphs and the sentences because questions relating these materials would appear randomly. The experiment lasted approximately 20 min.

5.2. Results and discussion

Reading times for all verb types (type-shifting, non-preferred, and preferred) and three post-verbal positions were collected (V + 1, V + 2, and V + 3). Type-shifting effects were taken to be reading time delays as compared to the preferred condition and the delays over and above the non-preferred condition at different post-verbal points. Of particular interest, therefore, are reading times for the V + 1, V + 2, and V + 3 sentence positions—which were the same as in Experiment 1. Thus, in a sentence such as *The secretary began the memo long before it was due*, the segments of interest would be the verb (*began*), the V + 1 segment which is the NP complement (*the memo*), and the V + 2 and V + 3 segments (*long* and *before*, respectively).

For the statistical analyses, reading times that were below 100 ms or above 1500 ms were deleted from the data set, since they could reflect either anticipations or strategic effects on the part of the reader. There was only one value below 100 ms and 19 values that were above 1500 ms, which represent only 0.61% of the total raw data. In order to eliminate extreme values, reading time scores that were above or below 2.5 standard deviations from the means for each verb type in each sentence position were replaced with the cutoff point values. There were no data points below 2.5 standard deviations from the mean, however, 46 data points were above 2.5 standard deviations. This accounted for 0.015% of the total data that was replaced with the corresponding cutoff point value. The means and standard deviations for each condition are presented in Table 2.

A 3 (verb type: type-shifting, preferred, non-preferred) by 4 (position: verb, V+1, V+2, V+3) ANOVA revealed a significant effect of verb, $F1(2,70) = 3.89$, $p = .025$, $MSE = 3490$, and sentence position, $F1(3,105) = 26.4$, $p < .0001$, $MSE = 4458$, and a marginally significant interaction between the two conditions, $F1(6,210) = 2.13$, $p = .0511$, $MSE = 1704$. In the items'
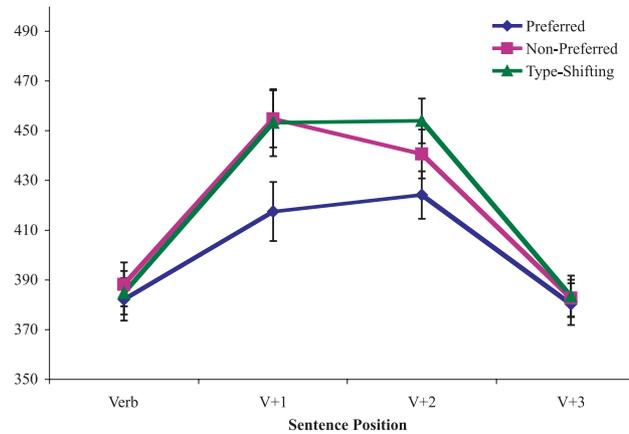

Fig. 1. Mean reading times for the three construction types as a function of sentence position.

analyses, only sentence position turned out significant, $F2(3,246) = 14.14$, $p < .0001$, $MSE = 7751$. Of particular interest were the differences between the various verb levels at the V+1 (the NP) and V+2 (the preposition or adverb) sentence positions. Taking account data from these two positions, there was a significant difference of verb type, in the subjects' analysis, $F1(2,70) = 5.94$, $p = .004$, and a marginally significant difference in the items' analysis, $F2(2,40) = 2.99$, $p = .062$. This difference is shown in the overall faster reading times for the preferred condition in both positions, $F1(1,35) = 15.6$, $p = .0002$, $F2(1,20) = 5.87$, $p = .02$.

As Fig. 1 shows, type-shifting and non-preferred reading times are similar at post-verbal positions, $F1(1,35) = .46$, $p = .50$, $F2(1,20) = 0.99$, $p = .75$. The difference between preffered and non-preffered constructions, however, was significant, $F1(1,35) = 9.50$, $p = .003$, $F2(1,20) = 5.09$, $p = .03$, as was the difference between preferred and type-shifting in the analysis by subjects, $F1(1,35) = 14.13$, $p = .0004$, and marginally significant in the analysis by items, $F2(1,20) = 3.77$, $p = .06$. In the analysis of the V+1 position, there was a main effect of verb type in the analysis by subjects, $F1(2,70) = 4.03$, $p = .02$, $MSE = 3978$, $F2(2,40) = 1.75$ $p = .19$, $MSE = 10355$, with preferred constructions yielding faster reading times than both, type-shifting, $F1(1,35) = 6.12$, $p = .018$, $MSE = 3759$, and non-preferred constructions, $F1(1,35) = 7.09$, $p = .012$, $MSE = 3529$. There were no differences at the V+1 position

Table 2
Mean reading times (and standard deviation) for sentence construction types in four sentence positions in Experiment 2

	Sentence position			
	Verb	Verb + 1 *the memo*	Verb + 2 *long*	Verb + 3 *before...*
Non-preferred (*read*)	388 (106)	455 (137)	441 (118)	383 (89)
Preferred (*typed*)	382 (103)	417 (141)	424 (114)	380 (101)
Type-shifted (*began*)	385 (106)	453 (162)	454 (107)	383 (100)

between type-shifting and non-preferred constructions. In the analysis of reading times at the V+2 position, there was also a main effect of verb type in the subjects' analysis, $F1(2, 70) = 3.31$, $p = .042$, $MSE = 22436$, $F2(2, 40) = 2.74$, $p = .077$, with preferred constructions faster than type-shifting, $F1(1, 35) = 5.94$, $p = .02$, $MSE = 2703$, $F2(1, 20) = 5.48$, $p = .024$. There was no significant difference between non-preferred and type-shifting constructions, and the difference between preferred and non-preferred constructions failed to reach significance, $F1(1, 35) = 2.62$, $p = .11$, $F2(1, 20) = 1.52$, $p = .22$. No significant differences were found at the V+3 position.

These results indicate that type-shifting constructions behave similarly to non-preferred constructions, with both yielding slower reading times than constructions that employ preferred verbs. It seems that contexts which further specify the nature of the activities performed by the agent NPs over object NPs set apart preferred and other types of verbs, including, as in the present case, non-preferred and type-shifting constructions. The results of this and the previous experiment, and what they say about the nature of type-shifting operations are discussed next.

6. General discussion

Three main hypotheses were raised concerning the behavior of type-shifting constructions in contexts. One was that context would act by *canceling* the type-shifting operation; another was that context would act by *narrowing down* or *constraining* the range of telic roles to be selected within the lexical entry for the complement noun—thus speeding up the coercion operation. A third alternative was that context would remove the underspecification—if any—of verbs, setting apart verbs that were preferred for given contexts. According to this third alternative, then, there would be no difference between type-shifting and non-preferred constructions and both would be read slower than preferred constructions. I will examine these hypotheses in light of the results of the two experiments, and discuss type-shifting operations in the context of semantic interpretation during sentence processing.

The first hypothesis to consider is that of the *canceling* of the type-shifting operations in virtue of contextual information. The idea is that, given that context provides the necessary information that would otherwise—and by assumption—be chosen in the entry for the complement NP, there is no need for coercion to take place. This view would in fact require the postulation that type-shifting operations would only be obtained if there were no available contextual clues to further determine the nature of the underspecified event. Thus, in a contextual situation in which *book* is referred to as an

edible product (to mention again the example from Lascarides & Copestake, 1998, in (6) above), then *enjoyed the book* would be interpreted as *enjoyed eating the book*. If in fact context cancels the coercion process, the V + NP construction is interpreted not as a function of the noun's possible telic roles, but as a function of background information that acts to pre-determine the nature of the NP interpretation. If context plays a role in the interpretation of the V + NP construction, then one can claim that type-shifting operations are not lexically driven, and enriched composition, if obtained, is a product of non-lexical information. This in fact seems to be the position that Jackendoff (1997) takes regarding the first of "two steps" in the coercion process; for him, coercion is a process that relies first on a rule such as (7) (Jackendoff, 1997, p. 61).

(7) Interpret NP as [$_{Activity}$ F(NP)],

where F is a function expressed by the main verb and NP is its argument. As for the second step, however, Jackendoff seems to agree with Pustejovsky that coercion must select a role from those represented within the noun's semantic or qualia structure. One of the predictions made in the present study was that the coercion process would dispense with the "second step," given that the nature of the activity would be determined by the information provided by the context. If this were the case, reading times for type-shifting constructions would be similar to those of preferred constructions without the need for an extra semantic process to be generated. Clearly, this did not occur. Although, initially, this seemed to be a plausible outcome of the effect of context in the interpretation of type-shifting constructions, it still leaves open how context would pre-determine what occurs at post-verbal regions of the sentence, once the noun lexical item is accessed in constructions that require event complements. Even if context pre-determines the semantic nature of the activity that the verb selects as its complement, it is not clear how it triggers the process by which the NP changes its semantic type, assuming that the entity-NP does change its type to an event.

The results of the present experiments, however, do not seem to support the idea that type-shifting operations are necessarily cancelled by contextual demands. In fact, they suggest that there are no type-shifting operations whatsoever—if these are construed as operations over lexical-semantic information. When we look at the time course of sentence interpretation—as revealed by self-paced reading times—the two experiments show that there are no differences between the three sentences (Experiment 1) nor between non-preferred and type-shifting conditions in post-verbal sentence positions (Experiment 2). The failure to replicate the results of McElree et al. (2001) in Experiment 1 and the lack of difference between non-preferred and type-shifting constructions in Experiment 2 should cast doubts on the

hypothesis that any type-shifting function (even of the type in (7)) occurs—at least type-shifting operations that result in longer reading times as a function of more complex semantic processes.

Jackendoff (1997) and Pustejovsky (1995) suggest, however, that the two "steps" of the coercion process are mandatory (see also Pinango et al., 1999), whereby access to *book* after *enjoy* would trigger the type-shifting process even when the context makes clear that *enjoy the book* is about *eating*, not *reviewing* or *reading*. Thus, another plausible hypothesis for the effect of context is that of *constraining* the range of telic roles that may serve to give the entity-NP its event interpretation. Notice that this hypothesis relies heavily on the idea that there are *n* possible roles that may be *stored with the lexical entry*. It is consonant with the idea that even intra-lexical relations within the sentence may play the role of context—e.g., by manipulating the agent, the nature of the event that is performed over the NP complement can be constrained. Compare (8a) and (8b). While for (8a) it is plausible to interpret the book as being the writer's work, in (8b) it seems more plausible to interpret the book as being the student's property.

(8a) The writer enjoyed his new book.

(8b) The student enjoyed his new book.

Although there is nothing in principle that prevents us from interpreting *book* in (8b) as the product of the student's labor, we often use information about the agent's role (possibly, typical role) to help constrain the possible interpretations of the roles that the NP object plays in the event denoted by the verb. Since the coercion process—if it exists at all—is by nature an operation over a selected range of possibilities (specified in the lexicon, according to Pustejovsky's proposal), it may come as no surprise that, by reducing the possible roles to be selected within the lexicon, reading times would be decreased. Traxler et al. (2002) also argue that different agents would "not circumvent the need for type-shifting the complement from an entity to an event, but would alter the content of the interpolated semantic structure." It is not clear, however, what is meant by "alter the content of the interpolated semantic structure." If the nature of the agent constraints the type-shifting operation, it remains to be seen what would be changed in the semantic structure beyond the predicted effects of the two-step coercion process.

One of the predictions of the present study was that, if in fact there was reduced semantic activity as a function of contextual information, there would be a delay in the semantic processing of type-shifting constructions at positions immediately after the verb. Type-shifting constructions would initially behave like non-preferred constructions, but would quickly—perhaps immediately after the NP—behave more like preferred constructions. This hypothesis was not corroborated by the present results, casting further doubts on the idea that *semantic*

interpolation is involved in the process of interpreting type-shifting constructions.

A third hypothesis about the effect of context on type-shifting operations states that context acts by removing the underspecification of the main type-shifting verb, leveling them out with non-preferred verbs. Given that preferred verbs are taken to have a better semantic fit with the context of the sentence, when context further specifies the nature of the event, there is a processing advantage of preferred verbs over other verbs (including, as in the present case, type-shifting and non-preferred). In this case, the main effect of context is that of speeding up reading times to post-verbal positions. Therefore, longer reading times would not reflect intra-lexical semantic operations, but a pragmatic process of integrating less preferred constructions within the context. This hypothesis follows from the view that lexical concepts are atomic, therefore coercion cannot possibly be a process of selection of an activity *within* the semantic representation of a lexical item. Moreover, the assumption here is that all processes of integration of a semantic representation (say, processes beyond the logical form and the denotation of the constituent items of a linguistic expression) are pragmatic and inferential.

This view can account for the pattern of results obtained here and explain the effects obtained in McElree et al.'s and Traxler et al's studies. More specifically, the suggestion is that type-shifting process—if they exist at all—are pragmatic in nature. It is possible that these processes are triggered by the underspecification of the linguistic expressions. It has been suggested (Fodor & Lepore, 1998) that if there is anything wrong with (9), it is not that it is semantically ill-formed, as suggested by Pustejovsky (1995), but that it leaves the reader/listener wondering what John began doing with the dictionary.

(9) John began the dictionary

In fact, what is wrong with sentences of the form *begin NP*, *enjoy NP*, and the like, then, is that they violate Gricean-type *conversational maxims* such as the *maxim of quantity* (make your contribution neither more nor less informative than required) and the *maxim of manner* (avoid obscurity and ambiguity). Notice that, in discourse-like contexts that specify the activities that *begin* refers to, the underspecification is reduced or removed, thus satisfying the *conversational maxims*. In such conditions, type-shifting verbs behave just like other preferred or non-preferred verbs for particular contexts.

In conclusion, the experiments presented here show no evidence for enriched composition, but can be taken to support a classical view of semantic compositionality. It is yet to be established exactly what determines the interpretation of expressions such as *begin the book* as *begin reading/reviewing/writing the book*, i.e., whether or not type-shifting operations can be characterized in semantic terms without appeal to intra-lexical selection of

"telic roles," or if such operations are in fact beyond semantic structures. Fodor and Lepore (1998) suggest a solution similar to that of Jackendoff's first step in the coercion process (as in (7) above). It is unclear what coerces an object NP into an activity—or even if NPs can be taken as belonging to types such as activity and entity. Our intuitions about *begin a book* as implying *reading* are justified by what we know about books—that they are written and often read and rarely eaten—not by what is specified in the lexicon (see Fodor & Lepore, 1998). My suggestion is that what is taken to be a type-shifting operation over semantic structures (as in Partee's theory or as in Jackendoff's first step in the coercion process) is a set of inferential processes beyond the logical form (and truth-condition meaning) of an expression, together with the denotation of its constituent items. Elaboration of this view is beyond the scope of this paper, suffice to say here that these inferences—deductive *and* abductive—are purely pragmatic in nature and not logical entailments or meaning constitutive.

Appendix A. Materials used in Experiments 1 and 2

For each paragraph context (numbered 1–21) there was one sentence triplet (target sentences in italics), corresponding to each one of the verb types: type shifting, preferred, and non-preferred, respectively. Sentences in italics were used in Experiments 1 and 2 while paragraphs were used in Experiment 2 only.

1. The secretary would always be sure to work ahead of schedule. She was asked to work on the memo. *The secretary began/typed/read the memo long before it was due.*

2. The pilot was inexperienced. He could not get the airplane's landing gear to work while taking off. *The pilot mastered/flew/landed the airplane after he fixed the control.*

3. The author was always very busy. His editor asked him to review a book while he was working on his own novel during the summer. *The author started// wrote/read the book during his summer vacation.*

4. The alpinist was only a beginner. He was nervous about his upcoming training because he was going to try a very difficult mountain. *The alpinist attempted/climbed/scaled the mountain after he trained.*

5. The artist was well known for his beautiful portraits. Many people requested his work and it was difficult for him to find the time to conceive the portrait that his mother requested. *The artist began/painted/analyzed the portrait for his mother when he found the time.*

6. The doctor had many patients. He had to write a patient report for every test that he sent away to be analyzed. *The doctor expected/received/composed the report of the test to add to his patient's file.*

7. The chef was very meticulous. He would create his meals long in advance so he could taste them often to be sure that they would turn out perfectly. *The chef started/prepared/ate the dinner before any guest had arrived.*

8. The composer was behind schedule. He still had to work on planning the symphony for the music festival being held in the park. *The composer started/wrote/directed the symphony for the concert in the park.*

9. The pilot was very nervous because he was a novice. He only wanted to practice using the plane with the bright red tail because it was easy to maneuver. *The pilot preferred/flew/landed the biplane with the bright red tail.*

10. The guard was afraid of working the overnight shift. He would always double check that all of the building's doors were locked. *The guard tried/opened/closed the door to the basement.*

11. The couple had just bought an old broken down house. They wanted the contractor to tare down the old house and put a brand new house in its place. *The contractor started/built/demolished the house for the young couple.*

12. The waitress was tired and wanted to go home. Before she could leave she had to serve the customers coffee and make a new pot. *The waitress started/poured/drank the coffee before she went home for the night.*

13. The columnist was a perfectionist. He worked for a large newspaper and would be sure to double check his articles before handing them in to be printed. *The columnist finished/wrote/reviewed the article for the newspaper.*

14. The chef enjoyed trying new things. He decided to try experimenting with some new spices for the dinner he was planning. *The chef savored/tasted/bought the spices at the grocery store on the corner.*

15. The architect was hoping to be promoted. He wanted to impress his boss by developing a sketch for a beautiful house as soon as possible. *The architect started/designed/planned the sketch for a beautiful new house.*

16. The cuisinier was always ahead of time. He had planned the buffet for the restaurant by the river long before any guests were expected to arrive. *The cuisinier started/prepared/served the buffet for the restaurant near the river.*

17. The teacher was very kind to her students. She had a Valentine day party for them. All of the children and the teacher were fond of the delicious cupcakes brought to the party. *The teacher enjoyed/ate/served the cupcakes in the classroom.*

18. The student was a procrastinator. He was behind schedule and had a lot of work to catch up on for his English class. *The student began/read/wrote the paper late in the semester.*

19. The car salesman was experienced. While shopping for a new vehicle for his family he wanted to test-drive a sedan because he knew it had safer brakes than the van. *The salesman preferred/drove/parked the sedan with the safer brakes.*

20. The engineer was very busy. His boss assigned him with yet another project. He would have to get to work soon so he could finish it all on time. *The engineer started/wrote/read the plans for the new project he was assigned.*

21. The professor was very organized. He left enough time to prepare his notes before his psychology class and carefully reviewed them. *The professor began/read/wrote the notes for his psychology class at the university.*

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