COLLEGE STUDENTS’ ACCURACY IN PREDICTING THEIR LEARNING OF NOVEL WORDS

A thesis submitted to the Kent State University Honors College in partial fulfillment of the requirements for General Honors.

by

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This experience was a truly enriching one,

Sri Siddhi N. Upadhyay
Readers’ knowledge of vocabulary is an important component of reading comprehension skill, and a number of studies demonstrate the link between vocabulary size and reading comprehension skill (Cain, Oakhill, & Lemmon, 2004; Connor & Zwolan, 2004; Krashen, 1989; Nagy, 1988, 2007; Ouellette, 2006; Proctor, August, Carlo, & Snow, 2006; Qian, 1999; Stahl & Fairbanks, 1986; Sternberg & Powell, 1983). Readers routinely encounter words that vary widely in familiarity from extremely common function words, such as “the,” to words that they have never seen before; in fact, encounters with unknown words are not uncommon (Morris & Williams, 2004). Estimates of vocabulary growth suggest that skilled readers, 18-25 years old learn more than five new words a day and that most of these words are learned from context (Landauer & Dumais, 1997) without benefit of explicit instruction (e.g. Nagy, Herman, & Anderson, 1985). A variety of factors likely contribute to the possibility that a reader will successfully infer a meaning for an unfamiliar word in context, one of which is their metacognitive skill. Many studies have established that readers make predictions and judgments about their own processing and performance during context comprehension based on metacognitive and metacomprehension processes. Their metacognitive awareness while incidentally processing in silent self-paced reading likely influences how
well they learn from context (Dunlosky, 2002). The role of metacognitive awareness is important in these types of judgments during the reading process and also on the subsequent test performance. The focus of the current study is on how well skilled readers infer meanings for novel compound words and whether their metacognitive judgments are sensitive to the difficulty in deriving novel word meaning. The knowledge gained from studying readers’ metacognitive knowledge and incidental word learning lends insight to reading, learning, and memory processing in general as well.

**Incidental Word Learning**

Skilled readers learn words incidentally while reading, and use implicit processing to derive and understand word meaning during reading (Carlisle, Fleming, & Gudbrandsen, 2000; Nagy, Anderson, & Herman, 1987; Sternberg, 1987). Readers can typically use two primary sources of information to derive word meaning for an unfamiliar word: the surrounding sentence context and information from the morphological constituents of a word itself (Nagy & Scott, 2000; Graves, 2006). Numerous studies have demonstrated the importance of both sentence context and morphemic structure in the learning of new vocabulary items both through direct instruction (Kuhn & Stahl, 1998; Baumann et al., 2002; Graves & Hammond, 1980; Levin, Carney, & Pressley, 1988; Wysocki & Jenkins, 1987) and incidentally (Brusnighan & Folk, 2012; Chaffin, Morris, & Seely, 2001, Morris & Williams, 2004).

Several studies have demonstrated that readers can successfully acquire word meaning incidentally during silent reading, and that they are sensitive to contextual
information during this process (Brusnighan & Folk, 2012; Chaffin et al., 2001). Chaffin, Morris, and Seely (2001) established that readers are able to use surrounding contextual information to infer a meaning for an unfamiliar word. Further, they found that the time that readers spent reading sentence context was related to the informativeness of the context, and that readers could distinguish which areas of context were relevant for inferring a meaning for an (unfamiliar) novel word. Chaffin et al. embedded novel words in one of two context conditions: an informative context that included information as to the intended interpretation of the novel word, and an uninformative context that did not provide information about the intended interpretation of the novel word. Readers spent less time reading the uninformative context when it followed a novel word than the informative context. This suggests that readers are sensitive to the level of informativeness in context regarding the definitions of novel words.

In addition to these findings that suggest that readers are able to distinguish between more relevant and less relevant contextual information, Morris and Williams (2003) reported evidence that readers are able to derive definitions for novel words with a single exposure to the stimuli and keep this meaning in memory for at least a short period of time as measured by a vocabulary test immediately following a reading session. The lag between exposure to the novel word and the vocabulary test was approximately 20 minutes, and readers performed at above-chance levels on a two-choice surprise vocabulary test.
A recent study replicated the vocabulary test findings while also demonstrating processing and word learning advantages when contextual and morphemic information converged on a consistent interpretation for a novel word versus when the two sources of information conflicted. Morphemic information refers to meaningful word units such as whole words or informative elements such as suffixes and prefixes (e.g., “slow” has one morpheme and “slowly” has two). Brusnighan and Folk (2012) had college-aged participants read sentences that contained embedded novel (i.e., unfamiliar) compound words that were either semantically opaque or transparent within informative contexts; this semantic quality of opaqueness refers to the informativeness of the individual morphemic constituents that make up the novel compound word in deriving word meaning. A transparent novel word is made up of two words consistent with the informative context within which it is embedded, for example the word *drinkblend*, within context that informs the reader about a drink. An example of a novel opaque word within the same informative context about a drink would be *deskdoor*, because the morphemic constituents of the novel word do not match the context, nor are they informative to the reader about the meaning of the word (i.e., breaking *deskdoor* into its constituents of “desk” and “door” will not help derive a contextually correct meaning).

Brusnighan and Folk (2012) found that readers spent more time reading sentences containing novel opaque compound words than those sentences that contained embedded novel transparent compound words. This suggests that readers automatically decomposed the novel compound words into their constituents in order to infer a meaning, despite the presence of prior context that clearly suggested a meaning for the novel word. When the...
context and the morphemes of the compound words agreed, readers spent less time reading (transparent compound condition) than when the compounds were embedded in neutral context, indicating a benefit for combining contextual and morphemic information to establish word meaning. Interestingly, when contextual and morphemic information disagreed in the opaque compound condition, readers spent more time reading than when the compound word was embedded in neutral context. That is, readers had more difficulty inferring a meaning for the opaque compound words when contextual information supported a meaning different from that suggested from the word constituents of the novel compound. The results of the vocabulary test showed that participants accurately recognized the correct meanings for novel compound words after seeing them only once in informative context, which suggests that readers learned the meanings of the novel compound words from a single reading exposure and were able to retain those meanings directly after the reading session. The correct definitions for the novel opaque compound words were selected twice as often when participants read them in informative context, as compared to when they made selections by using the morphemic constituents that did not reveal the intended meaning (i.e., had never seen the words in an informative context). However, while the data suggest that readers were able to infer a meaning for the opaque compound words, they did so less accurately than for the transparent compound words, suggesting an additional advantage for word learning when morphemic and contextual information can be combined to establish a meaning for a novel word (as in the novel transparent condition).
The findings of Brusnighan and Folk (2012) are crucial because they indicate that skilled readers derive word meaning by both morphological decomposition of a novel compound word’s constituent word parts to figure out meaning, and by linking such word components to arrive at an initial definition for the novel compound, even when presented with strong informative preceding sentence context that indicated the meaning of the word. The results also suggest that there is an advantage to combining both sources of contextual and morphemic information during incidental word learning as evidenced by reduced reading times and better performance on the vocabulary test when the results of morphological decomposition were consistent with the prior context (e.g., *drinkblend* in a context about a drink). The reading time data also demonstrated that there was an advantage for transparent items when morphemic and contextual information converged on a definition, but a disadvantage for opaque items when morphemic and contextual information pointed to different interpretations (e.g., *deskdoor* in a context about a drink). Overall, readers’ reliance on combined contextual and morphological sources of information during reading and vocabulary acquisition processes leads to better vocabulary test scores when those sources were consistent (Kuhn & Stahl, 1998; Baumann et al., 2002; Graves & Hammond, 1980; Levin et al., 1988). These findings are particularly interesting, especially when one considers that even in the presence of prior context indicating the intended meaning of the word, which rendered decomposition unnecessary, readers still engaged in using the strategy of parsing morphemic word constituents of the novel compounds.

**Metacognition and Word Learning**
Brusnighan and Folk (2012) argued that readers’ metacognitive skills play a role in their incidental word learning success. When they re-analyzed their sentence reading time data as a function of accuracy on the vocabulary test, they found that readers spent more time reading sentences containing novel words for which they later correctly identified the meaning on the vocabulary test versus when they were incorrect on the vocabulary test. Brusnighan and Folk (2012) suggested that readers’ ability to monitor their comprehension is related to their ability to learn new words from context.

Metacomprehension, or the self-assessment of an individual’s own learning of text material, is an important aspect of learning from context; the judgments of metacomprehension a reader makes are a subset of metacognitive judgments. Research in the area of metacomprehension has largely centered on the question of how students judge their learning of text material (Baker & Dunlosky, 2006; Maki, 1998b; Weaver, Bryant, & Burns, 1995). The process of examining how readers make metacomprehension judgments has remained consistent. Participants read paragraphs, and at a particular point in time after reading each paragraph, they are asked to make a metacognitive judgment reflecting how well they believe they will perform on a test over the material. Readers usually make these types of judgments following a 100-point confidence scale, (0 –100), on which higher ratings indicate a greater level of confidence in performing well on the test.

Several studies have determined that the cues of domain familiarity and processing ease influence how students make these judgments (Baker & Dunlosky, 2006;
Maki, 1998a; Dunlosky, 2002). Another such cue that plays an integral role in the process by which readers make metacognitive and metacomprehension judgments is the idea of momentary accessibility, which refers to the idea that in the brief span of time before a reader makes a judgment, the reader tries to recall as much information about the material as possible (Morris, 1990; Baker & Dunlosky, 2006). Accordingly, metacomprehension judgments are then made based on access to the text, with higher ratings when recalled information can be accessed quickly. When participants make such immediate judgments, text content must be accessible, and as such, metacognitive and metacomprehension cues are highly important to studying how readers judge their learning of text material.

Studies on metacomprehension, i.e. the assessment of an individual’s self-understanding of text material, prove crucial to the larger area of research on learning from text. Metacomprehension is central to formal education and many everyday contexts including reading in skilled reader and adult populations (Dunlosky, 2002). One of the main questions regarding how people assess their own comprehension aims to understand the bases of metacomprehension judgments.

In one such study, Rawson and Dunlosky (2002) manipulated ease of processing. Participants read texts, predicted their performance for each text, and then took a test related to the material they had read; ease of processing in this experiment was manipulated by varying the level of coherence in the texts the participants read. Coherence was varied by manipulating causal relatedness across sentence pairs and by changing sentence structure within paragraphs of text. Through these experiments Rawson and Dunlosky found that the magnitude of the participants’ predictions increased
with the increase in coherency of the text, which indicates that the participants’
predictions reflected processing ease.

Current metacognition theory and the cue-utilization framework of metacognitive
monitoring contribute to the understanding of how metacomprehension judgments are
formed (Dunlosky, 2002; Koriat, 1997). According to these frameworks an individual’s
metacognitive judgments are inferential and are reflective of theories regarding how a
variety of cues relate to subsequent test performance. The cues influencing metacognitive
judgments are a result of aspects from materials to be studied, strategies for encoding
items, or from retrieval attempts for judgments (Dunlosky, 2002; Koriat, 1997; Weaver &
Bryant, 1995; Dunlosky & Nelson, 1994; Benjamin, Bjork & Schwartz, 1998; Matvey,
Dunlosky, & Gutentag, 2001; Morris, 1990). Research also demonstrates the role that
ease of processing plays in metacognitive judgments for word-level materials including
individual words as well as paired associates (Dunlosky, 2002; Begg, Duft, Lalonde,
Melnick, & Savito, 1989; Matvey et al., 2001).

In one such study, one group of participants studied lists of words that varied in
word frequency, while another group of participants rated the memorability of each word,
and the last group rated the ease of studying each word (Begg et al., 1989, Experiment 1).
The findings indicated that high-frequency words were rated by participants as easier to
study and were also judged to be more memorable than low-frequency words. However,
one interesting result was reflected in the performance of the participants on the
subsequent recognition test; the participants’ performance was worse for high-frequency
words than it was for low-frequency words. In accordance with these findings, Begg et al. determined that judgments of learning for words are based on ease of processing principles.

A main question regarding the ease of processing hypothesis and its extension in application beyond verbal materials to text materials is how ease of processing might be conceptualized in research studies focusing on reading text. There is potential application of ease of processing in text materials, as research shows that ease of processing has been determined to be a factor in participants forming metacognitive judgments for text; in these studies participants were instructed to read several texts, make a metacomprehension judgment for each text, and complete a comprehension test for each text (Dunlosky, 2002). Further evidence of these applications can be seen in studies examining how manipulations of ease of processing affect judgment magnitudes in text materials (cf. Begg et al., 1987). Research in the area of text comprehension shows that difficulty in processing texts increases as the coherence of the material decreases (e.g. Britton & Gülgöz, 1991; Kintsch, 1998). Accordingly, if performance predictions are a reflection of ease of processing in text materials, then one can expect participants’ prediction magnitudes to increase directly as the coherence of the text material increases as well. Dunlosky (2002) found indeed as predicted, the predictions of participants increased as text coherence also increased, which supported the hypothesis that participants’ performance predictions of text materials are informed by processing ease of the text material.
Current Experiment

The current study examines how skilled readers infer the meaning for a novel compound word and their metacognitive judgments about the process of online processing during reading. Brusnighan and Folk (2012) established that when morphemic information and informative context converge on an interpretation for a novel word, the context is easier to read and process than when the two sources suggest different interpretations, which is consequently perceived as more difficult, as evidenced by slower reading times. Following this evidence the question arises whether readers are sensitive to this difficulty in processing. The current study exploits this difficulty in processing to examine whether readers’ difficulty in processing these materials is reflected in their metacognitive judgments regarding their ability to derive the correct definition for a novel compound word and remember this definition later. Moreover, the current experiment explores the relationship; if indeed there is one, between processing time, difficulty, and readers’ metacognitive judgments of their inferences about how well they derived a meaning for a novel word. The main research question is whether readers’ processing time difficulty in the sentence materials affected their subsequent metacognitive judgments about how well they learned the novel words.

The current experiment also explores the differences in difficulty between processing semantically opaque and semantically transparent novel words to investigate skilled readers’ metacognitive knowledge. In this study, metacognitive knowledge is used to mean how sensitive readers are to the processing difficulty involved in reading
sentences that contain opaque novel words as well as whether this processing difficulty will influence their confidence judgments for deriving the correct definition in terms of accuracy performance on the vocabulary test and remembering this definition for the aforementioned surprise vocabulary test. In the current study I aimed to explore five main hypotheses. First, I predicted that readers will experience greater processing difficulty, as measured by reading time, on sentences containing opaque novel compound words versus transparent novel compound words. Second, I predicted that readers will have higher metacognitive judgments following sentences containing transparent novel compound words versus sentences containing opaque novel compound words, which represents their ease of processing for transparent words versus opaque words. Third, I predicted that the metacomprehension judgments made by readers would correlate as well, and fourth, I predicted that the longer the amount of time that readers spend reading a vocabulary test item, the more likely they will be to get that item correct, and the time spent reading the test item is an indication of memory retrieval. Finally, I predicted that readers’ global metacognitive judgments regarding the difficulty of both tasks, the self-paced reading session and vocabulary posttest, respectively, would be lower than their pretest judgments. This would indicate that readers are sensitive to the difficulty of the sentence materials as well as the ease of processing, and the effects of time-spent reading would be reflected in their global judgments. The pretest judgment could be assumed to be made under naïve reasoning, as readers were not familiar with the tasks. However, the posttest judgments should reflect the readers’ metacognitive knowledge about their metacomprehension judgments made during the reading task, the difficulty of the sentence context, as well as
the difficulty in selecting the synonym choice for the vocabulary test when the novel words were presented out of context and readers had to face the challenge of retaining not simply the definition they derived, but the correct one, which was influenced by the time spent reading the sentences.

1Hereafter, “skilled readers” refers to college-aged readers and their skills are examined within context; no reading comprehension skill test was used to examine individual differences between participants.
Participants

In this study 98 college undergraduate students participated from the Kent State University Psychology Department’s subject pool of male and female students. Participants were all native speakers of English and reported no reading disabilities.

Materials

The self-paced reading task included sentences containing two types of novel compound words. These novel compound words were designated as either semantically transparent or opaque and were embedded in sentence contexts that contained informative context as to the intended meaning of the target word. Twenty sentences and forty novel compound words were taken from Brusnighan and Folk (2012). An additional forty sentence frames and eighty novel compound words were created for inclusion in the current study.

Target Words. Target words were chosen by referring to ratings of semantic transparency, ratings of sentence predictability, and agreement between provided definitions and those to be used in the experiment (see Brusnighan & Folk, 2012 for details). Two sets of sixty target words were included, with one target word in
each of the two conditions. Novel transparent target words were formed by combining two monomorphemic words, such that if the meanings of said morphological constituents were used to derive a meaning for the novel compound word, the result would be a meaning that is semantically related to the meaning instantiated by the sentence context in which they were embedded. For example, the novel transparent compound word *drinkblend* would have a definition that is semantically related to that supported by the sentence context, in this case, some sort of mixed drink. Novel opaque target words were formed by combining words that were unrelated to the sentence context. If readers attempted to derive a definition for the compound from the individual morphological constituents, the process would not be helpful in arriving at the semantically correct meaning, as indicated by the sentence context. For example, the novel compound *deskdoor*, which was presented within sentence context to mean a drink, and similar to the opaque familiar word cocktail, was in the opaque condition. Using the morphological constituents of a novel opaque word such as *deskdoor* would not be helpful for the readers to arrive at the correct definition of the word within the context frame.

**Sentence Frames.** Sixty experimental sentence frames were created. Two counterbalancing conditions were made such that the 120 novel words were presented in the 60 sentence frames in alternating conditions. The sentence frames consisted of two sentences. The first contained context that indicated the intended
meaning of the novel compound word that preceded the novel word. The second sentence contained a synonym of the intended meaning of the novel compound word.

**Metacognitive Judgment Questions.** Readers were asked to make several metacognitive judgments on a five-point Likert scale throughout the course of the self-paced reading task. After the presentation of each of the sixty sentence frames, readers were instructed to answer two metacognitive judgment questions, regarding first, how well the participant judged he or she was able to derive a definition for the novel compound, hereafter referred to as *judgments of derivation*, or JODs, and second, how well the participant judged he or she would be able to remember the definition of the novel word, hereafter referred to *judgments of retention*, or JORs.

**Global Metacognitive Measures.** Readers were also asked to make two global metacognitive judgments for the entire task. The first global measure was asked at the beginning of the experiment, after the instructions and before the experiment began and asked each participant how well the participant judged he or she would perform on the task. The second global measure was asked at the end of the vocabulary test and asked how well the participant judged he or she did overall on both the self-paced reading task and the vocabulary test after completing the
entire experiment and being able to reflect. These global judgments were also made on a five-point Likert scale.

**Filler Sentences and Comprehension Questions.** Twenty filler sentences were intermixed with the sixty experimental sentence pairs. The filler sentences did not contain any novel words. A “yes or no” comprehension question was asked after each filler sentence to ensure that readers read for comprehension.

**Vocabulary Test.** After the self-paced reading session, each participant was presented again with the novel words, this time in isolation out of the informative context sentence frames, and asked to match each novel compound word with the correct synonym in a surprise vocabulary test. Participants had to select the intended meaning for each novel compound out of four possible choices. The choices included the correct answer, and three unrelated incorrect answers.

**Apparatus**

Sentences were presented on a VGA color monitor, with the first sentence always presented on the first double-spaced line and the second sentence always presented on the second double-spaced line. The characters were lowercase, with the exception of the first character of a sentence or a proper name. Materials were presented using E-Prime software.

**Procedure**
The experiment consisted of two tasks. The first task was a self-paced reading task, and the second task was a surprise vocabulary test.

**Self-Paced Reading with Metacognitive Judgments.** The experiment began with the presentation of two practice items that consisted of a sentence context frame with a novel word embedded; one practice item included a novel opaque compound word and the other practice item included a novel transparent compound word. This was followed by the presentation of the global metacognitive question and then the presentation of the experimental and filler sentences. Two metacognitive judgment questions were asked after the presentation of each experimental sentence.

Each participant read a total of 80 sentences, 20 filler sentences randomly interspersed with 60 experimental sentences. Each of the 60 experimental sentence frames appeared with one of the novel compound words inserted, and the selection of the target word condition (novel or opaque) by sentence frame was counterbalanced across participants in a Latin square design. That is, each reader saw half of the experimental sentence frames with a novel opaque compound word and half with a novel transparent compound word. Because the reading task was self-paced, the participants indicated when they had finished reading the sentence pairs by pressing a key. The key press removed the sentence pair from the screen, and advanced to the next item. Next, the first metacognitive question appeared asking the participants how well they were able to derive a
definition for each novel word. The participants were instructed to make this judgment on a five-point Likert scale as they did for the global judgments with 1 = 0%, 2 = 25%, 3 = 50%, 4 = 75%, and 5 = 100%. After a key-press, the second metacognitive question appeared asking the participants how well they judged their memory for the definition for the derived word; participants made this judgment on a five-point Likert scale as well. After pressing the key once more, the next randomized experimental sentence or filler item would appear and participants would press a key once they finished reading to again advance to the next item or the corresponding metacognitive questions for experimental sentences, until all eighty items had been presented and read.

Once the self-paced reading session was completed and participants had answered the accompanying metacognitive questions, the participants proceeded immediately to the second task. The second task was the surprise vocabulary test. That is, it was not revealed to the participants that they were being asked to make a metacognitive judgment regarding how well they would remember the definition of the novel word specifically because they would need to remember this definition for a second task: the surprise vocabulary test. For the vocabulary test, participants were instructed to identify the intended meaning for each novel word out of four possible choices. The choices included the correct answer and three unrelated incorrect answers.
After the vocabulary test was completed, the participants were presented with the second and final metacognitive global question. The participants were asked to judge how well they thought they did on the experiment overall, having participated in both the first self-paced reading task and the second surprise vocabulary test.
CHAPTER III
RESULTS

The data were analyzed using multivariate analysis of variance (MANOVA) using SPSS 19 for five dependent variables. The five dependent variables included the two metacognitive questions asked after the presentation of each experimental sentence regarding how well the readers were able to derive a definition for the novel compound, judgments of derivation, or JODs, and how well they would be able to remember it later, judgments of retention, or JORs; the mean reading time of the experimental sentences; the mean accuracy on the vocabulary test, and the mean reading time and vocabulary test choice time. Outliers were excluded from the analyses for the reading time and vocabulary test choice time measures. An outlier was defined as any response that was two standard deviations above or below a participant’s mean. There was one within-subjects variable of the novel compound words’ semantic transparency (transparent or opaque). We also included measures of metacognitive pre-judgments and post-judgments which asked the participants to reflect on their overall performance in both tasks of the experiment, the self-paced reading portion and the surprise vocabulary test.

This data for the pre and post-judgments were analyzed with a one-way analysis of variance (ANOVA) with timing of judgment treated as a within-subjects variable. Further, to investigate the relationships between task difficulty and metacognitive judgments, I ran bivariate correlations. For the pre- and post- metacognitive judgments,
the one way ANOVA was significant, \( F(1, 94) = 55.58, p < 0.001 \), such that the readers’
mean posttest metacognitive judgments (\( m = 2.46 \)) were lower than the pretest judgments
(\( m = 3.53 \)).

The MANOVA revealed a significant main effect of transparency on all five
variables (see Table 1 for means). The JODs following sentences containing opaque
novel words were significantly lower than those following transparent novel words, \( F(1, 94) = 78.202, p < .001 \), and the same was found for the JORs, \( F(1, 94) = 120.358, p < .001 \). Similarly, sentence reading times were significantly longer for sentences
containing opaque novel compounds than transparent, \( F(1, 94) = 48.466, p < .001 \). For
the vocabulary test, mean choice times were significantly faster for transparent items than
opaque items, \( F(1, 94) = 159.797, p < .001 \), and participants were significantly more
accurate on transparent items than opaque items, \( F(1, 94) = 141.694, p < .001 \).

Table 1

Means for the Five Dependent Variables

<table>
<thead>
<tr>
<th>Condition</th>
<th>Judgment of Derivation</th>
<th>Judgment of Retention</th>
<th>Sentence Reading Time</th>
<th>Vocabulary Test Choice Time</th>
<th>Vocabulary Test Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Novel Opaque</td>
<td>3.40</td>
<td>2.29</td>
<td>10,317</td>
<td>7,362</td>
<td>.75</td>
</tr>
<tr>
<td>Novel Transparent</td>
<td>4.06</td>
<td>3.88</td>
<td>8,254</td>
<td>5,117</td>
<td>.93</td>
</tr>
</tbody>
</table>
Note. Reading and choice times are in milliseconds and accuracy is a proportion.

I ran bivariate correlations for the transparent conditions and opaque conditions separately (see Table 2 and Table 3). In the opaque condition, the judgments for both metacognitive questions were positively correlated so that the higher the readers’ judgments of derivation (JOD) for how well they could derive the meaning for a novel compound in the opaque condition, the higher their judgments of retention (JOR) for how well they thought they would retain the derived definition, \( r (95) = 0.44, p < .001 \). The positive correlation between the readers’ JODs and vocabulary accuracy indicate that the higher the JODs, the higher their accuracy on the vocabulary test, \( r (95) = 0.29, p = 0.004 \). The correlation between the reading time for the sentence within which the novel opaque compound was embedded, and the resulting accuracy on the vocabulary test suggests that the higher the reading time, the higher the accuracy on the vocabulary test, \( r (95) = 0.44, p < 0.001 \). This means that readers spend the most time reading the items that they later identified correctly in the vocabulary test. Choice time on the vocabulary test correlated negatively with accuracy on the vocabulary test, \( r (95) = -0.32, p = 0.002 \), indicating that the less time readers spent choosing an answer on the vocabulary test, the higher the accuracy on the test.

In the transparent condition, the JODs and JORs were also positively correlated, \( r (95) = 0.81, p < 0.001 \). The same was found for the correlation between JORs and the resulting accuracy on the vocabulary test, \( r (95) = 0.47, p < 0.001 \) and the correlation between sentence reading time and vocabulary test accuracy, \( r (95) = 0.32, p = 0.002 \).
Once again, vocabulary choice time and vocabulary accuracy were negatively correlated, $r (95) = -0.42, p<.001$.

Table 2

*Pearson Correlation Matrix for the Opaque Condition*

<table>
<thead>
<tr>
<th></th>
<th>JOD</th>
<th>JOR</th>
<th>Sentence Reading Time</th>
<th>Vocabulary Test Choice Time</th>
<th>Vocabulary Test Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>JOD</td>
<td>1.00</td>
<td>.44**</td>
<td>.16</td>
<td>.05</td>
<td>.29**</td>
</tr>
<tr>
<td>JOR</td>
<td>.44**</td>
<td>1.00</td>
<td>.02</td>
<td>.03</td>
<td>.09</td>
</tr>
<tr>
<td>Sentence Reading Time</td>
<td>.16**</td>
<td>.02</td>
<td>1.00</td>
<td>.09</td>
<td>.44**</td>
</tr>
<tr>
<td>Vocabulary Test Choice Time</td>
<td>.05</td>
<td>.03</td>
<td>.09</td>
<td>1.00</td>
<td>-.32 **</td>
</tr>
<tr>
<td>Vocabulary Test Accuracy</td>
<td>.29**</td>
<td>.09</td>
<td>.44**</td>
<td>-.32**</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Note. **p < 0.01
Table 3

*Pearson Correlation Matrix for the Transparent Condition*

<table>
<thead>
<tr>
<th></th>
<th>Sentence Reading Time</th>
<th>Vocabulary Test Choice Time</th>
<th>Vocabulary Test Accuracy Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>JOD</td>
<td>1.00</td>
<td>.81</td>
<td>.00</td>
</tr>
<tr>
<td>JOR</td>
<td>.81**</td>
<td>1.00</td>
<td>-.04</td>
</tr>
<tr>
<td>Sentence Reading Time</td>
<td>.00</td>
<td>-.04</td>
<td>1.00</td>
</tr>
<tr>
<td>Vocabulary Test Choice Time</td>
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<td>-.16</td>
<td>.15</td>
</tr>
<tr>
<td>Vocabulary Test Accuracy Time</td>
<td>.44**</td>
<td>.47**</td>
<td>.32**</td>
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</tbody>
</table>

Note. **p < 0.01
CHAPTER IV
DISCUSSION

In this study I found five main findings. First, I replicated the findings of Brusnighan and Folk (2012) establishing that there are advantages when contextual and morphological information combine to support a meaning for a novel compound word, indicating that readers automatically decompose novel words into their morphological constituents when inferring a meaning, even in the presence of prior informative context. Second, readers were sensitive to processing difficulty between the transparent and opaque items in making their metacomprehension judgments, suggesting a role for ease of processing. Third, clear relationships between metacomprehension judgments and vocabulary accuracy were displayed. Fourth, readers’ pretest global metacomprehension judgments were significantly higher than their posttest judgments. Fifth, choice time on the vocabulary test negatively correlated with accuracy on the vocabulary test so that the faster the readers’ reaction times on the test the higher their accuracy. This finding is consistent with participants retrieving an item from memory for the vocabulary test when they were correct.

**Morphology and Novel Words**

In the novel opaque condition, the contextual and morphemic information conflicted in that the context supported a meaning that was different from that which could be derived from the individual word constituents of the novel compound word.
the novel transparent condition, the morphemic and contextual information led to the same meaning. For example, in a sentence about a mixed drink, using the individual constituents of the transparent novel compound *drinkblend* to infer a meaning would lead to a meaning consistent with the context, but the opaque novel compound *deskdoor* would not. The results of this study indicated that students relied on both the sentence context and morphemic constituents of the novel compound words when deriving definitions for the novel words. Readers showed processing time advantages for novel transparent compounds in informative contexts, when contextual and morphemic information converged on a meaning.

This is supported by several of the measures in the data. Importantly, sentence-reading times were faster for sentences containing transparent novel compounds than opaque. In accuracy on the vocabulary test, choice times were significantly faster for transparent items than opaque items, and participants were significantly more accurate on transparent items than opaque items. Therefore, skilled readers are advantaged both in terms of processing time and vocabulary learning when morphemic and contextual information are available to them and converge to support a similar meaning for a novel word, suggesting that readers automatically decompose novel compounds into their constituents. The only reason differences should be found between the transparent and opaque conditions would be if readers were decomposing the novel words into their word parts, and using that to infer a meaning. Readers did not have to do this because prior context established a meaning for the novel word, suggesting that the morphological decomposition was automatic, replicating Brusnighan and Folk (2012).
Memory for Novel Word Meaning

Brusnighan and Folk (2012) also indicated that readers could learn meanings for novel compound words from just one reading exposure and retain those meanings directly after the reading session. Since readers made the choices more quickly after having previously been exposed to the novel words in context than when they had not seen them before, this suggests that in the experimental condition, readers were activating previously generated word meanings. A relationship between choice time and accuracy on a post-reading vocabulary test was also demonstrated in the current study. This suggests, once again, that readers can learn the meanings of novel words after just one exposure. Choice time on the vocabulary test was negatively correlated with accuracy on the vocabulary test such that the faster the readers’ reaction times on the test the higher their accuracy for transparent and opaque condition. This finding is consistent with participants retrieving the item from memory for the vocabulary test when they were correct.

Sensitivity of Metacomprehension Judgments about Vocabulary Learning

Clear relationships between the metacomprehension judgments and vocabulary accuracy were displayed. In the opaque condition JODs, regarding how well participants judged they correctly derive the definition for the novel compound, were significantly correlated to vocabulary test accuracy. In the transparent condition, JORs, regarding how well participants judged they could retain the definition they derived for the novel compound, were related to vocabulary accuracy. In both conditions, the JODs and JORs
were significantly correlated to each other. Overall, the significant positive correlations between readers’ metacomprehension judgments about how well they derived a meaning for a novel word or how likely they were to remember the meaning and vocabulary test accuracy are consistent with readers being sensitive to their success at inferring a meaning for novel words. However, further work is needed to explore the item-by-item accuracy of these judgments.

**Readers’ Sensitivity to Ease of Processing**

The current experiment’s results support the ease of processing hypothesis that participants’ performance predictions based on text materials are informed by processing ease of the text material (Dunlosky, 2002). Readers JODs and JORs were significantly higher in the transparent condition than the opaque condition. Several measures support the conclusion that the transparent condition was easier than the opaque condition. Specifically, the meanings of opaque novel compounds were more difficult to learn than transparent compounds, and this is reflected in the participants’ performance on the vocabulary test as well as the longer reading times participants demonstrated for opaque items relative to the transparent condition. Importantly, the readers’ metacomprehension judgments for their ability to derive the correct definition for the novel compound and remember the definition later on for the surprise vocabulary test were significantly lower for the (more difficult) opaque items than transparent items. Thus, the lower JODs and JORs in the more difficult condition suggest sensitivity to processing difficulty.
Unexpectedly, we did not find a negative correlation between reading times and judgments as this would have indicated that readers use processing difficulty when making their corresponding metacomprehension (JOD or JOR) judgments within the transparent and opaque condition. One reason that the correlation did not work out as expected may be that processing time in this paradigm (i.e., incidental word learning) may not be a good measure to use for these purposes. Brusnighan and Folk (2012) found that, when they reanalyzed their data as a function of accuracy on their vocabulary test, readers spent significantly more time reading sentences when they subsequently were correct on the vocabulary test versus when they were incorrect. This suggests that, while reading time indicates that opaque items were more difficult than transparent items, readers may have sometimes been more confident in their judgments because reading time is also related to subsequent accuracy on the vocabulary posttest.

Further Investigations

In future follow-up studies, I plan to explore the durability of readers’ concepts for the definitions they create and retain in memory to use on the vocabulary test. I replicated previous work (Brusnighan & Folk, 2012; Morris & Williams, 2004) that readers learn novel compounds after a single exposure and can also retain this meaning for a short period of time. The overall accuracy measures for readers on the vocabulary posttest (75% for opaque novel word meanings, and 92% for transparent word meanings) indicate that they perform better than chance, and so one possible follow-up I would like
to explore is the influence of time interval between the first self-paced reading session and the vocabulary posttest.

Moreover, because I found positive correlations between the readers' metacomprehension JODs and JORs and vocabulary accuracy, this suggests that readers are sensitive to how well they were able to infer a meaning for the novel compound word as influenced by effects in processing difficulty. Further work would include examinations of item-specific effects within the opaque and transparent conditions.
REFERENCES


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Appendix A: Practice Items

TRANSPARENT

The man went to the store to buy a new lampbulb that day.
He needed to replace the bulb in his lamp that went out.

The woman was working in her yard with a leaffork today.
The sharp fork was good for picking up fallen autumn leaves.

OPAQUE

The man went to the store to buy a new woodpile that day.
He needed to replace the bulb in his lamp that went out.

The woman was working in her yard with a tallboot today.
The sharp fork was good for picking up fallen autumn leaves.
Appendix B: Metacomprehension Judgment Questions

Practice Sample Items & Task 1: Self-Paced Reading Sentences:

Judgment of Derivation (JOD)

How well do you think you were able to come up with the correct definition for _____?
Likert Scale: 0%  25%  50%  75%  100%

Judgment of Retention (JOR)

How well do you think will you be able to remember the definition of _____?
Likert Scale: 0%  25%  50%  75%  100%

Task 2: Vocabulary Test:

How well do you think you were able to choose the correct meaning of the word?
Likert Scale: 0%  25%  50%  75%  100%
Appendix C: Global Judgment Questions

Pretest Judgment (after Sample Practice Items):

How well do you think you will be able to remember the definition of a new word you read for a later task?

Likert Scale: 0%  25%  50%  75%  100%

Posttest Judgment (after both tasks - self-paced reading and vocabulary test completed):

How well do you think you did on this task?

Likert Scale: 0%  25%  50%  75%  100%
Appendix D: Transparent Items

Bruce’s house was dirty so he started cleaning the floorcover first. The covering on the floor was still fairly new.

Bob felt sick from last night and took medicine for his brainpain today. The pain in his brain was getting worse.

Joe gets home-brewed corn whiskey from the boozemaker on Fridays. The alcohol maker has the cheapest prices in town.

The gambler played poker and won a cashprize just now. The cash prize winnings made a trip to the casino worthwhile.

John found a hole dug in his yard by the burrowrat this morning. These burrowing rodents can ruin a patch of land overnight.

Tim got his room key and gave his bags to the innworker to handle. The hotel employee took care not to drop the heavy bags.

Everyone is raving about the number one hit bigsuccess this week. The huge media success is sure to be a classic.

Every summer the gardener picks a large, ripe roundmelon off the vine. This round, juicy melon is a favorite seasonal fruit for many reasons.

The couple took off work and went on a(n) escapetriple trip last week. They escaped on a fun trip which was well deserved.

Jen wanted a new look and went to a salon to fix her hairsprig today. A single braid of hair made her look elegant.

The fraternity sent out invitations to the big dancebash just now. The social gathering is sure to be festive and colorful.

The musician clanged the snarebell three times. The instrument added excitement to the concert.
The captain left the harbor on his sailraft this morning.
This water craft was ready to be put to the test.

The harvester planted a lot of wheatcrop every year.
This type of grain fed his entire family.

Tim sat under the shady branches of his dryleaf once a week.
This type of tree was his favorite.

The truck driver disliked the traffic on the tollroad the most.
The road's toll rates were the highest in the state.

Matt has a new swagger to his walkstyle that is different.
This manner of walking made him more confident.

The new king claimed his throne as the rightful crownheir after all.
The deserving recipient was a born leader.

Ben received a Nobel Prize for his witdeed in physics.
This intellectual achievement was deserving of recognition.

Carol went to the fabric shop to buy wooltrim earlier today.
The soft material will make a good skirt.

The cobbler made holes in the leather with a shoetool very carefully.
This tool for leather had a sharp point.

Ann's seamstress made her a new frillgown for the party.
The garment had never been worn in public before.

Perched in a tree this morning was a single lakehawk looking around.
This bird was looking for fish to catch.

The prey was stalked and killed by the rangelion very quickly.
When the powerful animal pounced, it tore at the prey with its teeth.

The sportsman reeled in a record breaking graygill this morning.
The large fish is known for breaking fishing poles.

The pain in Jane's back was examined by the checkspine yesterday.
The vertebrae specialist ordered Jane to stay off of her feet.
Paul decided to brave the weather as he put on a freezecoat to go out in. The heavy jacket kept him from getting frostbite.

The astronomer spotted a radiant sunmoon at midnight. The bright moon was a rare and brilliant sight.

The coffee shop is becoming famous for its fresh beanblend lately. The new coffee blend is a customer favorite.

The big game hunters went on a deerhike this weekend. This buck hunting nature walk is a seasonal activity.

The new video technology being tested is the archscreen for consumers. This concave television provides a more realistic viewing experience.

At breakfast the chef put butter on the flatcake each time. The flat, doughy cake has been a favorite among customers for years.

Jim threatened to expose secrets and planned the cashthreat last week. Such intimidation for cash gain is considered illegal in this country.

Lisa works at the hospital and the day care as a babyhelper full time. The child care profession can be a challenging occupation.

Billy liked to play by twirling the spintoy he had. This spinning child’s toy was his favorite for months.

The rain on her garden caused the growth of a newsprout overnight. The new plant sprout looked great because the area was previously empty.

Steve put the cereal bowls in the kitchen storespace by himself. The storage space was big enough to hold all the china.

The party host used a blender to mix each guest a drinkblend last night. The mixed beverages were a great treat after dessert.

Sam collects shells like the clawshell on the beach. This type of shellfish is his favorite to look at.

The tale of the honorable and chivalrous trooplord was epic.
The medieval soldier was a brave member of the aristocracy.

Blake inhales the flowers' unique fondmusk every year. The sweet smell reminds him of spring.

The collapse of the mine shaft injured a coalpicker yesterday. The mine worker was happy to make it out alive.

The cook seasons his sauces with herbspice very often. The herbal ingredient is ideal for flavoring gourmet foods.

The new tree had snowflakes hanging from each slimtwig last winter. Each thin branch drooped with the weight.

The exterminator sprayed to kill each moldbug once a month. These mold-dwelling parasites like to hide in damp, dark spaces.

Sandy stepped on a nail and punctured the toetread of her boot. The bottom of her shoe needs to be repaired.

The fast music signaled Kay and her partner to perform the swifttrot for the crowd. This challenging dance was met with applause.

Mike made salads with fresh spudstalk for lunch. This crunchy vegetable is high in fiber when eaten raw.

The banquet table proudly featured a cheesebowl for all to see. The fine cheese serving bowl was a prized heirloom. Gloria made a latch for the door of her stickhut for safety. These types of shelter offer little other protection from burglars.

The gardener needed to trim the rapidly growing weedgrass on the driveway. This type of grass has to be maintained very often.

The outlaw fired at the sheriff with his sockgun in great haste. The hidden firearm was strapped inside the outlaw’s boot.

To keep his head warm in the snow, Jim bought a thickhat last winter. The headwear is only available at the outdoor store.

Jill took the lid off the mug to cool off the boilbrew this morning.
The hot drink was her favorite in the winter.

The fleas were everywhere and the dog suffered a fleshbite in the yard. These insect bites can be avoided by using special medicine.

In spring the flowers benefit from the mistdrop from the sky. The light rain showers cover the ground like a thin layer of water.

Carrie liked to take her kids to play in the childpark on weekends. This park for children has a giant jungle gym and slide.

The bug collector put all his specimens in a wormjar to keep. The insect container is designed for preservation.

The cook seasons his sauces with kiwiseed very often. The herbal ingredient is ideal for flavoring gourmet foods.
The truck driver disliked the traffic on the barn cart the most. The road’s toll rates were the highest in the state.

Jane ate the ripe and juicy blinklight very slowly. It was a sweet fruit that she wanted to enjoy.

At breakfast the chef put butter on the bowcamp each time. The flat, doughy cake has been a favorite among customers for years.

Jim threatened to expose secrets and planned the baketeam last week. Such intimidation for cash gain is considered illegal in this country.

Lisa works at the hospital and the day care as a cupshiner full time. The child care profession can be a challenging occupation.

Billy liked to play by twirling the yarnbox he had. This spinning child’s toy was his favorite for months.

The rain on her garden caused the growth of a mousehat overnight. The new plant sprout looked great because the area was previously empty.

Steve put the cereal bowls in the kitchen doorwedge by himself. The storage space was big enough to hold all the china.

The party host used a blender to mix each guest a deskdoor last night. The mixed beverages were a great treat after dessert.

The quarterback limped off the field after injuring his coldtown today. The joint in his leg is being examined to see if he can play.

Jen wanted a new look and went to a salon to fix her sinkpool today. A single braid of hair made her look elegant.

Sam collects shells like the stonecave on the beach. This type of shellfish is his favorite to look at.

Bob felt sick from last night and took medicine for his boatrope today.
The pain in his brain was getting worse.

Bruce’s house was dirty so he started cleaning the stewbar first. The covering on the floor was still fairly new.

The tale of the honorable and chivalrous mailtote was epic. The medieval soldier was a brave member of the aristocracy.

Blake inhales the flowers' unique sharpgate every year. The sweet smell reminds him of spring.

The collapse of the mine shaft injured a snailsoup yesterday. The mine worker was happy to make it out alive.

The new tree had snowflakes hanging from each flatstool last winter. Each thin branch drooped with the weight.

The exterminator sprayed to kill each lacebow once a month. These mold-dwelling parasites like to hide in damp, dark spaces.

Sandy stepped on a nail and punctured the oildish of her boot. The bottom of her shoe needs to be repaired.

The fast music signaled Kay and her partner to perform the wooddrum for the crowd. This challenging dance was met with applause.

Mike made salads with fresh yardstain for lunch. This crunchy vegetable is high in fiber when eaten raw.

The banquet table proudly featured a metalbead for all to see. The fine cheese serving bowl was a prized heirloom.

Gloria made a latch for the door of her cardsheet for safety. These types of shelter offer little other protection from burglars.

The gardener needed to trim the rapidly growing rooftile on the driveway. This type of grass has to be maintained very often.

The outlaw fired at the sheriff with his cookpan in great haste. The hidden firearm was strapped inside the outlaw’s boot.
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The fleas were everywhere and the dog suffered a ricesoap in the yard. These insect bites can be avoided by using special medicine.

In spring the flowers benefit from the mockcart from the sky. The light rain showers cover the ground like a thin layer of water.

Carrie liked to take her kids to play in the sheabalm on weekends. This park for children has a giant jungle gym and slide.

The bug collector put all his specimens in a furvest to keep. The insect container is designed for preservation.

Joe gets home-brewed corn whiskey from the pagewriter on Fridays. The alcohol maker has the cheapest prices in town.

The gambler played poker and won a meatcan just now. The cash prize winnings made a trip to the casino worthwhile.

John found a hole dug in his yard by the nightpaint this morning. These burrowing rodents can ruin a patch of land overnight.

Tim got his room key and gave his bags to the ripelime to handle. The hotel employee took care not to drop the heavy bags.

Everyone is raving about the number one hit squarevase this week. The huge media success is sure to be a classic.

Every summer the gardener picks a large, ripe sheepstaff off the vine. This round, juicy melon is a favorite seasonal fruit for many reasons.

The couple took off work and went on a(n) groundpole last week. They escaped on a fun trip which was well deserved.

Jane ate the ripe and juicy sweetfruit very slowly. It was a sweet fruit that she wanted to enjoy.
The quarterback limped off the field after injuring his leg joint today. The joint in his leg is being examined to see if he can play.

The fraternity sent out invitations to the big fake gale just now. The social gathering is sure to be festive and colorful.

The musician clanged the main shirt three times. The instrument added excitement to the concert.

The captain left the harbor on his silk robe this morning. This water craft was ready to be put to the test.

The harvester planted a lot of strings pool every year. This type of grain fed his entire family.

Tim sat under the shady branches of his art theft once a week. This type of tree was his favorite.

Matt has a new swagger to his jazz glove that is different. This manner of walking made him more confident.

The new king claimed his throne as the rightful coat belt after all. The deserving recipient was a born leader.

Ben received a Nobel Prize for his tooth gel in physics. This intellectual achievement was deserving of recognition.

Carol went to the fabric shop to buy slug trap earlier today. The soft material will make a good skirt.

The cobbler made holes in the leather with a sled race very carefully. This tool for leather had a sharp point.

Ann's seamstress made her a new heel strap for the party. The garment had never been worn in public before.

Perched in a tree this morning was a single weep tale looking around. This bird was looking for fish to catch.

The prey was stalked and killed by the soft sofa very quickly.
When the powerful animal pounced, it tore at the prey with its teeth.

The sportsman reeled in a record breaking mealtray this morning.  
The large fish is known for breaking fishing poles.

The pain in Jane's back was examined by the silverring yesterday.  
The vertebrae specialist ordered Jane to stay off of her feet.

Paul decided to brave the weather as he put on a thinscarf to go out in.  
The heavy jacket kept him from getting frostbite.

The astronomer spotted a radiant tinlink at midnight.  
The bright moon was a rare and brilliant sight.

The coffee shop is becoming famous for its fresh loudbark lately.  
The new coffee blend is a customer favorite.

The big game hunters went on a pearpeel this weekend.  
This buck hunting nature walk is a seasonal activity.

The new video technology being tested is the loanbill for consumers.  
This concave television provides a more realistic viewing experience.
Appendix F: Vocabulary Test Items

Bowcamp:
1) a glass dish
2) a flat doughy cake
3) a spoon
4) a foamy beer can

Pagewriter:
1) a car thief
2) a table
3) a chalkboard
4) a liquor maker

Baketeam:
1) a map
2) a network of computers
3) an encyclopedia
4) intimidation for cash gain

Meatcan:
1) a vacation
2) cash prize winnings
3) a long row of seats
4) a new car model

Cupshiner:
1) a surgeon
2) a film critic
3) a child care professional
4) a lawyer

Nightpaint:
1) a burrowing rodent
2) a miniature figurine
3) a road sign
4) a telephone pole

Yarnbox:
1) a spinning child’s toy
2) a basket
3) a bookshelf
4) a rack for art supplies

Ripelime:
1) a pair of slacks
2) a box of candies
3) a wind turbine
4) a hotel employee

Mousehat:
1) a piece of fabric
2) a motorcycle ramp
3) a road block
4) a new plant sprout

Cheesebowl:
1) a quilt
2) a huge media success
3) a felt hat
4) a picture frame

Doorwedge:
1) a magazine
2) construction equipment
3) a dishwasher
4) storage space

Sheepstaff:
1) a kite
2) a big umbrella
3) a small wind storm
4) a round juicy melon

Deskdoor:
1) a comfy chair
2) a cylinder of gas
3) a sandwich combination
4) a mixed beverage

Groundpole:
1) a bad punishment
2) a new job
3) a dance party
4) a fun trip

Coldtown:
1) a porcelain doll
2) a joint in the leg
3) a mountain bicycle
4) an electric vehicle

Sinkpool:
1) a piece of jewelry
2) a type of shoe
3) a braid of hair
4) a carnivorous insect

Barncart:
1) a river
2) a corn shucker
3) a toll road
4) a window

Boatrope:
1) a wristwatch
2) an unfortunate situation  
3) a helmet  
4) a pain in the brain

Blinklight:  
1) a farm animal  
2) a sea creature  
3) a sweet fruit  
4) a horseshoe

Stewbar:  
1) a type of nut  
2) a covering on the floor  
3) a toolbox  
4) a fenced in property

Stonecave:  
1) a type of bread  
2) a bottle  
3) a hair accessory  
4) a type of shellfish

Fakegale:  
1) a type of tree  
2) a book  
3) a piece of paper  
4) a social gathering

Mailtote:  
1) a dog  
2) a criminal  
3) a medieval soldier  
4) a child

Mainshirt:
1) a type of profession
2) a baby animal
3) a piece of furniture
4) an instrument

Sharpgate:
1) a household appliance
2) an iron welder
3) an engraving
4) a sweet smell

Silkrobe:
1) a remote control
2) a water craft
3) a type of building
4) a radio

Kiwisoup:
1) a doctor
2) an Olympic athlete
3) a movie actress
4) a mine worker

Stringspool:
1) a plant that produces fruit
2) a sour candy
3) a type of grain
4) a type of flower

Snailshell:
1) a bunch of keys
2) an herbal ingredient
3) a type of chocolate
4) an ancient artifact
Arttheft:
1) an amusement park
2) a type of rodent
3) a type of tree
4) a type of vehicle

Flatstool:
1) a form of architecture
2) a body part
3) a thin branch
4) a baseball bat

Jazzglove:
1) a body of water
2) a manner of walking
3) a power tool
4) a surgical procedure

Lacebow:
1) a type of mushroom
2) a mold-dwelling parasite
3) an airplane
4) a breed of horse

Coatbelt:
1) a circus entertainer
2) a symphony conductor
3) a police officer
4) a deserving recipient

Oildish:
1) a woven cloth
2) a racecar
3) a shoe sole
4) a military tank
Toothgel:
1) an art museum
2) a medium of entertainment
3) an intellectual achievement
4) a Russian ballet

Wooddrum:
1) a type of board game
2) an Italian opera
3) a challenging dance
4) a professional camera

Slugtrap:
1) a poisonous chemical
2) a rug or carpet
3) an oil painting
4) a soft material

Yardstain:
1) a house pet
2) an article of clothing
3) a crunchy vegetable
4) a type of metal

Sledrace:
1) an oven mitt
2) a video camera
3) a tool for leather
4) a paint brush

Metalbead:
1) an expensive vacation
2) a place of worship
3) a fountain pen
4) a fine cheese serving bowl
Heelstrap:
1) a set of curtains
2) a garment
3) a pair of eyeglasses
4) a large purse

Cardsheet:
1) a notebook computer
2) a rolling suitcase
3) a type of shelter
4) a brass telescope

Weeptale:
1) a small bridge
2) a praying mantis
3) a bird
4) heavy duty machinery

Rooftile:
1) a fluffy towel
2) a type of grass
3) a piece of pottery
4) a feather duster

Softsofa:
1) a type of sport
2) a pickup truck
3) a tape measure
4) a powerful animal

Cookpan:
1) a pair of scissors
2) a writing utensil
3) a thermometer
4) a hidden firearm
Mealtray:
1) a type of cookware
2) an embroidery hoop
3) a large fish
4) a frozen drink

Clothhook:
1) an antique desk
2) a set of wind chimes
3) head ware
4) a bicycle bell

Silverring:
1) a football helmet
2) a vertebrae specialist
3) a can opener
4) a crystal chandelier

Tinychain:
1) a laundry detergent
2) a hot drink
3) a brand of honey
4) an acoustic guitar

Thinscarf:
1) an outdoor grill
2) a plastic yo-yo
3) a brand of batteries
4) a heavy jacket

Ricesoap:
1) a bottle of wine
2) a mathematical equation
3) an insect bite
4) a thesaurus
Tinlink:
1) a movie poster
2) a laser pointer
3) a brand of perfume
4) a bright moon

Mockcart:
1) a light rain shower
2) a dictionary
3) a long dress
4) a cosmetic product

Loudbark:
1) a new coffee blend
2) a brand of ice cream
3) a Polish sausage
4) a world globe

Sheabalm:
1) a spool of thread
2) a farm
3) a park for children
4) a bowtie

Pearpeel:
1) a buck hunting nature walk
2) a frying skillet
3) a summer breeze
4) a silo for grain

Furvest:
1) an oval mirror
2) an insect container
3) a toaster
4) a clarinet reed
Loanbill:
1) a pair of running shoes
2) a concave television
3) a dry erase marker
4) a flash light