Factors affecting the activation of predictive inferences

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FACTORS AFFECTING THE ACTIVATION OF PREDICTIVE INFERENCES

BY

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B.A., Fort Lewis College, 1999

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Dissertation

Submitted to the University of New Hampshire

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in

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April 22, 2005
Date
DEDICATION

In memory of Stella R. Arambel.
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# TABLE OF CONTENTS

DEDICATION............................................................................................................ iii  
ACKNOWLEDGMENTS.............................................................................................. iv  
LIST OF TABLES...................................................................................................... vii  
ABSTRACT................................................................................................................ viii

<table>
<thead>
<tr>
<th>CHAPTER</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>I. MODELS OF DISCOURSE COMPREHENSION</td>
<td>4</td>
</tr>
<tr>
<td>Constructionist Model</td>
<td>5</td>
</tr>
<tr>
<td>Memory-based Text Processing</td>
<td>7</td>
</tr>
<tr>
<td>II. FACTORS INFLUENCING MEMORY RETRIEVAL</td>
<td>11</td>
</tr>
<tr>
<td>III. PREDICTIVE INFERENCEs</td>
<td>21</td>
</tr>
<tr>
<td>IV. EXPERIMENTS</td>
<td>34</td>
</tr>
<tr>
<td>Experiment 1</td>
<td>34</td>
</tr>
<tr>
<td>Experiment 2</td>
<td>41</td>
</tr>
<tr>
<td>Experiment 2A</td>
<td>41</td>
</tr>
<tr>
<td>Experiment 2B</td>
<td>44</td>
</tr>
<tr>
<td>Experiment 3</td>
<td>47</td>
</tr>
</tbody>
</table>
Experiment 4 .................................................. 54
Experiment 5 .................................................. 58
V. GENERAL DISCUSSION ........................................ 63
LIST OF REFERENCES ........................................... 68

APPENDICES

Appendix A. Sample Passages from Experiment 1 and Experiment 2A .... 74
Appendix B. Responses from Experiment 2A ........................................... 98
Appendix C. Sample Passages from Experiment 2B .................................... 101
Appendix D. Sample Passages from Experiment 3 ..................................... 110
Appendix E. Sample Passages from Experiments 4 and 5 ......................... 128
Appendix F. IRB Approval ........................................................................ 152
LIST OF TABLES

Table 1. Sample passage from Albrecht and O'Brien (1993) .........................13
Table 2. Example passage used by O'Brien et al. (1990) ...............................16
Table 3. Sample Passage from Rizzella & O'Brien (1996) ..............................17
Table 4. Sample Passage used by O'Brien and Albrecht (1991) .......................19
Table 5. Example Passage from Cook et al. (2001) ......................................25
Table 6. Sample passage from Peracchi & O'Brien (2005) ............................26
Table 7. Sample Passage from Experiment 1 ...........................................35
Table 8. Mean Naming Times from Experiment 1 .......................................39
Table 9. Mean Naming Times (msec) for Passages with Emotionally Salient Distractors .................................................................40
Table 10. Sample Passage from Experiment 2A/B .......................................42
Table 11. Mean Naming Time on Distractor Probe for Experiment 2B ............45
Table 12. Sample Passage from Experiment 3 ...........................................49
Table 13. Mean Reading (msec) Times for Experiment 3 ..............................51
Table 14. Sample Passage from Experiment 4 ...........................................55
Table 15. Mean Naming Times for Experiment 4 .......................................58
Table 16. Sample Passage from Experiment 5 ...........................................60
Table 17. Mean naming times from Experiment 5 .....................................61
Table 18. Mean naming times for 16 passages from Experiment 5 in unrelated distractor .................................................................62
ABSTRACT

FACTORS AFFECTING THE ACTIVATION OF PREDICTIVE INFERENCES

by

Mary E. Harmon

University of New Hampshire, May, 2005

Past research has demonstrated that predictive inferences are difficult to detect when distracting material is present (Klin, Guzman, & Levine, 1999b). The experiments in this dissertation were designed to explore both how and why distracting material influences the availability of predictive inferences.

Participants were presented with passages containing either a neutral introduction or a distractor introduction followed by an inference-evoking sentence or a control sentence. In Experiment 1, activation of predictive inferences was detected with a naming task, but not in the presence of distracting information. In Experiments 2 and 3, there was no evidence of activation of a “distractor” inference when using either a naming or reading task. In Experiment 4, there was evidence of activation of predictive inferences when the amount of distracting information was reduced, suggesting that elaboration of distracting material interferes with the ability to detect activation of predictive inferences. Finally, the results from Experiment 5 indicated that it is only related distracting information the interferes with activation of predictive inferences. The results are interpreted within the memory-based view of text processing and the resonance model.
INTRODUCTION

Although understanding a written message appears simple enough, the process involves much more than merely interpreting the meaning of words on a page. One requirement of text comprehension is that readers go beyond what is explicitly stated in the text. In other words, comprehending discourse requires the use of general world knowledge so that inferences may be drawn in order to “fill in” or bridge any gaps left by the writer. Thus, both the explicitly stated information and their general world knowledge must be utilized in order to come away with a complete understanding of the intended message.

Although some inferences are necessary for text comprehension, other inferences, such as predictive inferences simply embellish the explicitly stated information. For example, reading the sentence, “No longer able to control his anger, Steven threw a delicate porcelain vase against the wall,” may result in the activation of something consistent with the idea “break.” However, this activation isn’t necessary to understand the meaning of the sentence. Most research has suggested that such inferences do become activated. More recent work has been devoted to investigating the conditions under which predictive inferences occur. For example, Klin, Guzman, and Levine (1999b) demonstrated that when there is the possibility of a second inference, the primary inference is not detected with a naming task. The goal of this dissertation is to further explore how multiple inferences influence discourse comprehension. In the sections that
follow, the factors that influence inferential processing and the theories that can account for such findings will be reviewed.

There are many theories that attempt to describe the process of reading written discourse (e.g., Graesser, Singer, & Trabasso, 1994; McKoon & Ratcliff, 1992; van Dijk & Kintsch, 1988; Zwann & Radvansky, 1998). However, currently there are two competing perspectives of discourse processing: the memory-based view and the explanation-based view. These two theories will be discussed in Chapter 1. These theories will offer a framework within which the findings regarding the activation of inferences will be interpreted.

The amount of elaboration that supports an inference is an important factor in detecting inference activation. This is true for all types of inferences. For example, O'Brien, Plewes, & Albrecht (1990) found that when an antecedent is elaborated, it can become activated more quickly than a non-elaborated antecedent, even when the non-elaborated antecedent is more recently mentioned. It is also possible for more than one inference to become activated during reading. For instance, Corbett (1984) found that reading times on an anaphoric noun phrase were slower when more than one possible antecedent was stated in the text. This work suggested that both antecedents became activated, resulting in interference. In Chapter 2, I will discuss how elaboration influences the activation of inferences.

Chapter 3 will describe how elaboration and the presence of distractor information may influence the activation of predictive inferences. I will discuss a series of experiments designed to manipulate factors within the text, such as number of possible
inferences and elaboration, that may influence the activation of predictive inferences in Chapter 4. The results will be reviewed in the General Discussion.
CHAPTER I

MODELS OF DISCOURSE COMPREHENSION

An essential component of reading comprehension is that incoming information makes contact with the developing representation of the text in memory. At best, text is written in such a way that renders this process seemingly effortless; ideas flow easily, from one to the next, so that incoming information in working memory easily connects with previous portions of the text stored in long-term memory. However, even the most well-written text requires the use of a reader's general knowledge in order to gain a complete understanding of the intended message. In other words, inferences must be made based on information from the text and from readers' general knowledge base. Therefore, one goal of discourse processing is to investigate how and when inferences are made during reading.

Currently there are two opposing theories of discourse comprehension: the explanation-based and the memory-based views. Both theories acknowledge the fact that incoming textual information makes contact and is integrated with the text representation in memory. In addition, both theories recognize the activation of inferences during reading. However, the theories differ regarding how inferences become activated and the conditions under which inferential activation occurs. There is general agreement that inferences necessary for comprehension, such as bridging inferences (Clark & Sengul, 1979; Haviland & Clark, 1974; Keenan, Potts, Golding, & Jennings, 1990; McKoon &
Ratcliff, 1990; Sanford, 1990), anaphoric inferences (McKoon & Ratcliff, 1980; O’Brien, Duffy, & Myers, 1986), and causal inferences (Keenan, Baillet, & Brown, 1984; Myers & Duffy, 1990; Myers, Shinjo, & Duffy, 1987; Rizzella & O’Brien, 1996) become activated during normal reading. However, there is less agreement regarding the activation of elaborative inferences; or inferences that are not required for comprehension, but merely extend or enrich the text. Therefore, considerable effort has been put forth to investigate elaborative inference processing (Garrod, O’Brien, Morris, and Rayner, 1990; Harmon & O’Brien, in prep; McKoon and Ratcliff, 1989; O’Brien & Albrecht, 1991; O’Brien, Shank, Myers, and Rayner, 1988; Peracchi & O’Brien, 2004). Much of this research has focused on a specific type of elaborative inference, known as a predictive inference. A predictive inference is one that involves predicting future events or consequences of a text, or a “what happens next” inference. Although both the explanation-based and memory-based theories predict the occurrence of those inferences, they differ in regards to the process by which inferences become available. The following section describes the two views of discourse processing and how each theory explains text processing, including the activation of inferences.

Constructionist Model

The explanation-based, or constructionist theory is grounded in the belief that reading involves an active search for meaning. This search-for-meaning principle is based on three assumptions: that meaning is constructed by readers’ goals, that both local and global coherence are maintained during reading, and that readers actively search for
an explanation as to why actions, events, and states occur in the text. Therefore, this theory postulates that readers are active processors and constantly attempt to construct meaning from text (Graesser Singer, & Trabasso, 1994; Singer, Graesser, & Trabasso, 1994).

In order to satisfy the assumptions of the search after meaning principle, readers must activate certain inferences, as not every detail is explicitly stated in the text. The constructionists predict six classes of inferences that occur on-line under most processing conditions. These inferences are separated into two broad categories: those needed to maintain local coherence and those needed to maintain global coherence. The inferences required to establish and maintain local coherence include referential inferences, case structure role assignment inferences, and causal antecedent inferences. The relevant inferences for maintaining global coherence include superordinate goals, thematic ideas, and character's emotional reaction. The constructionist view also recognizes the activation elaborative inferences. These are known as elaborative inferences, which include causal consequences (i.e., predictive inferences), instantiations of noun categories, instruments, subordinate goals/actions, and states. However, these types of inferences will only become activated when they receive strong activation from multiple information sources and are highly constrained by the text (Graesser et al., 1994; Singer et al., 1994). Thus, within the explanation-based view, predictive inferences should only become available when the context is highly supportive of the predictive event. This hypothesis is supported in by empirical results (Duffy, 1986; Keefe & McDaniel, 1993; Potts, Keenan, & Golding, 1988; Calvo & Castillo, 1996; Calvo, Castillo, & Estevez,
1999; Cook, Limber, & O'Brien, 2001; Fincher-Kiefer, 1995, 1996; Murray, Klin, & Myers, 1993; Klin, Guzman, & Levine, 1999; Klin, Murray, Levine, & Guzman, 1999), although the hypothesis itself cannot accurately predict when the context is sufficiently constraining, or the process by which the inference becomes activated.

**Memory-based Text Processing**

In contrast to the constructionist view, the memory-based view of text processing claims information becomes available to the reader through a more passive process (McKoon, Gerrig, & Greene, 1996; McKoon and Ratcliff, 1995). According to this perspective, active concepts in working memory send a signal to all information in long-term memory. Information in long-term memory that shares many features with that signal is in turn activated (Ratcliff, 1978). The degree to which that information is activated depends on the amount of conceptual overlap it shares with the signal. This process allows information to be accessed automatically and quickly from general world knowledge and from the representation of the text in memory.

Myers and O'Brien (1998) developed the resonance model to explain how newly encoded information makes contact with contents stored in long-term memory without invoking an active search process. The basic assumption of this model is that incoming concepts or propositions in working memory send a signal to all of memory. Concepts from the text representation as well as the reader's background knowledge resonate to that signal according to the degree of overlap of semantic and contextual features. The items in memory which are initially activated, in turn send a signal to other items in
memory and to the original source of activation. Activation eventually stabilizes by a
damping mechanism, and items that resonate sufficiently become part of working
memory.

There are two important features of the resonance process. The first is that the
process is continual, meaning there is a continuous signal being sent to all of memory.
The signal changes depending on what is active in working memory, thus the items that
are activated in long-term memory are also constantly changing. The second feature is
that the process is dumb. Items that resonate sufficiently are incorporated in the active
portion of working memory whether that information will help or hinder comprehension.

The notion that information from previous portions of the text and from general
world knowledge can be activated through a passive resonance process can account for
different types of inferences, including both necessary and elaborative inferences. The
only constraint on inferential processing within the resonance model is that the
information must be easily available. The accessibility of any concept in memory
depends upon the amount of overlap between that information, and the signal being sent
to all of memory. If there is not sufficient overlap, the information does not reach a
sufficient level of activation to become part of working memory.

In the case of necessary inferences such as bridging inferences, anaphoric
inferences and causal bridging inferences, the information can be accessed through a
passive activation of pre-existing knowledge (Cook et al., 2001; also see O’Brien &
Myers, 1999). Consider the following sentence pair from Haviland and Clark (1974):
“We got some beer out of the trunk. The beer was warm.” In this example the beer
mentioned in the first sentence serves as the antecedent to the beer described in the second sentence. Now consider a second sentence pair: "We checked the picnic supplies. The beer was warm." In this example, the picnic supplies do not serve as a direct antecedent to the beer mentioned in the second sentence. The information in these two sentences must somehow be connected to generate a coherent representation of the text. It is assumed that a bridging inference is constructed representing the idea that the beer is part of the picnic supplies. Haviland and Clark (1974) provided evidence that a bridging inference was activated as reading times for the second sentence (e.g., The beer was warm) were longer when preceded by a sentence without a direct antecedent (e.g., picnic supplies) than with a sentence containing a direct antecedent (e.g., beer).

According to the resonance model, when reading about "beer," a signal is sent to all of memory and any concepts or propositions that share features with that concept will resonate in response. The concept "picnic supplies" shares conceptual features with "beer" and would likely become active in memory, and subsequently connected with "beer."

In the case of elaborative inferences, a strong biasing context results in the passive activation of semantic and contextual information from earlier portions of the text and from general world knowledge, converging upon inferential information (Cook et al., 2001). Cook et al. (2001) found that after reading an inference-evoking sentence, participants named the predictive concept significantly faster in a high context condition compared to a low context condition, indicating that predictive inferences become activated during reading. These results can be explained with the memory-based view of
text processing and the resonance model proposed by Myers & O'Brien (1998). When the inference evoking sentence was encoded, a signal was sent to all of memory, including general world knowledge. Contextual information in the text representation would resonate and in turn would send a signal to all of memory, again including general world knowledge. The combination of the signal to general world knowledge from the context and the inference-evoking sentence would converge on the information in common with both, specifically the predictive inference.

Understanding these two theories offers a framework which can be used to conceptualize the findings on inferences. In what follows I will review the work on inferences, including the conditions under which inferential processing occurs and the role they play in discourse comprehension. All findings will be interpreted within the memory-based view of reading comprehension.
CHAPTER II

FACTORS INFLUENCING MEMORY RETRIEVAL

Part of the process of generating a coherent representation of a text requires connections to be made between incoming information and information stored in memory. However, there are times when the current information refers to events from the text that are no longer active in memory or that requires access to a reader's general world knowledge. In such cases, a search must be conducted in which inactive portions of memory must be accessed and returned to the active portion of working memory. Based on the assumptions of the resonance model, information can only be accessed to the extent that it shares contextual and semantic features with the current signal. Elaborating a concept increases the number of features shared between that concept and the signal. Also, elaboration results in more retrieval routes to that concept, increasing the speed with which that information can be reactivated. However, according to the resonance model, elaboration only facilitates retrieval speed to the extent that the elaborated information shares features with the current signal. Therefore, elaborated information will only become reactivated when there is feature overlap between the signal emanating from working memory and the elaborated concept. Another important assumption is that all information that shares features with the signal will resonate in response. This means that information that is irrelevant or distracting to the understanding of the text can become active in working memory, despite the fact that it may hinder comprehension. In
what follows I will describe a variety of studies that investigated the influence of elaboration and distracting information on text retrieval. The findings will be discussed within the memory-based view of text processing.

Under the assumptions of the resonance model, elaboration increases activation of information, even if that information is no longer active in working memory (Albrecht & Myers, 1995; Albrecht & Myers, 1998; Albrecht & O'Brien, 1993; Albrecht & O'Brien, 1991; Cook, Halleran, & O'Brien, 1998; Gueraud, Harmon, & Peracchi, in press; Myers, O'Brien, Albrecht, & Mason, 1994; O'Brien & Albrecht, 1992; O'Brien, Rizzella, Albrecht, & Halleran, 1998; Rizzella & O'Brien, 2002). Albrecht & O'Brien (1993) found this even also true for global information that had been backgrounded. They presented subjects with passages such as the one presented in Table 1. Each passage contained a description of the protagonist (e.g., describing Mary's food preferences). This was followed by a filler section, designed to background the character description while still maintaining local coherence. A target sentence was then presented (e.g., Mary ordered a cheeseburger and fries) in which the protagonist performed an action that was either consistent, inconsistent, or neutral in regards to the original description of the character. Reading times were longer in the inconsistent condition than the consistent or neutral conditions, suggesting that the inconsistent information became reactivated and interfered with comprehension. These results are accounted for by the resonance model. When readers encounter the target sentence which stated, “Mary ordered a cheeseburger and fries,” a signal was sent to all of memory. Any information that shared contextual or semantic features with that signal, in this case, the description of Mary’s eating habits,
resonated in response to that signal. A slowdown in reading resulted in the inconsistent condition when readers received the information that Mary was a vegetarian and a global coherence break occurred.

**Table 1. Sample passage from Albrecht and O’Brien (1993)**

**Introduction:**
Today, Mary was meeting a friend for lunch. She arrived early at the restaurant and decided to get a table. After she sat down, she started looking at the menu.

**Consistent Elaboration:**
This was Mary’s favorite restaurant because it had fantastic junk food. Mary enjoyed eating anything that was quick and easy to fix. In fact, she ate at McDonalds at least three times a week. Mary never worried about her diet and saw no reason to eat nutritious foods.

**Inconsistent Elaboration:**
This was Mary’s favorite restaurant because it had fantastic health food. Mary, a health nut, had been a strict vegetarian for 10 years. Her favorite food was cauliflower. Mary was so serious about her diet that she refused to eat anything that was fried or cooked in grease.

**Neutral Elaboration:**
This was Mary’s favorite restaurant because it has a nice quiet atmosphere. Mary frequently ate at the restaurant and had recommended it to all of her friends. She especially liked the cute tables and the country style cloths on them. It made her feel right at home.

**Filler:**
After about 10 minutes, Mary’s friend Joan arrived. It had been a few months since they had seen each other. Because of this Mary and Joan had a lot to talk about and chatted for over a half hour. Finally, the signaled the waiter to come take their orders. They checked the menu one more time. Mary and Joan had a hard time deciding what to have for lunch.

**Critical Sentences:**
Mary ordered a cheeseburger and fries. She handed the menu back to the waiter.

**Closing:**
Her friend didn’t have as much trouble deciding what she wanted. She ordered and they began to chat. They didn’t realize there was so much for them to catch up on.

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It has been shown that elaboration on backgrounded concepts continues to influence retrieval even when that information is outdated, and thus, irrelevant (Albrecht...
& O'Brien, 1993; Cook, Halleran, & O'Brien, 1998; Gueraud, Harmon, & Peracchi, in press; O'Brien, Rizzella, Albrecht, & Halleran, 1998). Using the same materials described above, O'Brien et al. (1998) added a qualified elaboration section in which the original description of the character was not true (e.g., Mary used to be a vegetarian, but she wasn’t anymore). Reading times for target sentences with this qualification were again longer, indicating that the outdated information (e.g., vegetarian) had become activated. Gueraud, Harmon, & Peracchi (in press) extended upon this finding. They found that when there was an equal amount of inconsistent and consistent information in the qualified condition, reading times on the target sentences were not slowed. However, in a subsequent study subjects responded more quickly to a probe word representing the inconsistent information (e.g., vegetarian) after reading the contradictory sentence in the qualified condition. These experiments showed that with additional elaboration on consistent information, there was no longer integration difficulties when encountering the critical sentences. However, that consistent information doesn’t eliminate activation of the outdated, inconsistent information.

In the studies described above, elaboration consisted of a few sentences containing a great deal of information about the target concept. However, elaboration need not include multiple references or additional concepts to influence reactivation (O’Brien, Shank, Garrod, & Myers, 1988). Albrecht & Myers (1998) found that by simply including an adjective modifier to elaborate a backgrounded antecedent, the speed with which the information was subsequently reactivated was facilitated. Therefore, even a small amount of elaboration increases the likelihood that a target concept will become
reactivated.

The impact of irrelevant or distracting information on memory retrieval has also been demonstrated with research on antecedent retrieval (Corbett, 1984; O’Brien, 1987; O’Brien, Albrecht, Hakala, & Rizzella, 1995; O’Brien, Plewes, & Albrecht, 1990). For instance, Corbett (1984) presented passages in which half contained an antecedent paired with a modifying adjective (e.g., frozen peas) and the other half which included the original antecedent and a non-antecedent from the same category, paired with a different adjective (e.g., fresh corn). He found that reading times on a target sentence containing a category reference (e.g., frozen vegetables) were longer for passages containing the non-antecedent. However, when the non-antecedent was a low typical member of the anaphoric category, reading times did not increase. This study suggested that the mention of an exemplar from the same category caused interference upon reading the anaphoric sentence. However, this is only the case when both exemplars share a large number of features with the anaphoric category.

O’Brien et al. (1990; 1995) also conducted series of studies examining the influence of multiple antecedents on antecedent retrieval. They presented passages that contained two potential antecedents: One occurring early in the passage and one occurring late in the passage. One antecedent was elaborated whereas the other was only mentioned briefly. Thus, their study differed from the one conducted by Corbett (1984) in that they manipulated elaboration and distance, in addition to the number of antecedents. Consider the sample passage presented in Table 2. In this example, the early antecedent (e.g., train) is elaborated while the late antecedent (e.g., plane) is briefly
mentioned. The final sentence in the passage prompted reinstatement of one of the two potential antecedents (e.g., Mark’s neighbor asked him how he had traveled to his parents’). O’Brien et al. (1990) found that the elaborated antecedent (e.g., train) was retrieved more quickly than the unelaborated, but more recent antecedents (e.g., plane). Thus, the amount of elaboration has the potential to override recency effects (O’Brien & Myers, 1999).

Table 2. Example passage used by O’Brien et al. (1990).

Mark had grown up in the city but he had always wanted to live in the country. The first chance he got, he bought some land and moved there. It made him very happy not having to live in the crowded and noisy city. On holidays, he would travel by train into the city to visit his parents. While riding in it he liked to watch the countryside as it raced past him. Sometimes, the clackety clack it made on the tracks would put him to sleep. He’d wake up quickly though when they came to a crossing and it sounded the horn. Mark couldn’t understand why people like his parents preferred to live in the city. Mark really enjoyed living in the country. He loved all the open spaces and the clean fresh air. His brother had also moved out of the city and was now living in Colorado. Last summer Mark had traveled by plane to visit him. He had loved looking down from it at the countryside and the clouds. Ever since Mark had moved to the country he made a lot of friends. On Saturdays, he played golf with his neighbor. On the weekends, their families would get together for cookouts. One weekend they’d eat at Mark’s and the next they would eat at his neighbor’s. One night while they were talking, Mark’s neighbor asked him how he had traveled to his parents’.

Similar effects can be found when there is more than one potential causal antecedent. For example, Rizzella & O’Brien (1996) presented passages such as the one presented in Table 3. Note that the last line of the passage (e.g., He knew that once his father came home he would be in trouble) provided a causal consequence for which there were two potential causal antecedents: Billy being irresponsible and Billy breaking the window. Rizzella & O’Brien (1996) found that when the more distant antecedent (e.g.,
irresponsible) was elaborated, the information was reactivated more quickly, even when the immediately preceding context offered a sufficient causal antecedent.

Table 3. Sample Passage from Rizzella & O'Brien (1996)

---

Billy was walking home from school after playing a game of basketball. Billy looked for his keys to unlock the front door of his house. He searched everywhere but couldn’t find the keys. He realized there was a big hole in his pocket. Now, he had no idea where to look. Billy shuddered when he recalled the warning his father gave him about being more responsible. His father told him that if he was not more responsible, he would ground Billy for an entire month. Billy needed to find another way to unlock the door. Billy broke a small window. The window fell to pieces on the ground. He knew that once his father came home he would be in trouble.

The results described above can easily be explained within the memory-based view. According to the resonance model, when an anaphoric phrase is encountered by the reader, a signal is sent to all of memory and potential antecedents resonate in response. The potential antecedent that shares the greatest number of features with the anaphor will resonate the most and have the highest likelihood of being selected (e.g., Albrecht & O'Brien, 1993; Cook, O'Brien Peracchi, & Myers, under review; Garrod, O'Brien, Morris, & Rayner, 1990; Gernsbacher, 1989, 1990; O'Brien, 1987; O'Brien, 1995; O'Brien & Albrecht, 1992; O'Brien, Albrecht, Hakala, & Rizzella, 1995; O'Brien, Plewes, & Albrecht, 1990). Elaboration influences antecedent retrieval because elaborating on a concept increases the number of retrieval routes to that antecedent, thus increasing the speed with which the antecedent will be reactivated.

Finally, Albrecht and Myers (1998) provided evidence that resonance is reduced when a signal encounters closely related concepts in a discourse. For example, they presented text which contained two episodes: a goal setting episode followed by a neutral
episode. An object (e.g., desk) was mentioned in either the goal-setting episode or both the goal setting and neutral episodes. They found when the object was only mentioned in the goal-setting episode, subsequent mention that object served to reactivate the information contained in goal episode. However, when the object was present in both episodes, the effectiveness of the object in reactivating the original goal setting episode was reduced. This demonstrated that when the object was present in both episodes, subsequent mention of the object resulted in the reactivation of both the goal-setting and neutral episodes, resulting in interference between the two.

In addition to increasing the likelihood of activation of previous portions of the text, elaboration also influences the activation of inferences (O'Brien & Albrecht, 1991; Rizzella & O'Brien, 1996). For example, O'Brien & Albrecht (1991) demonstrated that with sufficient elaboration an antecedent was inferred, even when an appropriate antecedent was explicitly stated in the text. They presented participants with passages that contained either a high or low context supporting one of two target antecedents (see Table 4 for sample passage). In the high-context version, the elaboration was highly supportive of one antecedent, in this case the context is highly supportive of “skunk.” The target antecedent was either consistent with the context (e.g., skunk) or unrelated (e.g., cat) to the context. In the low-context version, the elaboration was equally supportive of either antecedent. The final line of the passage prompted reinstatement of an antecedent.
Table 4. Sample Passage used by O’Brien and Albrecht (1991)

**High-context version**
Mary was driving in the country one day when she smelled a terrific odor. Suddenly a small black (*skunk/cat*) with a white stripe down its back ran in front of the car. Mary knew she couldn’t stop in time. However, she hoped she had managed to miss the animal and continued on her way. After a while, she noticed she was low on gas. While at the gas station, the attendant asked her what had run in front of her car.

**Low-context version**
Mary was driving in the country one day and she gazed at the setting sun as she went. Suddenly a small black (*skunk/cat*) with a long furry tail ran in front of the car. Mary knew she couldn’t stop in time. However, she hoped she had managed to miss the animal and continued on her way. After a while, she noticed she was low on gas. While at the gas station, the attendant asked her what had run in front of her car.

O’Brien and Albrecht (1991) found that naming times for skunk were faster in the high context version, even when “cat” had been explicitly stated. In other words “skunk” was activated in the high-context version even when “cat” was the target antecedent. In contrast, naming times for the unstated antecedent (e.g., skunk) were not faster in the low context version. According to the resonance model, the activation of “skunk” following the high context occurred because activation spread from concepts directly mentioned in the passage to semantically related concepts from the reader’s general world knowledge. For example, the passage contained concepts related to “skunk,” although “skunk” was not explicitly stated in the text. Therefore, activation spread from those concepts to the concept “skunk” in semantic memory. The sum of the activation from these concepts to “skunk” was sufficient to raise the activation of “skunk” to a detectable level. Upon reading the final sentence, those concepts would become reactivated and “skunk” was inferred instead of the correct antecedent “cat.” In the low context version, the amount
of information semantically related to “skunk” was insufficient to raise the activation of that concept to a detectable level. Therefore, upon reading the target sentence the correct antecedent “cat” was reinstated.

If factors such as elaboration and the number of distractors can affect how quickly backgrounded information is retrieved, they may also play a role in the activation of predictive inferences. This is especially true in cases when the contextual information supporting the inferences is backgrounded. The influence of elaboration and distracting information on the activation of predictive inferences will be discussed in the next chapter.
CHAPTER III

PREDICTIVE INFERENCE

According to the resonance model, information in working-memory and long-term memory resonates to the extent that it shares features with the signal emanating from working memory. This occurs regardless of whether that information is backrounded, part of the text representation, or part of general world knowledge. Furthermore, factors such as elaboration and distracting information influence the speed of reactivation of concepts in memory and the ability to detect activation. It must be the case that the processes involved in text retrieval also underlie the activation of inferences. In this chapter, I will discuss factors affecting the activation of predictive inferences and how inferential processing is conceived within the memory-based view of text processing.

There is general agreement that inferences necessary for comprehension, such as bridging inferences (Clark & Sengul, 1979; Haviland & Clark, 1974; Keenan, Potts, Golding, & Jennings, 1990; McKoon & Ratcliff, 1990; Sanford, 1990), anaphoric inferences (McKoon & Ratcliff, 1980; O'Brien, Duffy, & Myers, 1986), and causal inferences (Keenan, Baillet, & Brown, 1984; Myers & Duffy, 1990; Myers, Shinjo, & Duffy, 1987; Rizzella & O'Brien, 1996) become activated during normal reading. However, there is less agreement regarding the activation of elaborative inferences, or inferences that embellish the text but are not necessary for comprehension. Considerable effort has been invested to increase our understanding of the conditions under which
elaborative inferences become activated and how they are represented in memory. Much of this research has focused on a specific type of elaborative inference, known as a predictive inference. Predictive inferences are inferences about future events in a text. For instance, when reading about a delicate porcelain vase being thrown against the wall, the idea "break" may be inferred.

Early studies suggested that predictive inferences were not automatically activated during normal reading situations (Duffy, 1986; Potts, Keenan, & Golding, 1988; Singer & Ferreira, 1983), or at best, such inferences were "minimally encoded" (McKoon & Ratcliff, 1986). For example, Potts et al. (1988) found that naming time on a target probe was facilitated when the probe concept was required for coherence, but showed no facilitation after a predictive context. In contrast when subjects read the same sentences in which some letters were deleted from the words, naming times were facilitated following the predictive context. Potts et al. (1988) argued that predictive inferences are not activated unless required for coherence or during more strategic processing.

However, subsequent research suggested that the failure of Potts et al. (1988) to detect activation of predictive inferences during normal reading could be due to various methodological factors (Keefe & McDaniel, 1993; Murray, Klin, & Myers, 1993). Keefe & McDaniel (1993) hypothesized that Potts et al. (1988) failed to detect the predictive inference because the probe did not immediately follow the predictive context. Keefe & McDaniel (1993) presented participants with sentences such as, "After standing through the three-hour debate, the tired speaker walked over to his chair." Either immediately following these sentences or after one intervening sentence, subjects were presented with
the predicted concept (e.g., sat) or a control word and were instructed to name the word aloud. Naming times on the predicted concept were significantly faster than the control word, suggesting the inference had been activated. However, this facilitation was only observed when the probe was presented immediately after the contextual information. Keefe & McDaniel (1993) concluded that predictive inferences are activated, but rapidly decay with delay.

A similar experiment was conducted by Murray et al. (1993). They presented passages that contained several text characteristics which would increase the probability that a predictive inference would become activated. The passages were similar to the following example:

Carol was fed up with her job waiting on tables. Customers were rude, the chef was impossibly demanding, and the manager had made a pass at her just that day. The last straw came when a rude man at one of her tables complained that the spaghetti she had just served was cold. Without thinking of the consequences, she picked up the plate of spaghetti, and raised it above the rude man’s head.

Notice that the elaboration in this passage is highly supportive of the predictive concept “dump.” Furthermore, the authors controlled for lexical associates of the target concept, thus avoiding activation due to lexical priming. Using a naming task they found that reaction times were faster in the predictive condition compared to a control condition. Murray et al. (1993) concluded that predictive inferences are activated when supported by contextual information contained in the text, even when no lexical associates are presented in the passage.

Subsequent research has supported the finding that the degree of contextual
support is important in detecting activation of predictive inferences (Calvo, 2000; Cook et al, 2001; Klin, Murray, Levine, & Guzman, 1999a; Peracchi & O’Brien, 2005). Cook et al (2001) presented passages containing either high contextual support (e.g., throwing rocks at a target) or low contextual support (e.g., throwing nerf balls at a target) in relation to the target event (see Table 5 for a sample passage). This contextual information was followed by a short backgrounding section. A target sentence was then presented that directly referenced the predicted event (e.g., He missed, though, and he accidentally hit the door of a new car). They found that naming times for the target probe were faster in the high context condition than the low context condition, indicating that the predictive inference had become activated. These results differ from previous research in that the contextual information was followed by a backgrounding section. Thus, they detected activation of predictive inferences even though the contextual information did not immediately precede the probe. The findings indicated that if the contextual information is readily available, as defined by the resonance model, predictive inferences can become activated. Nevertheless, similar to previous research, Cook et al. (2001) failed to detect activation of predictive inferences after the inferential information had been backgrounded, indicating that predictive inferences are not instantiated into the text-base representation in long-term memory. However, subsequent work has suggested that when subsequent text supports the inference, the predictive inference will be maintained in working memory (Fincher-Kiefer, 1996; Whitney, Ritchie, & Crane, 1990).
Table 5. Example Passage from Cook et al. (2001)

<table>
<thead>
<tr>
<th>Introduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jimmy was the new kid on the block. Although his parents urged him to go meet</td>
</tr>
<tr>
<td>the other kids in the neighborhood, he was shy and hadn’t made any new friends.</td>
</tr>
<tr>
<td>One Saturday morning, his mom asked him to go to the store for her. While he</td>
</tr>
<tr>
<td>was walking back home, Jimmy ran into some of the kids from the neighborhood.</td>
</tr>
<tr>
<td>They asked him if he wanted to play with them.</td>
</tr>
<tr>
<td>Low Context</td>
</tr>
<tr>
<td>Jimmy was delighted and ran across the street to play with them. They taught</td>
</tr>
<tr>
<td>him a fun game that involved throwing Nerf balls at a target to get points.</td>
</tr>
<tr>
<td>High Context</td>
</tr>
<tr>
<td>Jimmy was delighted and ran across the street to play with them. They taught</td>
</tr>
<tr>
<td>him a fun game that involved throwing rocks at a target to get points.</td>
</tr>
<tr>
<td>Inference-Evoking Sentence</td>
</tr>
<tr>
<td>He missed, though, and he accidentally hit the door of a new car.</td>
</tr>
</tbody>
</table>

The influence of contextual information on the activation of predictive inferences can be explained within the memory-based view and the resonance model. As previously discussed, a strong biasing context results in the passive activation of both semantic and contextual information from earlier portions of the text and from general world knowledge, converging upon inferential information. However, it is also possible for the contextual information to attenuate the activation of a predictive inference. This is exemplified in a study conducted by Peracchi & O’Brien (2005). They investigated whether characteristics of the protagonist could mitigate against the activation of predictive inferences. Participants read passages in which the elaboration was either consistent, inconsistent or neutral in relation to the target inference. Consider the sample passage presented in Table 6.

<table>
<thead>
<tr>
<th>Introduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carol was a single mother with two young children. She had to work two jobs to make ends meet. She worked full-time as a teacher and part-time as a waitress. She hated not having much free time.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Consistent-Trait Elaborated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carol was known for her short temper and her tendency to act without thinking. She never thought about the consequences of her actions, so she often suffered negative repercussions. She refused to let people walk all over her. In fact, she had just gotten a ticket for road rage. She decided she would never put up with anyone that was not nice to her. One particular night, Carol had an extremely rude customer. He complained about his spaghetti, and he yelled at Carol as if it was her fault.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Inconsistent Trait Elaborated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carol was known for her ability to peacefully settle any confrontation. She would never even think to solve her problems with physical violence. She taught her students and her own children how to solve problems through conversation. She believed this was an effective way to stop the increasing violence in schools. Carol also helped other parents learn to deal with their anger. One particular night, Carol had an extremely rude customer. He complained about his spaghetti, and he yelled at Carol as if it was her fault.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Neutral Trait Elaborated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carol loved her kids and would do whatever it took to keep them. She was thankful that she was granted sole custody after the divorce. She didn’t know what she would have done if she lost her children. She tried to make the time that they had together meaningful. They ate dinner together every night and she always planned a fun event for the weekend. One particular night, Carol had an extremely rude customer. He complained about his spaghetti, and he yelled at Carol as if it was her fault.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Target Sentence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carol lifted the spaghetti above his head.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Target Sentence for Baseline Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>She lifted the spaghetti and walked away.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Probe</th>
</tr>
</thead>
<tbody>
<tr>
<td>dump</td>
</tr>
</tbody>
</table>

In this example, Carol was described as short-tempered in the consistent condition and a non-violent woman in the inconsistent condition. In the neutral condition Carol’s relationship with her children was described. The final line of the passage was either an inference-evoking sentence (e.g., Carol lifted the plate of spaghetti above his head) or a control sentence (e.g., She lifted the spaghetti and walked away). Peracchi and O’Brien
(2005) found that naming times on the target concept (e.g., dump) in the consistent and neutral conditions were faster than in the baseline condition, indicating that the predictive inference had been activated. However, naming times did not differ between the inconsistent and baseline conditions. Thus, although some forms of contextual support may facilitate inference activation, when the context is inconsistent with the predictive context, the facilitation effect is eliminated.

The importance of contextual support in detecting the activation of predictive inferences is consistent with findings from other elaborative inferences, such as inferring an antecedent (O'Brien & Albrecht, 1991) or instantiating a category member (O'Brien, Shank, Myers, & Rayner, 1988). Furthermore, this activation has been observed despite the absence of lexical associates within the text. In the study previously discussed by Murray et al. (1993), they demonstrated that inference activation is not due to low-level priming between lexical associates. This was also replicated in the study conducted by Cook et al. (2001). Therefore, it must be the overall meaning that is constructed from individual words, not the individual words themselves that results in the activation of the predictive concept (Cook et al., 2001; Kintsch, 1998; see Keenan, Golding, Potts, Jennings, & Annan, 1990 for cases in which lexical priming results in the activation of an inferential concept).

Despite the building evidence indicating that predictive inferences are activated given sufficient contextual support (e.g., Cook et al., 2001; Murray et al., 1993; Klin et al., 1999a; Klin, Guzman, & Levine, 1999b) there has been less agreement as to whether these inferences are instantiated into the memory representation of the text. In a recent
study Klin et al., (1999a) demonstrated that predictive inferences are in fact encoded into long-term memory. Klin et al. (1999a) employed a contradiction paradigm to detect the inferential information that becomes available to readers. Similar to previous studies, subjects read passages that were either highly predictive (e.g., No longer able to control his anger, he threw a delicate porcelain vase against the wall) or neutral (e.g., He then apologized for getting angry, and offered to clean her delicate porcelain vase to make up for it) in regards to a target concept (e.g., break). After the contextual information was backgrounded, a target sentence was presented that contradicted the potential inference (e.g., Steven picked up the vase and dusted it off). Klin et al. (1999a) found that reading times on the target sentence were slower in the high predictive condition compared to the control condition, indicating that the inference had in fact been instantiated into the text-representation. However, these results differ from the majority of findings suggesting that predictive inferences are not instantiated into long-term memory if subsequent text does not support the inference (Cook et al., 2001; Keefe & McDaniel, 1993; Fincher-Kiefer, 1996; Whitney et al., 1990).

One possibility that reconciles these findings is that predictive inferences may only be "minimally encoded" (McKoon & Ratcliff, 1986). Cook et al. (2001) elaborated on this idea, proposing that the inferential information that becomes available to readers is often something more general, such as a set of features, rather than a specific lexical item. For example, when reading about a fragile porcelain vase being hurled against a wall, a set of features representing the idea of "break," such as ‘destroy,’ ‘chip,’ ‘smash,’ etc., may become activated. It may be that when tested immediately after the inference
evoking sentence, a large number of those features is activated, which in turn raises the activation level of the target inference so that it may be detected with a specific lexical item. However, over time, activation of those features decays and the reader is left with something more general such as “the vase was damaged.” Therefore, when tested immediately after the inference-evoking sentence, a large number of features is activated which may result in the activation of one, or perhaps several lexical items. However, with delay only the features with the most activation would be encoded and the rest would decay. This hypothesis explains why studies using a specific lexical item for a probe fail to detect instantiation of the inference while using a sentence that contradicts the inference results in comprehension difficulty.

Klin and her colleagues (Klin, Guzman, & Levine, 1999b; Weingartner et al, 2003) have recently begun to explore the how the presence of a distractor inference influences the activation of predictive inferences. First, they established a set of materials that demonstrated the activation of a predictive inference using a naming task. They then added a section which elaborated on an additional consequence of the event mentioned in the final line of the passage. For example,

After years of abuse, Susan had enough. She joined a support group for battered women and told her husband, Steven, that she was going to leave him if there was even the mildest violent incident in the house. Steven was taking her seriously and had started counseling. He had managed to control his temper for the past month. He couldn’t bear the thought of her leaving. He felt his life would be over if she and the children left. Today, Steven was angry at Susan because she had left a mess in the kitchen. He tried to cool down, but felt his resentment building. No longer able to control his anger, he threw a delicate porcelain vase against the wall.

In this passage there are two possible consequences of throwing the vase against
the wall: the primary inference that vase may break, and the distractor inference that
Susan may leave Steven. In a control condition the last two sentences were replaced with
neutral information in regards to the predictive concept. They found that naming times
for a probe word representing the primary inference (e.g., break) did not differ between
the predictive and control conditions. Klin et al. (1999b) claimed that this finding could
be interpreted in a number of ways. One hypothesis is that the distractor inference
prevented the activation of the primary inference. However, subsequent research
eliminated this possibility (see Weingartner et al., 2003).

A second possibility is that the primary inference did not reach a sufficient level
of activation because the activation from the signal was split between two concepts in
memory (Klin et al., 1999b). Under the assumptions of the resonance model, contents in
working memory send a signal to all of memory. Anything that shares semantic or
contextual features with this signal will resonate in response. Contents that resonate
sufficiently become part of working memory. Thus, when subjects read about Steven
throwing a delicate porcelain vase against the wall, previous portions of the text that
shared features with that signal, such as “violent incident,” or “lose temper” would
resonate in response. The information contained in that target sentence would also make
contact with information from general world knowledge, resulting in the activation of a
set of features consistent with the idea of “break.” Klin et al. (1999b) argued that in the
present experiment the signal was split between the two possible consequences,

decreasing the amount of activation on each concept.

Weingartner et al. (2003) followed up the on results reported by Klin et al.
(1999b). They used the same basic materials except that a backgrounding section was added, followed by a target sentence that contradicted the primary inference (e.g., Then he walked across the room, picked up the vase, and dusted it off). They found that reading times on the target sentence were slower in the predictive version than the control, indicating the primary inference had been activated. They concluded that competition from the additional consequence led to the activation of a less well-specified inference, thus changing the quality of the representation. Therefore, when no distractor inference is present, predictive inferences would be represented as a proposition and when a distractor inference is present, predictive inferences are only minimally encoded, and represented as something more general. This explanation is also consistent with the conclusion posed by Klin et al. (1999b) that activation is split between the two inferential concepts, decreasing the total amount of activation on each concept.

The hypothesis that activation is decreased due to the splitting of the signal is possible, although to date there is no direct evidence that supports the theory. Under the assumptions of the resonance model, contents in memory will be activated to the extent that they share semantic and contextual features with the incoming signal (Myers & O’Brien, 1999). It is important to understand that this signal is unrestricted in that any concept that shares features will resonate. Elements in memory that are more highly interrelated or integrated resonate more, and thus are more likely to become part of working memory. O’Brien & Myers (1995) stated that this occurs because increasing the degree of elaboration results in the build up of activation on the elaborated concept by increasing the number of retrieval routes by which the signal can make contact with the
item (Myers & O’Brien, 1998). Therefore, the activation of elaborated items is both more probable and occurs more quickly than less elaborated information. In addition, they claimed that the presence of distractors reduces resonance because the signal is divided between different concepts (Myers & O’Brien, 1998).

Thus the resonance model can explain the results of Klin et al. (1999b). Elaboration on textual information increases the probability and speed at which that information becomes available (Albrecht & Myers, 1995; Albrecht & Myers, 1998; Albrecht & O’Brien, 1993; Albrecht & O’Brien, 1991; Cook, Halleran, & O’Brien, 1998; Gueraud, Harmon, & Peracchi, in press; Myers, O’Brien, Albrecht, & Mason, 1994; O’Brien & Albrecht, 1992; O’Brien, Rizzella, Albrecht, & Halleran, 1998; Rizzella & O’Brien, 2002). In experiment by Klin et al. (1999b), the distractor information was highly elaborated, while the primary inference was not. When the target sentence was read, information from the text along with information from general world knowledge would resonate to the extent that they share features with the signal. Presumably, some concept consistent with the primary inference (e.g., break) would become active in memory. In addition, the distractor information in the text would resonate along with any general world knowledge that may be relevant to the distractor information. This means that both the original inference and the distractor information would become active in memory. However, due to the additional elaboration on the distractor material, that information would become available more quickly and would likely interfere with any activation supporting the original inference. However, Klin et al. (1999b) never examined whether the distractor inference is activated. Therefore, the source of the interference is
The hypothesis described above is consistent with work which has demonstrated that when the signal encounters two or more unrelated discourse elements. For example, Albrecht & Myers (1998) found that when a target object is associated to more than one episode in a text, the effectiveness of that object in reactivating the target episode was reduced. Furthermore, O'Brien & Albrecht (1991) found that an antecedent that is not explicitly stated in the passage can become activated despite the explicit mention of the appropriate antecedent and that this activation can interfere with the retrieval of the correct antecedent. O'Brien and his colleagues have also found that all antecedents that share features with an anaphor become activated upon mention of that anaphor (O'Brien & Albrecht, 1991; O'Brien, Albrecht, Hakala, & Rizzella, 1995; O'Brien, Plewes, & Albrecht, 1990).

In summary, previous research has shown that both elaboration and distracting information play an important role in the activation of concepts in memory. The present set of experiment is designed to further investigate the influence of these factors on the activation of predictive inferences.
CHAPTER IV

EXPERIMENTS

The present set of experiments was designed to further explore the nature of inferential processing during the activation of predictive inferences. Klin et al. (1999b) demonstrated that predictive inferences are not activated in the presence of a distractor inference. However, given that the context supporting the distractor inference was substantially elaborated, it is possible that the distractor inference became available more quickly, resulting in an inability to detect the original inference. If this is true, then a distractor inference should be detected. In the following experiments I will investigate how elaboration of the distractor information influences the activation of both the original and a possible distractor inference.

Experiment 1

The first experiment was designed to replicate the results of Klin et al. (1999b), which showed that a primary inference was not detected when distractor information was presented. Participants read a series of passages in one of four conditions: A neutral introduction followed by either a control sentence or an inference-evoking sentence, or a distractor introduction followed by either the control sentence or the inference-evoking sentence (see Table 7 for sample passage). After the final line of the passage, subjects named a target word representing the primary predictive inference (e.g., break).
Table 7. Sample Passage from Experiment 1

Neutral Introduction
Steven and Susan had been married for over twenty years. They met during their senior year in high school and had married when they were 19. Steven had just started a new job as the assistant manager of the accounting department at Sears. It meant a large raise and a lot of extra responsibilities. It also meant long hours and more stress. Steven and Susan were having a hard time adjusting their life to fit his schedule. Today Susan had left a mess in the kitchen which had enraged Steven.

Distractor Introduction
After years of abuse, Susan had enough. She joined a support group for battered women and told her husband, Steven, that she was going to leave him if there was even the mildest violent incident in the house. Steven was taking her seriously. He had managed to control his temper for the past month. He couldn't bear the thought of her leaving. He felt his life would be over if she left. Today Susan had left a mess in the kitchen which had enraged Steven. He felt himself losing it.

Control Sentence
Working hard to control his anger, Steven apologized and offered to clean her delicate vase.

Inference-Evoking Sentence
Unable to control his anger, Steven threw a delicate porcelain vase against the wall.

Probe
break

Comprehension Question
Did Steven leave a mess in the kitchen?

The materials were adapted from Klin et al. (1999b) with some modifications. In the original materials, it was often the case that the activation of the distractor information depended upon the activation of the primary inference. The following passage is one taken from the materials by Klin et al. (1999b):
Sarah and a few friends were vacationing at Fortune Lake, in Montana. The water was infected with a very dangerous virus. If people had any open wounds the virus could cause severe headaches and nausea 24 hours after exposure. The lake stayed open but a statement had been issued warning people to swim at their own risk. Today, Sarah and her friends were playing volleyball at the lake. They were quite a competitive bunch so Sarah was getting quite a workout. She really wanted to win the game. During an especially hard fought point, Sarah’s volleyball went flying toward the rocks in the shallow water. While searching for it, she stepped on a piece of glass.

In this example, the primary inference involves the notion “cut.” The distractor inference is some concept consistent with sick or ill. However, the activation of the inference “sick” is dependent upon the activation of the primary inference “cut.” The present set of materials was designed so that the primary and distractor inferences were independent of each other. In the example presented in Table 8, the distractor context elaborates on the fact that Susan will leave Steven if there is one more violent incident in the house. Thus, when reading about Steven throwing a vase against the wall, readers may infer that Susan will divorce Steven. However, activation of the inference “divorce” is not dependent upon the idea of “break.”

Based on previous experiments (e.g., Klin et al., 1999b), naming times for the original inference concept should be fast after the inference-evoking sentence in the neutral condition, indicating activation of the predictive inference in the absence of distracting information. Naming times should be equally slow in the inference and control version when following the distractor introduction.

Participants.

Participants were 48 University of New Hampshire undergraduates. Participants
received partial course credit for their participation in the experiment.

**Materials.**

The materials were the 24 passages, such as the example presented in Table 7 (see Appendix A for the complete set of materials for Experiment 1). Each passage contained either a neutral introduction (e.g., Steven and Susan are having a hard time adjusting to his new schedule) or a distractor introduction (e.g., Susan threatens to leave Steven if there is another violent incident in the house) followed by either a control sentence (e.g., Working hard to control his anger, Steven apologized and offered to clean her delicate vase) or an inference-evoking sentence (e.g., Unable to control his anger, Steven threw a delicate porcelain vase against the wall). After the final line of the passage, participants named the target predictive inference aloud (e.g., break). This was followed by a simple comprehension question to make sure the participants were reading each passage carefully.

**Procedure.**

Participants were randomly assigned to one of the four materials sets. Each participant was run individually in a session that lasted approximately one hour. All materials were presented on a monitor controlled by a Dell 386 microcomputer.

Participants were instructed to rest their right thumbs on a line-advance key, their right index fingers on a “yes” key, and their left index fingers on a “no” key. Each trial began with the word “READY” in the middle of the screen. When participants were ready to read a passage, they pressed the line-advance key. Each press of the key erased the current line and presented the next line. Comprehension time was measured as the
time between key presses. Each participant was instructed to read at a comfortable, 
normal reading pace. After the last line of the passage disappeared from the screen, the 
cue “XXX” appeared on the screen for 500 ms. The cue was then replaced by a probe 
word. Subjects were instructed to name the probe word aloud as quickly as possible. 
When the word was named, a voice key triggered, the probe word was erased from the 
screen, and the naming time for the word was recorded. After the probe word, the cue 
“QUESTIONS” appeared in the middle of the screen for 2000 milliseconds. This was 
followed by a comprehension question to which participants responded by either pressing 
a “yes” or “no” key. On the trials where participants made errors, the word “ERROR” 
appeared in the middle of the screen for 750 milliseconds. Before beginning the 
experimental passages, participants read three practice passages to ensure that they were 
familiarized with and understood the procedure.

Results and Discussion.

In all analyses reported, F₁ refers to tests against error terms based on participants 
variability, and F₂ refers to tests against an error term based on items variability. All 
analyses were significant at the standard alpha level of .05, unless otherwise indicated. 
Any scores above 2.5 standard deviations were discarded from the analyses. This resulted 
in the elimination of less than 7% of the data from all of the experiments (excluding the 
data from Experiment 2A). The amount of data eliminated between conditions did not 
differ significantly.

The mean naming times are presented in Table 8. There was no main effect of the 
introduction version F₁(1,44) = .022, MSe = 772.128; F₂(1,20) = 1.177, MSe = 672.298.
However, the was an effect of sentence type version $F_1(1,44) = 9.137$, $MSe = 703.973$; $F_2(1,20) = 6.161$, $MSe = 604.05$. There was no introduction by sentence interaction, $p > .05$. Planned comparisons revealed that in the neutral introduction condition, naming times were faster after the inference-evoking sentence than after the control sentence $F_1(1,44) = 7.935$, $MSe = 1347.663$; $F_2(1,20) = 4.405$, $MSe = 1188.839$. There were no significant differences between naming times following the inference evoking sentence or the control sentence in the distractor introduction version $F_1(1,44) = 1.744$, $MSe = 1861.857$; $F_2(1,20) = 1.519$, $MSe = 1622.53$, $p > .05$.

Table 8. Mean Naming Times from Experiment 1

<table>
<thead>
<tr>
<th>Neutral Introduction</th>
<th>Distractor Introduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Sentence</td>
<td>Inference Sentence</td>
</tr>
<tr>
<td>517</td>
<td>502</td>
</tr>
</tbody>
</table>

These results replicated those reported by Klin et al. (1999b). There was evidence of activation of the original inference when preceded by a neutral introduction, as indicated by the faster naming times in the inference version compared to the control version. Also consistent with Klin et al.’s (1999b) results, activation of the original predictive inference was not detected when following the distractor introduction. In other words, it appears as though the primary inference was in fact activated, but only in the absence of distracting information.

One explanation for failing to detect activation of the primary inference in the presence of distracting information is the emotional salience of the distractor information. For example, the emotional importance of distracting information about threatening to
divorce someone may be much more salient compared to distracting information about someone being very hungry. In order to examine this hypothesis, the experimenter examined the materials to look for passages that contained emotionally salient distractors. Of the 24 passages, nine passages contained more emotional salient distractor information. The means for those nine passages were computed (see Table 9 for means). The trend of naming time in the neutral condition was consistent with the overall trend data, indicating that the primary inference is activated. Although naming times in the neutral condition were faster after the inference compared to the control, naming times were also faster following the inference sentence compared to the control in the distractor version. This pattern of results suggest that the emotional salience of the distractor information isn’t the primary factor in eliminating the activation of the original predictive inference.

Table 9. Mean Naming Times (msec) for Passages with Emotionally Salient Distractors

<table>
<thead>
<tr>
<th>Neutral Introduction</th>
<th>Distractor Introduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Sentence</td>
<td>Inference Sentence</td>
</tr>
<tr>
<td></td>
<td>Control Sentence</td>
</tr>
<tr>
<td>517</td>
<td>502</td>
</tr>
<tr>
<td></td>
<td>529</td>
</tr>
<tr>
<td></td>
<td>Inference Sentence</td>
</tr>
<tr>
<td></td>
<td>521</td>
</tr>
</tbody>
</table>

Another hypothesis for the results from Experiment 1 is that the contextual information in the distractor introduction paired with the inference-evoking sentence resulted in the activation of a “distractor inference,” and in turn interfering with activation of the primary predictive inference. This hypothesis is entirely plausible within the memory-based view of text processing. In general, it is likely that contents explicitly stated in the text will be at a somewhat higher level of activation than concepts that are
not explicitly stated in the text (Myers & O’Brien, 1999; O’Brien, 1995). It is also the case that information that is highly elaborated will become available more quickly because of the additional features shared with the signal. Therefore, the information from the text that supports the distractor inference may become available more quickly than information from general world knowledge that supports the primary inference. This being the case, the distractor inference may become available very quickly and interfere with the primary inference. The second experiment was designed to investigate whether or not a distractor inference is activated.

**Experiment 2**

Although the previous experiment indicated that the primary was not activated in the presence of distracting information, it is unclear what exactly interfered with the activation of that inference. Klin et al. (1999b) suggested that an inference representing the distractor information becomes activated and prevents activation of the primary inference. The purpose of the second experiment is to investigate whether the distractor inference does in fact become activated after reading the inference-evoking sentence.

**Experiment 2A**

Participants read passages that contained the distractor introduction followed by the inference-evoking or control sentence. After each passage, participants were instructed to indicate, in one word, what they thought would happen next in the story. This provided an off-line measure to investigate whether participants were even thinking
of the distractor inference.

Participants.

Participants included 40 University of New Hampshire students who had not participated in Experiment 1. Students received course credit for their participation.

Materials.

Each participant was given a booklet containing 24 passages, 1 per page (see Appendix A for the complete set of materials for Experiment 2A). Each passage began with the distractor introduction that was approximately 90 words long. This was followed by the control sentence or inference-evoking sentence that was approximately 14.8 words in length (see Table 10 for sample passage).

Two sets of booklets were generated; in each set, half of the passages ended with the control sentence and the other half ended with the inference-evoking sentence.

Table 10. Sample Passage from Experiment 2A/B

<table>
<thead>
<tr>
<th>Distractor Introduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>After years of abuse, Susan had enough. She joined a support group for battered women and told her husband, Steven, that she was going to leave him if there was even the mildest violent incident in the house. Steven was taking her seriously. He had managed to control his temper for the past month. He couldn't bear the thought of her leaving. He felt his life would be over if she left. Today Susan had left a mess in the kitchen which had enraged Steven. He felt himself losing it.</td>
</tr>
</tbody>
</table>

Control Sentence
Working hard to control his anger, Steven apologized and offered to clean her delicate vase.

Inference Evoking Sentence
Unable to control his anger, Steven threw a delicate porcelain vase against the wall.

Probe (Experiment 2B only)
divorce

Comprehension Question (Experiment 2B only)
Did Steven leave a mess in the kitchen?
Procedure.

Participants were randomly assigned to one of two material sets and were run in a group classroom setting. Participants were instructed to read each passage carefully and then to write what they thought would happen next in the story. They were instructed to write the first thought that came to mind and never to return to the passage after they had responded.

Results and Discussion.

The number of words consistent with the distractor inference was counted in both the inference and control versions. Six passages were eliminated because there was an equal proportion of the distractor inference indicated in the inference and control versions (within 10 percentage points). Based on the remaining 18 passages, the target concept was indicated 57% of the time following the inference version and only 15.25% of the time following the control version (see Appendix C for a list of responses for these passages).

These results indicated that participants were at least thinking of the distractor inference after reading the inference-evoking sentence. However, because this is an offline measure, the results may not reflect automatic activation of the distractor information. For example, contrary to the experimenters instructions, participants may have re-read the text before giving a response, or they may have engaged in some sort of problem solving when thinking about what would happen next in the story. Experiment 2B was designed to avoid these problems by using an online measure of activation.
Experiment 2B was designed to provide an online test of the distractor inference. Although there was a tendency for participants to indicate a concept consistent with the distractor inference, it is unknown whether the distractor inference was activated automatically or if participants were engaging in problem solving. Experiment 2B investigated whether or not an inference representing the distractor information became available automatically after reading the inference-evoking sentence.

Participants.

Participants included 16 University of New Hampshire undergraduates. Participants received partial course credit for their participation in the experiment.

Materials.

The materials included 18 of the experimental passages used in Experiment 2A. See the example presented in Table 10. Each passage included the distractor introduction (e.g., Susan threatened to leave Steven if there is one more violent incident in the house), followed by the inference evoking sentence (e.g., Unable to control his anger, Steven threw a delicate porcelain vase against the wall) or the control sentence (e.g., Working hard to control his anger, Steven apologized and offered to clean her delicate vase). After reading the inference evoking sentence, participants named a word representing the distractor inference (e.g., divorce). The probe was followed by a simple comprehension question to make sure the participants were reading each passage carefully.
Procedure.

Participants were randomly assigned to one of the two materials sets. Each participant was run individually in a session that lasted approximately one hour. All materials were presented on a monitor controlled by a Dell 386 microcomputer.

Participants were instructed to rest their right thumbs on a line-advance key, their right index fingers on a “yes” key, and their left index fingers on a “no” key. Each trial began with the word “READY” in the middle of the screen. When participants were ready to read a passage, they pressed the line-advance key. Each press of the key erased the current line and presented the next line. Each participant was instructed to read at a comfortable, normal reading pace. After the last line of the passage disappeared from the screen, the cue “XXX” appeared on the screen for 500 ms. The cue was then replaced by a probe word. Subjects were instructed to name the probe word aloud as quickly as possible. When the word was named, a voice key was triggered, the probe word disappeared from the screen, and the naming time for the word was recorded. After the probe word, the cue “QUESTIONS” appeared in the middle of the screen for 2000 milliseconds. This was followed by a comprehension question to which participants responded by either pressing a “yes” or “no” key. On the trials where participants made errors, the word “ERROR” appeared in the middle of the screen for 750 milliseconds.

Before beginning the experimental passages, participants read three practice passages to ensure that they were familiarized with and understood the procedure.

Results and Discussion.

Results from Experiment 2B are presented in Table 11. Naming times for the
distractor probe did not differ significantly between the inference and control versions

\[ F_1(1,14) = .176, \text{MSe} = 301.247, p > .05; F_2(1,16) = .278, \text{MSe} = 1479.158, p > .05. \]

This suggests that although the distractor introduction supported an additional inference, that inference was not activated.

Table 11. **Mean Naming Time on Distractor Probe for Experiment 2B**

<table>
<thead>
<tr>
<th>Control Sentence</th>
<th>Inference Sentence</th>
</tr>
</thead>
<tbody>
<tr>
<td>494</td>
<td>497</td>
</tr>
</tbody>
</table>

One possible explanation for these results is that inferences representing the distractor information only became activated when the distracting information was highly emotionally salient. This same hypothesis was examined in Experiment 1. As a final test of this hypothesis, the means for seven of the original nine passages containing emotionally salient distractors were computed and analyzed (two of the original nine passages were eliminated based on the results of Experiment 2A). The mean naming times, in milliseconds, were 490 for the control version and 565 for the inference version. The difference between these two means did not reach statistical significance (\( p > .05 \)). The fact that naming times were considerably slower following the inference sentence lends further support to the conclusion that the emotional salience of the distractor event isn't a primary factor in detecting activation of the original predictive inference.

Another explanation for the results of Experiment 2B may be that some information representing the distractor inference did become available to readers after reading the inference-evoking sentence, but that activation went undetected; that is, it
could be that the inferential information that became available to readers was something more general, such as a set of features that represented the inferential concept. Consider this hypothesis in light of the sample passage presented in Table 10. Upon reading the inference evoking sentence, it is possible that a subset of features that were consistent with "divorce" such as, "separate," "leave," "split," etc., became activated in memory. However, the activation of those features was insufficient to activate the specific lexical item "divorce." Therefore, using a specific word to detect the inference was not sensitive enough to detect what actually became available to readers. The third experiment was designed to investigate the possibility that only a subset of features of the distractor inference became available to readers.

**Experiment 3**

Previous work has demonstrated that inferences may only be minimally encoded as a set of features of a target concept and such inferential activation is difficult to detect with a naming task (Cook et al, 2001; Harmon & O’Brien, in prep). Using a critical sentence that contradicts the inference may be a more sensitive measure, as previous work demonstrated that readers slow down on sentences that contradict previous information in the text (O’Brien & Albrecht, 1992). More recent work on inferences has shown that this contradiction paradigm is in fact more sensitive to the inferential information that becomes available to readers. For example, Klin et al. (1999a) failed to detect any activation of predictive inferences with a naming task, but subsequently work demonstrated that readers slowed down on a sentence that contradicted the target
inference (Weingartner et al., 2004). Similarly, Harmon & O’Brien (in prep) were unable to detect activation of instrumental inferences with a naming task, but demonstrated activation of the inference using a contradictory sentence. In Experiment 3, the contradiction paradigm was used to investigate whether or not a subset of features of the distractor inference becomes available after reading the inference-evoking sentence.

Participants read passages in one of three conditions: the neutral introduction paired with the inference-evoking sentence, the distractor introduction paired with the control sentence, or the distractor introduction paired with the inference-evoking sentence (see Table 12 for a sample passage). After a short continuation sentence readers were presented with two critical sentences. The first sentence was designed to contradict the distractor inference, but remained consistent with the primary inference and with the rest of the passage. The second critical sentence was included because it has been shown that sometimes the integration difficulties caused by contradictory information is delayed by one sentence (Albrecht & O’Brien, 1993). Thus, the second critical sentence would detect any spillover effects of comprehension difficulties due to the inconsistency between the distractor inference and the first critical sentence.
Table 12. Sample Passage from Experiment 3

Neutral Introduction
Steven and Susan had been married for over twenty years. They met during their senior year in high school and had married when they were 19. Steven had just started a new job as the assistant manager of the accounting department at Sears. It meant a large raise and a lot of extra responsibilities. It also meant long hours and more stress. Steven and Susan were having a hard time adjusting their life to fit his schedule. Today Susan had left a mess in the kitchen which had enraged Steven.

Distractor Introduction
After years of abuse, Susan had enough. She joined a support group for battered women and told her husband, Steven, that she was going to leave him if there was even the mildest violent incident in the house. Steven was taking her seriously. He had managed to control his temper for the past month. He couldn't bear the thought of her leaving. He felt his life would be over if she left. Today Susan had left a mess in the kitchen which had enraged Steven. He felt himself losing it.

Control Sentence (paired with Distractor Introduction only)
Working hard to control his anger, Steven apologized and offered to clean her delicate vase.

Inference-Evoking Sentence (paired with Neutral Introduction or Distractor Introduction)
Unable to control his anger, Steven threw a delicate porcelain vase against the wall.

Backgrounding
Suddenly, the doorbell rang. It was Gary, returning Steven's drill. After Gary left, Steven went to the kitchen and looked at Susan.

Target Sentences
She apologized for the mess and hugged him.
Susan understood why Steven was so angry.

If the distractor inference does become activated, the information contained in the critical sentence would contradict that inference, thus resulting in slow reading times on the critical sentence. The argument could be made that reading times on the critical sentences may be slow because they are inconsistent with the distractor context. In order to address this, the distractor introduction was paired with the control sentence.

Participants.
Participants included 36 University of New Hampshire undergraduates who did
not participate in the previous experiments. Participants received partial course credit for their participation in the experiment.

Materials.

The materials included the same 18 experimental passages used in Experiment 2, although the neutral introduction was included in this experiment and some modifications were made (see Appendix D for the complete set of materials for Experiment 3). The passages were presented in one of three experimental conditions: a neutral introduction followed by an inference evoking sentence, a distractor introduction followed by an inference evoking sentence, or the same distractor introduction followed by a control sentence. After a continuation section, participants read two critical sentences. The first sentence was designed to contradict the distractor inference while the second critical sentence was used to detect any spillover effects of integration difficulties. These sentences were followed by a simple comprehension question to make sure the participants were reading each passage carefully.

Procedure.

Participants were randomly assigned to one of the three materials sets. Each participant was run individually in a session that lasted approximately one hour. All materials were presented on a monitor controlled by a Dell 386 microcomputer.

Participants were instructed to rest their right thumbs on a line-advance key, their right index finger on a “yes” key, and their left index fingers on a “no” key. Each trial began with the word “READY” in the middle of the screen. When participants were ready to read a passage, they pressed the line-advance key. Each press of the key erased
the current line and presented the next line. Each participant was instructed to read at a comfortable, normal reading pace. After the last line of the passage disappeared from the screen, the cue “QUESTIONS” appeared in the middle of the screen for 2000 milliseconds. This was followed by a comprehension question to which participants responded by either pressing a “yes” or “no” key. On the trials where participants made errors, the word “ERROR” appeared in the middle of the screen for 750 milliseconds. Before beginning the experimental passages, participants read three practices passages to ensure that they were familiarized with and understood the procedure.

Results and Discussion.

Results from Experiment 3 are presented in Table 13. There was no main effect of version type for the first critical sentence $F_1(2,66) = .457, MSe = 78370.493, p > .05$; $F_2(2,30) = .149, MSe = 75429.849, p > .05$; or the second critical sentence $F_1(2,66) = .312, MSe = 79922.066, p > .05$; $F_2(2,30) = .177, MSe = 49599.202, p > .05$. Planned comparisons revealed no significant differences between groups for reading times on either the first or second critical sentence for subjects or items ($p > .05$). Thus, when the distractor introduction was paired with the inference-evoking sentence, participants did not slow down on a sentence that contradicted the distractor inference.

Table 13. Mean Reading (msec) Times for Experiment 3

<table>
<thead>
<tr>
<th></th>
<th>Neutral</th>
<th>Distractor</th>
<th>Distractor Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Critical Sentence</td>
<td>2490</td>
<td>2550</td>
<td>2504</td>
</tr>
<tr>
<td>Second Critical Sentence</td>
<td>2360</td>
<td>2370</td>
<td>2323</td>
</tr>
</tbody>
</table>

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The fact the readers did not slow down when they encountered a sentence that contradicted the distractor inference indicates that the distractor inference did not become activated, even at a minimal level. Thus, these data are consistent with the data from Experiment 2. This result is somewhat surprising as reading time on a contradictory sentence has been shown to be a more sensitive measure of the inferential information that becomes available to readers as compared to a naming task. In fact, Weingartner et al. (2004) found that readers slowed down on a sentence that contradicted the primary predictive inference, even in the presence of distracting information.

One reason for the pattern of results from these three experiments may be that information other than the two potential inferences becomes activated, and in turn interferes with those potential inferences. This phenomena could easily be explained within the memory-based view of text processing. Recall that within the memory-based view, information becomes available to readers through a fast-acting, passive resonance process. When information is encoded into memory, it sends a signal to all of memory. Any information that shares features with that signal will resonate in response, including information from the text representation and information from general world knowledge. Concepts that share the most features with the signal will resonate the most; items that resonate sufficiently become part of working memory.

In light the passages in the previous three experiments, the inference-evoking-sentence would send a signal to all of memory. Concepts from the distractor portion of the text and from general world knowledge that shared features with the signal would resonate in response. Any information that resonated sufficiently would become part of
working memory. Although the distractor portion of the passages supported one main consequence (e.g., divorce), there is other information that would likely resonate with the inference-evoking sentence. For example, in the distractor introduction of the sample passage, Susan threatens to leave Steven if there is one more violent incident in the house. When readers encountered the sentence about Steven throwing the vase against the wall, it could have resulted in the activation of all information in the distractor portion of the text that shared features with “violent incident,” the actual threat of leaving, Steven’s attempts to control his anger, his feelings about the possibility of Susan leaving. At the same time, it is likely that information from general world knowledge that shared features with the information contained in the inference-evoking sentence became active in memory. Some of the activation from the text and general world knowledge may have converged on the notion of “divorce,” some activation may have converged on “break,” and other possible consequences may have become activated based on the readers’ general world knowledge that is related to the distractor introduction. Thus, after reading the inference-evoking sentence there are a number of possible inferences that may become available, along with information from previous portions of the text and information from general world knowledge. The activation of all of this additional information would result in interference, making it difficult to detect any potential inference with a naming task.

In the case of the reading task, the additional information that becomes activated may have simply eliminated any comprehension difficulties on the critical sentences, because some of the information that becomes reactivated upon reading the inference
sentence may have been neutral, or some information may have actually been consistent with the critical sentence. This hypothesis is in line with recent work which demonstrated that when the amount of inconsistent and consistent information in a text was held constant, the consistent information eliminated the negative influence of the inconsistent information on integration (Gueraud et al., in press). Experiment 4 was designed to explore whether decreasing the amount of information in the distractor introduction that might resonate with the inference sentence influences the activation of the primary inference.

Experiment 4

Previous work has demonstrated that predictive inferences do not become activated in the presence of distracting information, or at most are only activated at a minimal level (Klin et al., 1999; Weingartner et al., 2004). One possibility is that all of the information contained in the distractor section of the text resonates with the inference-evoking sentence and becomes active in memory, in turn resulting in interference with any potential inference. This being the case, if there were less distracting information related to the inference sentence, there would be less interference. The purpose of Experiment 4 was to examine whether the amount of distracting information influences the availability of predictive inferences.

In this experiment, participants read passages such as the one presented in Table 14. The passages either contained a low amount of distractor elaboration, or a high amount of distractor elaboration. These elaboration sections were followed by either an
inference-evoking sentence or a control sentence. Naming times were recorded on the word that represented the primary predictive inference. In the high elaboration version, the amount of distractor elaboration was the same as in Experiment 1. Thus, the pattern of results for the high elaboration version should mimic those of Experiment 1, demonstrating that the primary predictive inference does not become activated in the presence of a high amount distracting information. In contrast, the low elaboration version contains less information that is relevant to the inference-evoking sentence. Therefore, less information from that portion of the passage will resonate with the inference sentence, meaning that there would be less information that could interfere with the potential predictive inference. If this is the case, naming times on the primary inference word should be faster following the inference-evoking sentence compared to the control sentence.

**Participants.**

Participants included 40 University of New Hampshire undergraduates who did not participate in the previous experiments. Participants received partial course credit for their participation in the experiment.
Table 14. Sample Passage from Experiment 4

**Low Elaboration**

Steven and Susan had been married for twenty years. After years of abuse, Susan told Steven she would leave him if there was even the mildest violent incident in the house. In addition, Steven had just started a new job as the assistant manager of the accounting department at Sears. It meant a lot of extra responsibilities, long hours, and more stress. Steven and Susan were having a hard time adjusting their life to fit his schedule. Today Susan had left a mess in the kitchen which had enraged Steven.

**High Elaboration**

After years of abuse, Susan had enough. She joined a support group for battered women and told her husband, Steven, that she was going to leave him if there was even the mildest violent incident in the house. Steven was taking her seriously. He had managed to control his temper for the past month. He couldn't bear the thought of her leaving. He felt his life would be over if she left. Today Susan had left a mess in the kitchen which had enraged Steven. He felt himself losing it.

**Control Sentence**

Working hard to control his anger, Steven apologized and offered to clean her delicate vase.

**Inference Evoking Sentence**

Unable to control his anger, Steven threw a delicate porcelain vase against the wall.

**Probe**

break

**Question**

Did Steven leave a mess in the kitchen?

**Materials.**

The materials included the 24 passages from Experiment 1 with some modifications (see Appendix E for the complete set of materials for Experiment 4). Each passage contained either a low or high amount of distractor elaboration. The low amount of elaboration was held constant at one sentence, made up of 22 words. The high amount of distractor elaboration was the same amount as in the previous experiments. The elaboration sections were followed by either the control sentence (e.g., Working hard to control his anger, Steven apologized and offered to clean her delicate vase) or the inference-evoking sentence (e.g., Unable to control his anger, Steven threw a delicate vase).
porcelain vase against the wall). After the final line of the passage, participants named
the primary inference concept aloud (e.g., break). This was followed by a simple
comprehension question to make sure the participants were reading each passage
carefully.

**Procedure.**

The procedure was the same as Experiment 1.

**Results and Discussion.**

Results from Experiment 4 are presented in Table 15. There was no main effect
of version type for the probe $F_1(1, 36) = .252, MSe = 478.44, p > .05; F_2(1, 20) = .023,
MSe = 1331.867, p > .05; nor was there a main effect for sentence type for the target
probe $F_1(1, 36) = 2.279, MSe = 797.195, p > .05; F_2(1, 20) = .882, MSe = 528.752, p >
.05. However, there was a version by sentence interaction $F_1(1, 36) = 5.175, MSe =
569.798, although this interaction did not reach significance by items, $F_2(1, 20) = .008,
MSe = 746.758, p > .05$. Planned comparisons revealed a significant difference between
the inference and control sentences in the low elaboration condition $F_1(1, 36) = 7.732,
MSe = 1215.107$; this effect did not reach significance by items, $F_2(1, 20) = .391, MSe =
1472.044, p > .05$. The difference between the inference and control sentences in the high
elaborated version did not reach significance by subjects $F_1(1, 36) = 7.732, MSe =
1215.107, p > .05$ or items, $F_2(1, 20) = .341, MSe = 1078.976, p > .05$.  

57
Table 15. Mean Naming Times for Experiment 4

<table>
<thead>
<tr>
<th></th>
<th>Low Elaboration</th>
<th>High Elaboration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>488</td>
<td>477</td>
</tr>
<tr>
<td>Inference</td>
<td>473</td>
<td>479</td>
</tr>
</tbody>
</table>

These results indicated that the amount of elaboration on the distractor concept does in fact influence whether the primary inference concept became activated. When there was less elaboration on distracting information, the primary predictive inference becomes activated. The results are consistent with previous work on inferences showing that increasing the amount of distracting material can result in interference (Corbett, 1984; O'Brien & Myers, 1987). However, these results must be interpreted with caution because the effects did not reach significant by items.

**Experiment 5**

The results from Experiment 4 suggested that when there is less elaboration on the distracting information, the primary predictive inference is more easily detected. These results support the hypothesis that increasing the amount of distracting information results in interference after reading the inference-evoking sentence. However, in the previous experiments the distracting information was always related to the inference-evoking sentence. The purpose of Experiment 5 was to investigate whether or not the relatedness of the distracting information to the inference sentence influenced the activation of the primary predictive inference.

The materials consisted of distracting information that was either highly related to
the inference-evoking sentence or completely unrelated to the inference-evoking sentence (see Table 16 for sample passage), followed by the inference or control sentence. If the relatedness of the distracting information mitigated against activation of predictive inferences, then activation of the primary predictive inference should only be detected when the distracting information is unrelated to the inference-evoking sentence.

Participants.

Participants included 40 University of New Hampshire undergraduates who did not participate in the previous experiments. Participants received partial course credit for their participation in the experiment.

Materials.

The materials included were the passages used in Experiment 4 with some modifications (see Appendix D for a complete set of materials for Experiment 5). Each passage included either a related distractor introduction (e.g., Susan threatens to leave Steven if there is a violent incident in the house) or an unrelated distractor introduction (e.g., Steven has just been laid off and is upset about it) followed by either the control sentence (e.g., Working hard to control his anger, Steven apologized and offered to clean her delicate vase) or the inference-evoking sentence (e.g., Unable to control his anger, Steven threw a delicate porcelain vase against the wall). The unrelated distractor information included one sentence made up of 22 words. The entire unrelated distractor introduction was approximately 90 words. The related distractor introduction was the same as the distractor introduction in Experiment 1. After the final line of the passage, participants named the primary inference concept aloud (e.g., break). This was followed
by a simple comprehension question to make sure the participants were reading each passage carefully.

Table 16. Sample Passage from Experiment 5

<table>
<thead>
<tr>
<th>Related Distractor</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>After years of abuse, Susan had enough. She joined a support group for battered women and told her husband, Steven, that she was going to leave him if there was even the mildest violent incident in the house. Steven was taking her seriously. He had managed to control his temper for the past month. He couldn't bear the thought of her leaving. He felt his life would be over if she left. Today Susan had left a mess in the kitchen which had enraged Steven. He felt himself losing it.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unrelated Distractor</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Steven and Susan had been married for over twenty years. They met during their senior year in high school during which time Steven started working at Sears. He had been working there ever since. Yesterday, Steven found out that he had been laid off. He was absolutely devastated. He didn't know how he would take care of his wife and children. He felt an enormous amount of frustration and anxiety which made him even more stressed. Today, Susan had left a mess in the kitchen which had enraged Steven.</td>
<td></td>
</tr>
</tbody>
</table>

| Control Sentence | Working hard to control his anger, Steven apologized and offered to clean her delicate vase. |

| Inference Evoking Sentence | Unable to control his anger, Steven threw a delicate porcelain vase against the wall. |

<table>
<thead>
<tr>
<th>Probe</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>break</td>
<td></td>
</tr>
</tbody>
</table>

| Question | Did Steven leave a mess in the kitchen? |

| Procedure | The procedure was the same as in Experiments 1 and 4. |

| Results and Discussion | Results from Experiment 5 are presented in Table 17. There was no main effect of relatedness for the probe F₁(1, 36) = .003, MSe = 828.035, p > .05; F₂(1, 20) = .006, MSe = 354.89, p > .05; nor was there a main effect for sentence type for the target probe F₁(1, 36) = .359, MSe = 629.298, p > .05; F₂(1, 20) = .083, MSe = 453.819 2, p > .05. |

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There was no relatedness by sentence interaction $F_1(1, 36) = 1.805, \text{MSe} = 427.618, p > .05; F_2(1, 20) = 1.588, \text{MSe} = 276.631, p > .05$. Planned comparisons revealed no significant differences between any of the conditions, $p > .05$.

Table 17. Mean naming times from Experiment 5

<table>
<thead>
<tr>
<th>Unrelated Distractor</th>
<th>Related Distractor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control 488 Inference 481</td>
<td>Control 484 Inference 486</td>
</tr>
</tbody>
</table>

One explanation of these data is that the presence of any kind of distractor information, related or not, distracts readers attention, resulting in a weaker signal. Therefore, the predictive inference may become activated, but is difficult to detect. However, upon further inspection of the materials, it was observed that in the “unrelated” condition, some “unrelated distractor” information was inadvertently related to the inference-evoking sentences. For example, in the sample passage presented in Table 16, Steven has been laid off and is very stressed about it. This causes him to lose his temper easily. The inference sentence “... he threw a delicate porcelain vase against the wall,” may have resulted in a causal bridging inference to the distractor information (i.e., he threw the vase because he had a short temper due to being laid off). In such cases, the distractor portion of the text may have resonated with the inference-evoking sentence and interfered with the predictive inference. In order to examine this hypothesis, all materials were reviewed for possible connections between the inference sentence and the “unrelated” distracting information. From this review, eight passages were found. An analysis of the results was done on the remaining 16 passages. The means for these
passages are presented in Table 18.

Table 18. Mean naming times for 16 passages from Experiment 5 in unrelated distractor version.

<table>
<thead>
<tr>
<th>Control Sentence</th>
<th>Inference Sentence</th>
</tr>
</thead>
<tbody>
<tr>
<td>492</td>
<td>477</td>
</tr>
</tbody>
</table>

Naming times were considerably faster in the inference compared to the control condition. The trend of these data suggests that the materials were flawed in that some passages contained distracting information that was somehow related to the inference-evoking sentence.

The data for the eight passages that were taken out were also analyzed. The mean naming times for those eight passages were considerably faster in the control version compared to the inference version (480 and 494, respectively). These data further support the hypothesis that for those eight passages, the distracting information was related to the inference-evoking sentence and interfered with the predictive inference.

It is important to note that none of these differences were statistically significant. However, the fact that the analyses were only based on 16 or eight passages decreases the power to reject the null hypothesis. Therefore, it is possible, and very likely that these differences would be significant with more passages. Furthermore, the overall trend of these analyses are consistent with the theory that relatedness is a factor in determining whether or not the distracting information will interfere with activation of the original predictive inference.
CHAPTER V
GENERAL DISCUSSION

The experiments in this dissertation addressed whether predictive inferences become activated in the presence of distracting information. Previous research has shown that when distracting information is present in the passage, predictive inferences are not detected with a naming task (Klin et al., 1999b). However, readers slow down on a critical sentence that contradicts the inference, suggesting that predictive inferences may become activated, but only at a minimal level (Weingartner et al., 2004). The purpose of these experiments was to investigate how and why distracting information influenced the availability of predictive inferences.

In Experiment 1 subjects were presented with passages that contained a neutral or distractor introduction followed by an inference-evoking sentence or a control sentence. This replicated the previous results of Klin et al. (1999b); that is, activation of a primary predictive inference was not detected when distracting information was presented in the text.

One explanation for these results was that an inference representing the distractor information became available and that information became available more quickly, or interfered with activation of the primary inference. In order to test this hypothesis participants were presented with the distractor introduction followed by either the inference-evoking or control sentences. Naming times did not differ between the
inference and control versions, suggesting that the distractor inference was not activated. However, it is possible that only a subset of features that represented the distractor concept became available and that level of activation was insufficient to be detected with a single lexical item. The third experiment addressed this issue by using a critical sentence that contradicted the potential distractor inference. However, there was no evidence of activation of the distractor inference, even when using this contradiction paradigm. Therefore, there is no evidence of any activation of the distractor inference.

One hypothesis for the results of Experiments 2 and 3 was that although a distractor inference does not become activated, portions of the distractor introduction and contents from general world knowledge resonate with the inference-evoking sentence. If those items resonate sufficiently and become part of working memory, they would interfere with the primary predictive inference, eliminating the ability to detect that inference with a naming task. In Experiment 4, when the amount of distracting information was decreased, there was evidence of activation of the primary predictive inference. The combined results from Experiments 2, 3, and 4 suggested that although a distractor inference may not become activated, the distractor portions of the text appear to interfere with activation of the original predictive inference.

Experiment 5 was designed to investigate whether any type of distracting information interfered with the predictive inference or if only related information caused interference. However, the predictive inference was not detected regardless of whether the distractor information was related or unrelated to the inference sentence. Further examination of the "unrelated distractor" materials suggested that some passages
contained information that may have been related to the inference-evoking sentence. When these passages were eliminated from the analyses, the results hinted that the predictive inference may have been activated when the distracting information was unrelated to the inference sentence (the effect was not statistically significant). Furthermore, the materials that contained related distracting information showed a reverse effect; that is, naming times were slower after the inference sentence compared to the control sentence. These results are also consistent with the hypothesis that information in the distractor portion of the text resonated with the inference-evoking sentence and interfere with the primary predictive inference.

The combined results from Experiments 4 and 5 indicate that the difficulty in detecting activation of the original predictive inference may be due to confounds in the materials. Recall that in Experiment 4, although naming times in the low elaboration version were faster after the inference sentence, this difference was not significant by items. The lack of significance in the items analysis suggests that there was some systematic problem with some of the passages. The results from Experiment 5 began to uncover the possible problems with certain passages; mainly that for some passages the “unrelated” distractor portion of the text was inadvertently related to the inference sentence. It is also interesting to note that Klin et al. (1999b), although they were able to detect activation of the original predictive inference with a neutral introduction, the effect was not always significant by items. This lends further support to the notion that there is a systematic problem with some of the materials. Future research may address these problems by controlling for different variables in the materials including the amount of

65
distracting information and the relatedness of between contextual information and the inference sentence.

The results can be interpreted within the memory-based view of text processing (McKoon & Ratcliff, 1995) and the resonance model proposed by Myers and O'Brien (1998). When the inference-evoking was encoded a signal was sent to all of memory, including memory of the text and general world knowledge. Certain concepts, or features from the text and from general world knowledge resonated highly because of the common ideas shared with the inference sentence. Whichever concepts were sufficiently activated became part of working memory.

The combined set of results indicate that when the previous context is neutral in regards to the inference sentence, the main concept that resonated with the inference sentence was the original predictive inference. However, when the distracting context was present, the signal is split between information in the representation of the text in memory and general world knowledge. When the distracting information is highly elaborated, the amount of information in the text representation that shared features with the signal was increased. This would mean that many items in memory would become active but less activation would converge on the predictive inference. If the amount of distracting information is reduced, there would be less interference, and the activation level of the predictive inference would be raised. Indeed, the results from Experiment 4 demonstrated that when there is less distracting information in the text, there was evidence of activation of the primary predictive inference. This result is also consistent with the resonance model. When there is less distracting information, that information
still resonates with the inference-evoking sentence. However, because there is less information that will resonate, there is less interference with the predictive inference.

The hypothesis that distracting information interferes with predictive inferences is also consistent with the idea of minimal activation of inferences. Other work on inferential processing has suggested that inferences may be best understood as the activation of a set of features of a concept rather than a specific lexical item (Cook et al., 2001; Harmon & O'Brien, in prep; Klin et al., 1999a, Klin et al., 1999b, Weingartner et al., 2004). Under certain conditions, for instance, when there is sufficient contextual support, it is possible that the activation of the set of features of the inferential concept would converge on a specific lexical item. However, in cases when there is not enough contextual support, or when portions of the text that are unrelated to the target inference resonate with the inference-evoking sentence, fewer features of the inference may become available, or other the activation of other items may interfere with the inference. Thus, although one reason for the failure to detect the activation of predictive inferences may be the amount of contextual support for the inferential concept, a second reason is that there may be additional information that becomes available that interferes with the inference.

In conclusion, the findings from these experiments indicated that the presence of distracting information interferes with activation of a predictive inference, not because of an additional inference, but because many other portions of the previous text and contents from general world knowledge interfere with the original predictive inference. Further research is necessary to understand other factors that may influence the activation of predictive inferences.
LIST OF REFERENCES


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APPENDIX A

MATERIALS FROM EXPERIMENT 1

Neutral Introduction (Experiment 1 only)
Steven and Susan had been married for over twenty years. They met during their senior year in high school and had married when they were 19. Steven had just started a new job as the assistant manager of the accounting department at Sears. It meant a large raise and a lot of extra responsibilities. It also meant long hours and more stress. Steven and Susan were having a hard time adjusting their life to fit his schedule. Today Susan had left a mess in the kitchen which had enraged Steven.

Distractor Introduction
After years of abuse, Susan had enough. She joined a support group for battered women and told her husband, Steven, that she was going to leave him if there was even the mildest violent incident in the house. Steven was taking her seriously. He had managed to control his temper for the past month. He couldn't bear the thought of her leaving. He felt his life would be over if she left. Today Susan had left a mess in the kitchen which had enraged Steven. He felt himself losing it.

Control
Working hard to control his anger, Steven apologized and offered to clean her delicate vase.

Inference
Unable to control his anger, Steven threw a delicate porcelain vase against the wall.

Probe (Experiment 1 only)
break

Question (Experiment 1 only)
Did Steven leave a mess in the kitchen?
Neutral Introduction (Experiment 1 only)
Richard was starting a new job today repairing the roof of the Federal Courthouse. The work had needed to be done for several years but the city was short on money so it had been put off. The neglected roof was in really bad shape. It always leaked terribly when it rained. Richard had spent the last few days loading his truck with the supplies that he would need for the first week of work. On the morning the new job was starting, Richard carefully set up the scaffold.

Distractor Introduction
Richard was starting a new job today repairing the roof of the old Federal Courthouse. Few people wanted the job because the building was so tall. It was also next to a very busy pedestrian walkway. Dozens of people constantly filled the sidewalk far below. If anything were to drop from the roof, it would seriously injure a person. It was a 26-story building, so even the smallest falling object could be lethal. On the morning the new job was starting, Richard carefully set up the scaffold.

Control
As he finished setting up he suddenly realized he forgot a bucket of paint downstairs.

Inference
As he set up he accidentally kicked an open bucket of paint from the platform.

Probe (Experiment 1 only)
spill

Question (Experiment 1 only)
Was Richard working on the U.N. building?
Neutral Introduction (Experiment 1 only)
Hector had recently become intrigued with the Internet. Lately he had been talking online to a woman named Patricia. She lived near him, and they decided that they should meet in person. Hector was worried because he had not told her that he was unemployed. He had some good leads, but so far nothing solid had come through. He knew he should have just been honest with her when they first talked. They planned to meet at 4:00 p.m. today at a park near Hector's apartment. He left just before four.

Distractor Introduction
Hector had recently become intrigued with the Internet. He spent a lot of time in chat rooms and had recently met a woman named Patricia. She had planned to meet in the park that day. Hector hoped the weather would be nice. For some strange reason, his mood was highly dependent on the weather. If the sun didn't shine, he would become unhappy and mope all day. Hector knew it was absurd, but he had no control over it. Hector got dressed and then walked out to the street.

Control
Hector noticed it was a beautiful day when he looked up and saw blue skies.

Inference
Hector noticed that it was windy and he saw dark clouds thickening in the sky.

Probe (Experiment 1 only)

rain

Question (Experiment 1 only)

Did Hector like using the Internet?
Janice and her boss, Mildred, were hiking on the Appalachian trail. They tried to get out on the weekends and enjoy the outdoors. They had stressful office jobs and found that it helped to keep some balance in their lives. Therefore, they spent their Saturday mornings getting some exercise. This was one of their favorite hikes because it had some fabulous views. They usually hiked for four hours and then ate lunch before heading back. They had just finished their lunch and Mildred was spending a few minutes enjoying a smoke.

Janice loved the outdoors and spent her free time involved in environmental causes. Janice was involved with several radical environmental groups and had been arrested a few times for violent confrontations. When she felt passionate about something, like the environment, she could become extremely angry. Today, Janice was going hiking in the woods with her boss, Mildred. Mildred seemed to have very little respect for the outdoors. Janice remained polite but hoped Mildred wouldn't do anything to annoy her. They had taken a break and Mildred was smoking.

Mildred put out her cigarette, wrapped it in foil and placed it in her backpack.

Janice watched Mildred carelessly toss her lit cigarette in a small pile of dry leaves.

Was Mildred Janice's boss?
Neutral Introduction (Experiment 1 only)
Bob was a pilot in the Air Force. All the men in his family had served in the Air Force and he was proud to carry on the family tradition. He enlisted after high school, just as his father and grandfather had. Today he was heading toward a small island to check out the situation. He was on a wartime mission. He followed instructions as they came on his radio. He was learning that some situations could change instantly. Usually, Bob made sure he was in touch with central command.

Distractor Introduction
Bob had enlisted in the Air Force just after high school. Today, he was on a top-secret mission to destroy enemy military targets. Bob had only been on one other mission and it had been miserable. He had been anxious the whole time. Immediately after attacking the site he had broken down sobbing. He couldn’t bear to think about what he had done. The tears continued for an hour the attack. Currently, Bob was nearing the enemy target. He contacted the central command unit as he reached his destination.

Control Sentence
He checked a screen to make sure that all of the bombs were properly secured.

Inference-Evoking Sentence
He pushed a flashing read button and two of the bombs fell from the plane.

Probe (Experiment 1 only)
explode

Question (Experiment 1 only)
Did Bob join the Air Force after high school?
Neutral Introduction (Experiment 1 only)
Mike was working on a construction project over at the new elementary school. They were building a beautiful new school to replace the one that had been there since the early 1920's. This building would hold the students very comfortably, compared to the cramped conditions in the old school. They were all hoping everything would be ready by September for the upcoming school year. Today Phil, the foreman, was coming over to see how they were progressing. Mike drove Phil around the construction site in his brand new truck.

Distractor Introduction
Mike was working on a construction project at the elementary school. Phil, the foreman, was visiting today to check on their progress. Phil was a moody guy and shouted quite often. He was also very picky about the tidiness of any construction site. Mike heard him screaming at one of the workers last week for leaving his soda can on the ground. Mike and his workers had spent the past two days cleaning up the site. Mike and Phil drove around the construction site in Phil’s new truck.

Control
Mike hoped Phil wouldn’t notice a box of nails that were left out that day.

Inference
Mike cringed as the tire of Phil’s new truck rolled over a box of nails.

Probe (Experiment 1 only)
flat

Question (Experiment 1 only)
Was Mike building a new high school?
Neutral Introduction (Experiment 1 only)
Greg had just left a big party at Delta Upsilon Mu's fraternity house with his friend Sheila. He had a great time, met a few girls, and had a few drinks. He really wanted to pledge Delta Upsilon Mu in the fall. They were a really cool bunch of guys. As he walked, he thought about how sick he was of this winter. He felt like he hadn't seen the sun in weeks. He and Sheila walked through the cold streets until they reached his apartment building, where they said goodnight.

Distractor Introduction
Greg had just left a party at Delta Upsilon Mu's frat house with his friend Sheila. She couldn't stop giggling about the way Greg walked across the ice. He hadn't experienced snow before and was nervous about walking across the ice. Therefore, he was always careful. Sheila found it absolutely hilarious. She would start chuckling before he even started his strange walk. When he was actually walking across the ice, she would be bent over, unable to control herself. They reached his building and he said goodbye to Sheila.

Control Sentence
He walked up the set of steps to the front door of his apartment building.

Inference Evoking Sentence
Sheila watched Greg as he sprinted up a few steps that were covered with ice.

Probe (Experiment 1 only)
slip

Question (Experiment 1 only)
Did Greg leave from Sigma Mu?
Neutral Introduction (Experiment 1 only)
Elaine put a loaf of French bread in the oven and talked with her roommate Maria. She had an hour to kill before Amanda arrived. This meant that after the bread was ready, she'd have to change clothes and get ready to leave. She and Amanda were going to the movies tonight. They had been friends since freshman year. Although they had gone separate directions since then, they were still good friends. Elaine and her roommate Maria also met many years ago, and they could talk up a storm.

Distractor Introduction
Elaine put a loaf of French bread in the oven and talked with her roommate Maria. She had an hour to kill before her biology final exam. This meant that right after the bread was ready, she would have just enough time to make it to the exam. Elaine hated biology because the professor was so strict. During the midterm, a student arrived two minutes late and he would not let her take the exam. Even worse, he didn’t allow make-up exams, so being late resulted in a zero.

Control Sentence
Elaine took the bread out of the oven and let it cool on the table.

Inference Evoking Sentence
Elaine realized she should have taken the bread out of the oven thirty minutes ago.

Probe (Experiment 1 only)
burn

Question (Experiment 1 only)
Were Elaine and Maria roommates?
Neutral Introduction (Experiment 1 only)
Joan was enjoying her new summer job taking care of the grounds of the hotel. She loved having a job that let her spend her days outside in the sunshine. She got this job through a friend and was grateful. There were many summers before where she was stuck inside an office. She did it because she needed money then, but she hated it. Although her new job was hard work, she was paid well. Joan was trimming the hedges around the pool. The guests frequented the pool, so it's kept orderly.

Distractor Introduction
Joan was enjoying her new summer job as groundskeeper of a hotel. She preferred a job in which she spent her days outside in the sunshine. However, she had a problem with the insects. Joan hated bugs. She had an irrational fear of any kind of insect. She never understood this because she had never really had any traumatic experience. Her mother told her she had been like that all her life. The bugs were the only thing Joan didn't like about her job. Today Joan was working around the pool.

Control
Just as she started her work she found an empty old beehive behind a bush.

Inference
Just as she started her work, she bumped a huge beehive and bees flew everywhere.

Probe (Experiment 1 only)
sting

Question (Experiment 1 only)
Was Joan enjoy her job?
Neutral Introduction (Experiment 1 only)

After many years of playing bit parts in low budget movies, the actress got her big break. She had the lead female role in the new Paul Newman film. When her agent showed her the script, she immediately wanted the role. She knew she would be perfect for it. After three auditions, she beat out some of Hollywood’s best new actresses. The actress was having a great time although the work was exhausting. Today they were shooting a scene of the actress on the roof of a 14-story building.

Distractor Introduction

The insurance agent had a reputation for insuring high-risk film projects. His boss ordered him to watch himself or he would be sacked because previous risks were costly to the company. Despite the warnings, he had agreed to insure the set for the new Paul Newman film. The safety crew was sloppy. If anything went wrong, it would cost him his job. Today, the agent stopped by the set to check on the cast and crew. They were shooting a scene of the actress on the roof of a 14-story building.

Control

Suddenly, the actress became dizzy and fell ill on the roof of the tall building.

Inference

Suddenly, the actress lost her footing and fell from the roof of the tall building.

Probe (Experiment 1 only)

dead

Question (Experiment 1 only)

Was Harrison Ford in the movie?
Neutral Introduction (Experiment 1 only)
Fall was finally ending and Bruce decided it was time to winterize the house. He had noticed that a few of the shingles on the roof were loose. They would not survive another Wisconsin winter in that condition. Bruce went to the hardware store and bought the supplies he needed to fix the roof. He wasn't much of a handyman, but the guy at the store assured him it was an easy job and should only take a couple hours. Bruce started the work on Saturday. He was very neat and meticulous.

Distractor Introduction
Bruce decided he needed to fix the roof on his house. Although he wasn't much of a handyman, the guy at the store assured him it was an easy job and should only take a couple of hours. However, it seemed like everything went wrong. He had made many mistakes and his equipment kept falling to the ground. Bruce was ready to give up. He vowed that if even one more small thing went wrong he would be done. He was trying to be neat and meticulous in his work.

Control
He wanted to do a good job fixing the roof to prevent any future leaks.

Inference
However, while reaching for the hammer, his shirt snagged on the tooth of a nail.

Probe (Experiment 1 only)
rip

Question (Experiment 1 only)
Was Bruce going to watch a baseball game?
Neutral Introduction (Experiment 1 only)
Today, Ziggy was running in the Boston marathon. Ziggy had spent the last year preparing for the race and promised himself he would not be nervous. However, Ziggy couldn't help it. He had been anxious up until the point when race finally started. He had stocked up on carbohydrates last night at the runner's party. They had eaten several servings of pasta. Ziggy was happy because it was a brisk fifty degrees and there was a soft breeze blowing. As he passed the finish line, Ziggy looked for his wife.

Distractor Introduction
Today, Ziggy was running in the Boston marathon. His wife was very supportive of his running. She consistently attended all of the races and even brought their two kids along. At the end of each race she would embrace Ziggy and congratulate him on the great run. The greeting he received from his wife was Ziggy's favorite part of the whole race. Ziggy was pleased to see his family still came out to support him. As he passed the finish line, his legs were weak and he felt dizzy.

Control Sentence
When he saw his wife, he struggled to think of a way to thank her.

Inference Evoking Sentence
He saw his wife waiting for him and feebly struggled his way over to her.

Probe (Experiment 1 only)
collapse

Question (Experiment 1 only)
Did Ziggy's family watch the race?
Neutral Introduction (Experiment 1 only)
Roxy and Jason were on an Alaskan cruise. This was their first vacation together, and they were happy they could afford it. They married young, and neither one of them had much money. Roxy had become pregnant the year they married. It was a struggle to support their child and keep their marriage going. Jason worked three jobs while Roxy cared for the baby. Her parents had agreed to babysit while they were away. Today, they were sitting on the deck enjoying the views. Suddenly, they heard a terrible sound.

Distractor Introduction
Roxy and Jason were on an Alaskan cruise. They would dock in Anchorage in another two hours. Roxy didn't know it, but Jason had been blackmailed by smugglers to deliver some heroin to Alaska. They had threatened to murder his daughter if he didn't get the drugs delivered by noon today. It was 9:30 AM and Jason was checking his watch. He would have just enough to make the delivery. Jason prayed that the cruise would arrive on time. The smugglers were dangerous. Suddenly, they heard a terrible sound.

Control
An announcement was made that the cruise ship had just run into a gigantic iceberg.

Inference
One of the waiters had dropped a huge tray of coffee mugs and breakfast dishes.

Probe (Experiment 1 only)
sink

Question (Experiment 1 only)
Were Roxy and Jason on a Caribbean cruise?
Neutral Introduction (Experiment 1 only)
Jessica was on her way home from the library. She had met with some friends for a study session for their physics exam. It was finals week and Jessica was constantly studying. Her first final would start tomorrow, first thing in the morning. After her exam she would have another two hours to study for her physics exam. She knew it would be the most difficult exam. She had studied hard because she really wanted an A in the class. Jessica rehearsed the material and didn’t notice the speedometer hit 75.

Distractor Introduction
Jessica was on her way to the library to meet up with the physics study group. They were meeting at 3 in the lobby of the library and would then decide where they wanted to study. The group was quite punctual and they never waited for anyone. Jessica needed to get there on time, otherwise she wouldn’t know where they would be for the study session. She only had a few more minutes and then the group would leave without her. Jessica pressed the gas peddle down and hit 75.

Control
A few minutes later she saw a man standing in the road, flagging her down.

Inference
A few minutes later she saw flashing lights and a cop pulled up behind her.

Probe (Experiment 1 only)
ticket

Question (Experiment 1 only)
Was Jessica taking a physics class?
Neutral Introduction (Experiment 1 only)
Samantha was excited to be spending the day at the beach. She was getting married next month and was feeling crazed. She had most of the arrangements finished, but a million last minute details were left. Most of her family lived in South Dakota so she had arranged for their trips and gave them ideas about what to do for the few days before and after the wedding. Samantha set up on her favorite beach. It was a hot, sunny day. As Samantha lay there, her mind drifted.

Distractor Introduction
Samantha was excited to spend some time at the beach. She was getting married tomorrow and was feeling crazed. She thought an hour at the beach would help. However, Samantha had to be careful. She tended to get sun stroke very easily. If she was outside in the heat for too long, she would become violently ill. She planned on staying at the beach for no more than one hour. Samantha set up on her favorite beach. It was a hot, sunny day. As Samantha lay there, her mind drifted.

Control
She fell asleep under the shade of her large beach umbrella for over two hours.

Inference
She soon fell sound asleep and napped under the hot sun for over two hours.

Probe (Experiment 1 only)
red

Question (Experiment 1 only)
Was Samantha going on a date?
Neutral Introduction (Experiment 1 only)
Marilyn recently got a new job and was excited about starting. She was meeting with the new babysitter, Pete today. She had spent three months interviewing for her new job and had almost given up hope. Finally, she found a position that she loved as the assistant curator for the Natural History Museum. She couldn't believe it when they offered her the job. Pete arrived at 1:30. Pete asked Marilyn about his daily tasks. She explained that Cocoa, the Doberman, needed to be fed once a day. Marilyn called Cocoa.

Distractor Introduction
Marilyn recently got a new job and was excited about starting. She was meeting with the new babysitter, Pete today. Marilyn worried about how Cocoa would respond to Pete. He had attacked other people in the past. If Cocoa attacked someone one more time, he would have to be put down. Marilyn loved Cocoa dearly and would be devastated if she lost him. When Pete arrived, she told him all about the dog. She explained that Cocoa, the Doberman, needed to be fed once a day. Marilyn called Cocoa.

Control
The dog walked over to Pete to sniff his hands and tried to lick him.

Inference
The dog started barking as he ran toward Pete and lunged hungrily at his ankles.

Probe (Experiment 1 only)
bite

Question (Experiment 1 only)
Was Marilyn starting a new job?
Neutral Introduction (Experiment 1 only)
Sophie had listened to her daughters, Jill and Kayla, fighting all morning. Their petty arguments were driving her crazy. She never understood the sibling rivalry between them. Sophie tried very hard to give the girls an equal amount of attention. In her family, her mother had always preferred her younger brother and she hated it. She vowed she would never do the same to her children. Sophie heard Kayla politely asking Jill to let her have the red-haired doll. Jill told Kayla she could have another doll instead.

Distractor Introduction
Sophie had listened to her daughters, Jill and Kayla, fighting all morning. Their petty arguments were driving her crazy. Sophie gave them a final warning that if they got into even the smallest argument, they would get smacked on the bottom. Although Sophie did not physically punish the girls often, she had been pushed to her limit. The girls were currently playing with their dolls in the living room. Sophie heard Kayla politely asking Jill to let her have the red-haired doll. Jill told Kayla she could have another doll instead.

Control Sentence
Kayla agreed to have the other doll if her doll could wear the pink dress.

Inference Evoking Sentence
Kayla screamed at Jill as she tightened her arm and pulled back a closed fist.

Probe (Experiment 1 only)
punch

Question (Experiment 1 only)
Was Sophie the mother?
Neutral Introduction (Experiment 1 only)
Margie was having a rough day. It was only Monday and her boss was already driving her crazy with all of his demands. She could barely finish one job before he found two or three more for her to do. Margie had recruited her new assistant to help her out with all of the extra work. There was no way she would be able to finish by herself. It was past midnight before Margie finished her work. She locked up the office and headed to her car completely exhausted.

Distractor Introduction
Margie was having a rough day. It was only Monday and her boss was already driving her crazy with all of his demands. She could barely finish one job before he found two or three more for her to do. She hadn’t been able to have her lunch because she was so busy. In fact, she hadn’t had anything since breakfast at six. Margie was starving, but didn’t want to interrupt her work. It was past midnight before Margie finished her work. She headed to her car completely exhausted.

Control
She knew her boss wouldn’t even appreciate all of the extra work she had done.

Inference
Margie knew exactly what she was going to do when she finally got home.

Probe (Experiment 1 only)
sleep

Question (Experiment 1 only)
Was Margie at work?
Neutral Introduction (Experiment 1 only)
Kristi and Keith were getting married today. Kristi couldn't believe that the day had finally come. They had set the date almost two years ago. She hadn't liked the idea of such a long engagement, but Keith was in the army and was stationed overseas. They felt being engaged would make it easier to be together despite the long distance. She thought she would be really nervous today, but she was just excited. Kristi's grandmother started crying as soon as she saw Kristi and Keith standing at the altar.

Distractor Introduction
Kristi and Keith were getting married today. Keith had been a nervous wreck all morning. It didn’t help any that it was 95 degrees inside the church. The heat was really starting to get to him. Furthermore, he had skipped breakfast that morning because he was anxious about being in front of everyone at the church. He was feeling light-headed and dizzy. He was worried that seeing Kristi’s worried face would cause him to pass out immediately. Kristi knew something was wrong but didn’t know what to do.

Control Sentence
Having just finished reciting their vows, Kristi and Keith slowly turned toward the minister.

Inference Evoking Sentence
Having just finished reciting their vows, Kristi and Keith slowly turned toward each other.

Probe (Experiment 1 only)
kiss

Question (Experiment 1 only)
Were Kristi and Keith getting married?
Neutral Introduction (Experiment 1 only)
Benny and his friend Carl were playing football in the living room. They were both on the varsity football team. The season had just ended. They hadn’t had a great year, but still enjoyed being on the team. Next year the team would be getting a new coach. Both guys were curious how it would turn out for the team. Benny thought that the old coach was irreplaceable. Carl tossed the ball pretty hard. Benny caught it and then threw the ball back to Carl as hard as he could.

Distractor Introduction
Benny and his friend Carl were playing football in the living room. His parents had repeatedly told him that he should not play ball in the house. They had caught him once and he had been grounded for a week. They told him if he did it again the punishment would be much worse. However, they were out of town this weekend, so he knew they would never find out. Carl tossed the ball pretty hard. Benny caught it and then threw the ball back as hard as he could.

Control
Carl almost didn’t catch the ball because he was watching a bird outside the window.

Inference
Benny’s mom came in the room as the speeding ball flew straight toward the window.

Probe (Experiment 1 only)
smash

Question (Experiment 1 only)
Was Carl Benny’s brother?
Neutral Introduction (Experiment 1 only)
Shari wanted to do something new and exciting so she decided to go skydiving. She had never done it before but she loved to try new things. Her best friend Lucy had agreed to go with her. The past few days they had sat through a couple of courses instructing them on proper skydiving technique. Lucy was nervous, but Shari was just excited. Shari loved to push herself to the limit. She could feel the adrenaline as the plane climbed higher. Finally, she heard her instructor say it was time.

Distractor Introduction
Shari wanted to do something new and exciting so she decided to go skydiving. She had never done it before and was nervous. She had always been a little afraid of heights but wanted to get over the fear. Whenever she got up high, she felt as if her brain was spinning inside her head. When she saw how far away she was from the ground she would get light-headed. As the plane climbed higher, she could feel herself becoming more anxious. Finally, she heard her instructor say it was time.

Control
Shari closed her eyes and tried to calm her nerves by singing a familiar song.

Inference
Shari stood up, walked over to the edge, and looked down at the ground below.

Probe (Experiment 1 only)
jump

Question (Experiment 1 only)
Did Shari want to try something new?
Neutral Introduction (Experiment 1 only)
Jack was out with his friends today. They had bought a carton of eggs and were sitting near the side of the road. His friends had all taken turns hurling the eggs at passing cars. They thought it was hysterical to see the drivers’ faces when the egg struck their cars. They were well hidden behind some bushes, so they were fairly confident they would not get caught. So far, none of the drivers had seen them. It was now Jack’s turn to hit the next car with an egg.

Distractor Introduction
Jack was out with his friends. They bought a carton of eggs and his friends were taking turns hurling eggs at passing cars. The night before they had played baseball at a nearby field. Jack had pitched the whole night. Today his arm was very sore. It seared every time he moved his arm. Jack felt like he was being tortured every time he moved his arm. He watched his best friend miss one of the cars. It was now Jack’s turn to hit the next car with an egg.

Control
Jack declined, explaining to his friends that he did not want to get in trouble.

Inference
Jack saw a car approaching so he grabbed an egg and pulled his arm back.

Probe (Experiment 1 only)
throw

Question (Experiment 1 only)
Was Jack playing with his friends?
Neutral Introduction (Experiment 1 only)
Amy was camping at a park in upstate New York. It was mid-August and the humidity was unbearable. Amy was from Arizona, so she wasn’t used to the dampness. She couldn’t believe how her blankets and clothes actually felt wet. Even worse, her food was spoiling faster than she expected. Despite these problems, Amy was having a good time. She had met some nice people at the park. Tonight, she was sitting around a campfire with some of her new friends. They were talking and laughing as they roasted marshmallows.

Distractor Introduction
Amy was camping at a park in upstate New York. It was mid-August and the humidity was unbearable. Even worse, the damp air attracted all kinds of insects, especially mosquitoes. Amy was constantly smacking herself, trying to kill the pesky bugs. She hadn’t bought insect repellent, so she had to be absolutely vigilant about it. Whenever she felt anything on her skin, she would instantly smack it. Tonight she was sitting around a campfire with some friends she had made. They were talking and laughing as they roasted marshmallows.

Control
Just then, a ranger approached them and asked if they would keep their voices down.

Inference
Just then, Amy felt a little tickle and then saw a mosquito on her arm.

Probe (Experiment 1 only)
itch

Question (Experiment 1 only)
Was Amy camping in New Jersey?
Neutral Introduction (Experiment 1 only)
It was almost Valentine’s Day and Derek had to buy a gift for his girlfriend. He was low on cash and couldn’t afford anything expensive. He had found a beautiful ring, but it was way out of his price range. Alfred, the jeweler, was standing near the door talking to another customer. The man had been quite rude to Derek when he inquired about the price. Derek wondered what he should do. He didn’t think any other gift would be as nice. After much thought, he made his decision.

Distractor Introduction
It was almost Valentine’s Day and Derek had to buy a gift for his girlfriend. He had found a beautiful ring, but it was way out of his price range. Alfred, the jeweler, was busy with another customer on the other side of the room. Alfred thought about the new robbery system he had installed. It was wired to each and every jewel case. When switched on, small sensors noticed if the jewelry shifted in any way. Sirens would sound immediately with such movements. Meanwhile, Derek was contemplating what to do.

Control
He got the jeweler’s attention and asked if he could make payments on the ring.

Inference
He checked and saw the jeweler was not looking as he picked up the ring.

Probe (Experiment 1 only)

steal

Question (Experiment 1 only)

Was Derek getting married?
APPENDIX B

RESPONSES FROM EXPERIMENT 2A.

1. Steven and Susan
   a. Inference - anger, leave (6), divorce (2), death, stay, separate, stay (2), over, abuse, fight, violence, self-control
   b. Control - violent, compromise, understand, self control, change, break(2), forgive, recovery, nice, not leave, clean, kiss, divorce, apologize, make up, commitment, flip out

2. Richard
   a. Inference - fell, lawsuit (3), yell, no hurt, move trouble, spill (2), injury, explode, kill, hit, death, accident (2), trouble
   b. Control - height, down (5), get it (3), risk, descend, yell, fall (2), stairs, downstairs, stress, repair, went

3. Hector
   a. Inference - rain, mope (2), bad mood (2), depressed (3), shame, stupid, bad date, unhappy, cold, depression, sad (3), stand up, cranky
   b. Control - love (3), happy (16), joyful

4. Janice and Mildred
   a. Inference - fire (3), angry (3), scream, reprimand, confrontation (5), mad, stupid, lost temper, fight, picked up, freak out
   b. Control - relieved (2), surprise (2), smile (2), respect (2), thank, great, compliment (2), hike, considerate (2), confront, walk (2), pleased (2)

5. Mike
   a. Inference - flat (2), angry (3), shout (2), yell (4), pop, fired (2), flip out, pick up, argument, unfortunate, scream, fight
   b. Control - yell (3), anxious (4), scream, mean, scared, distract, notice, absurd, obsessive, nervous (2), irritation, fear, trouble

6. Joan
   a. Inference - scared, scream (3), ran (2), fear (2), freak out (2), trauma, panicked, sting (3), ouch, chaos, swam, jump pool, run away
   b. Control - run, insect, panic (2), bees, terror, scream (2), fright, panic, dive water, left, freak out (2)
7. Actress
   a. Inference - fired (9), help, unemployed (3), dead (2), splat (2), trouble, lose job, ambulance
   b. Control - death (2), fall, fell off, ran to her, cut, off, applauding, sacked (2), sued, claim, canned, lost job, rescued, cancel, sick, fired, lawsuit, fired

8. Bruce
   a. Inference - rip (6), bleed, quit (6), finish, done, worked, gave up (2), frustrated
   b. Control - finished (3), contractor, quit (2), fell, bad, stupid, mistakes (2), success (2), give up, messed up, hot, determination, repairs, frustration (2)

9. Roxy and Jason
   a. Inference - made it, desperation, anxiety, sink, kill (2), dead (5), grief, on time, delay, murder, drown, late, scared, trouble (2)
   b. Control - disaster, jump (3), scared, worried, break, ticket, panic (3), startled, nervous, irrelevant, problem, anxiety, company, deal, stress, look at watch

10. Jessica
    a. Inference - late (10), pull over (2), stop, investigation, ticket (4), walk, left without her.
    b. Control - stop (5), ticket (7), cop, construction, help, doesn’t stop, accident (2), pull over

11. Samantha
    a. Inference - sick (10), sunstroke(3), heat stroke, anger, ill, dead, burn, sunburn(2)
    b. Control - burn (7), stroke, ill (2), awake, sick (5), sunstroke (3)

12. Marilyn and Pete
    a. Inference - caught him, euthanasia, panic, ran, put away, attack, bad, bite (6), sleep (2), put down (3), death
    b. Control - love, bit, smile, relief (3), happy, friendship, success, pat, comp, ok, ease played, comfort (2), content, keep, nothing, fed, left

13. Margie
    a. Inference - eat (15), sleep (4), food
    b. Control - eat (3), quit (3), speed, call out, angry (2), stupid, dedicated, hungry, food (2), raise, crazy, disappoint, starving, unappreciative

14. Benny and Carl
    a. Inference - crash (3), spank, grounded (5), glass, trouble (3), back in town, broke (3), smash, punish, caught
    b. Control - break (4), throw (3), trouble, stop (3), play, punish, whoa, smash, stop, scared, argument, laughter, mad, pass it
15. Shari
   a. Inference - chicken out (4), jump(8), dizzy (3), faint, vomit, puke, light-headed
   b. Control - fall, jump (15), dive, no jump, anxious, nervous

16. Jack
   a. Inference - hit (3), throw (2), pain (7), snap, miss (2), stop, surgery, hurt, dislocate
   b. Control - left, tendinitis, jeer, taunt, laugh (3), lied (3), mature, hassle, throw, pain, coward, peer pressure (2), name calling, made fun, bullied

17. Amy
   a. Inference - smack (11), dead, bite (2), slap (4), hit, killed
   b. Control - trouble, sorry (2), laugh, quiet (3), agreed, repellant, asked, smack (3), slap, nothing, annoyed, consent, ate, apology, frustrated

18. Derek
   a. Inference - theft, alarm (8), left, sirens (3), put back, arrested (2), steal, run, walk away
   b. Control - buy (5), close, leave, don't buy, alarm, credit, what, spend, payment, legal, good guy, bug, stole (2), relief, sale
APPENDIX C

MATERIALS FROM EXPERIMENT 2B

Introduction
After years of abuse, Susan had enough. She joined a support group for battered women and told her husband, Steven, that she was going to leave him if there was even the mildest violent incident in the house. Steven was taking her seriously. He had managed to control his temper for the past month. He couldn't bear the thought of her leaving. He felt his life would be over if she left. Today Susan had left a mess in the kitchen which had enraged Steven. He felt himself losing it.

Control
Working hard to control his anger, Steven apologized and offered to clean her delicate vase.

Inference
Unable to control his anger, Steven threw a delicate porcelain vase against the wall.

Probe

Question
Did Steven leave a mess in the kitchen?

Introduction
Richard was starting a new job today repairing the roof of the old Federal Courthouse. Few people wanted the job because the building was so tall. It was also next to a very busy pedestrian walkway. Dozens of people constantly filled the sidewalk far below. If anything were to drop from the roof, it would seriously injure a person. It was a 26-story building, so even the smallest falling object could be lethal. On the morning the new job was starting, Richard carefully set up the scaffold.

Control
As he finished setting up he suddenly realized he forgot a bucket of paint downstairs.

Inference
As he set up he accidentally kicked an open bucket of paint from the platform.

Probe

hurt

Question
Was Richard working on the U.N. building?
Introduction
Hector had recently become intrigued with the Internet. He spent a lot of time in chat rooms and had recently met a woman named Patricia. She had planned to meet in the park that day. Hector hoped the weather would be nice. For some strange reason, his mood was highly dependent on the weather. If the sun didn't shine, he would become unhappy and mope all day. Hector knew it was absurd, but he had no control over it. Hector got dressed and then walked out to the street.

Control
Hector noticed it was a beautiful day when he looked up and saw blue skies.

Inference
Hector noticed that it was windy and he saw dark clouds thickening in the sky.

Probe
sad

Question
Did Hector meet Patricia in the park?

Introduction
Janice loved the outdoors and spent her free time involved in environmental causes. Janice was involved with several radical environmental groups and had been arrested a few times for violent confrontations. When she felt passionate about something, like the environment, she could become extremely angry. Today, Janice was going hiking in the woods with her boss, Mildred. Mildred seemed to have very little respect for the outdoors. Janice remained polite but hoped Mildred wouldn't do anything to annoy her. They had taken a break and Mildred was smoking.

Control
Mildred put out her cigarette, wrapped it in foil and placed it in her backpack.

Inference
Janice watched Mildred carelessly toss her lit cigarette in a small pile of dry leaves.

Probe
mad

Question
Was Mildred Janice's boss?
Introduction
Mike was working on a construction project at the elementary school. Phil, the foreman, was visiting today to check on their progress. Phil was a moody guy and shouted quite often. He was also very picky about the tidiness of any construction site. Mike heard him screaming at one of the workers last week for leaving his soda can on the ground. Mike and his workers had spent the past two days cleaning up the site. Mike and Phil drove around the construction site in Phil’s new truck.

Control
Mike hoped Phil wouldn’t notice a box of nails that were left out that day.

Inference
Mike cringed as the tire of Phil’s new truck rolled over a box of nails.

Probe
yell

Question
Was Mike building a new school?

Introduction
Joan was enjoying her new summer job as groundskeeper of a hotel. She preferred a job in which she spent her days outside in the sunshine. However, she had a problem with the insects. Joan hated bugs. She had an irrational fear of any kind of insect. She never understood this because she had never really had any traumatic experience. Her mother told her she had been like that all her life. The bugs were the only thing Joan didn’t like about her job. Today Joan was working around the pool.

Control
Just as she started her work she found an empty old beehive behind a bush.

Inference
Just as she started her work, she bumped a huge beehive and bees flew everywhere.

Probe
scared

Question
Was Joan the groundskeeper for a country club?
Introduction
The insurance agent had a reputation for insuring high-risk film projects. His boss ordered him to watch himself or he would be sacked because previous risks were costly to the company. Despite the warnings, he had agreed to insure the set for the new Paul Newman film. The safety crew was sloppy. If anything went wrong, it would cost him his job. Today, the agent stopped by the set to check on the cast and crew. They were shooting a scene of the actress on the roof of a 14 story building.

Control
Suddenly, the actress became dizzy and fell ill on the roof of the tall building.

Inference
Suddenly, the actress lost her footing and fell from the roof of the tall building.

Probe
fired

Question
Was the movie done by Paul Newman?

Introduction
Bruce decided he needed to fix the roof on his house. Although he wasn't much of a handyman, the guy at the store assured him it was an easy job and should only take a couple of hours. However, it seemed like everything went wrong. He had made many mistakes and his equipment kept falling to the ground. Bruce was ready to give up. He vowed that if even one more small thing went wrong he would be done. He was trying to be neat and meticulous in his work.

Control
He wanted to do a good job fixing the roof to prevent any future leaks.

Inference
However, while reaching for the hammer, his shirt snagged on the tooth of a nail.

Probe
quit

Question
Was Bruce going to watch a baseball game?
**Introduction**  
Roxy and Jason were on an Alaskan cruise. They would dock in Anchorage in another two hours. Roxy didn't know it, but Jason had been blackmailed by smugglers to deliver some heroin to Alaska. They had threatened to murder his daughter if he didn't get the drugs delivered by noon today. It was 9:30 AM and Jason was checking his watch. He would have just enough to make the delivery. Jason prayed that the cruise would arrive on time. The smugglers were dangerous. Suddenly, they heard a terrible sound.

**Control**  
An announcement was made that the cruise ship had just run into a gigantic iceberg.

**Inference**  
One of the waiters had dropped a huge tray of coffee mugs and breakfast dishes.

**Probe**
*kill*

**Question**
Were Roxy and Jason on a Caribbean cruise?

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**Introduction**  
Jessica was on her way to the library to meet up with the physics study group. They were meeting at 3 in the lobby of the library and would then decide where they wanted to study. The group was quite punctual and they never waited for anyone. Jessica needed to get there on time, otherwise she wouldn't know where they would be for the study session. She only had a few more minutes and then the group would leave without her. Jessica pressed the gas peddle down and hit 75.

**Control**  
A few minutes later she saw a man standing in the road, flagging her down.

**Inference**  
A few minutes later she saw flashing lights and a cop pulled up behind her.

**Probe**
*late*

**Question**
Was Jessica taking a physics class?
Introduction
Samantha was excited to spend some time at the beach. She was getting married tomorrow and was feeling crazed. She thought an hour at the beach would help. However, Samantha had to be careful. She tended to get sun stroke very easily. If she was outside in the heat for too long, she would become violently ill. She planned on staying at the beach for no more than one hour. Samantha set up on her favorite beach. It was a hot, sunny day. As Samantha lay there, her mind drifted.

Control
She fell asleep under the shade of her large beach umbrella for over two hours.

Inference
She soon fell sound asleep and napped under the hot sun for over two hours.

Probe
sick

Question
Was Samantha going on a date?

Introduction
Marilyn recently got a new job and was excited about starting. She was meeting with the new babysitter, Pete today. Marilyn worried about how Cocoa would respond to Pete. He had attacked other people in the past. If Cocoa attacked someone one more time, he would have to be put down. Marilyn loved Cocoa dearly and would be devastated if she lost him. When Pete arrived, she told him all about the dog. She explained that Cocoa, the Doberman, needed to be fed once a day. Marilyn called Cocoa.

Control
The dog walked over to Pete to sniff his hands and tried to lick him.

Inference
The dog started barking as he ran toward Pete and lunged hungrily at his ankles.

Probe
sleep

Question
Was Marilyn starting a new job?
Introduction
Margie was having a rough day. It was only Monday and her boss was already driving her crazy with all of his demands. She could barely finish one job before he found two or three more for her to do. She hadn’t been able to have her lunch because she was so busy. In fact, she hadn’t had anything since breakfast at six. Margie was starving, but didn’t want to interrupt her work. It was past midnight before Margie finished her work. She headed to her car completely exhausted.

Control
She knew her boss wouldn’t even appreciate all of the extra work she had done.

Inference
Margie knew exactly what she was going to do when she finally got home.

Probe
eat

Question
Was Margie at work?

Introduction
Benny and his friend Carl were playing football in the living room. His parents had repeatedly told him that he should not play ball in the house. They had caught him once and he had been grounded for a week. They told him if he did it again the punishment would be much worse. However, they were out of town this weekend, so he knew they would never find out. Carl tossed the ball pretty hard. Benny caught it and then threw the ball back as hard as he could.

Control
Carl almost didn’t catch the ball because he was watching a bird outside the window.

Inference
Benny’s mom came in the room as the speeding ball flew straight toward the window.

Probe
trouble

Question
Was Carl Benny’s brother?
Introduction
Shari wanted to do something new and exciting so she decided to go skydiving. She had
never done it before and was nervous. She had always been a little afraid of heights but
wanted to get over the fear. Whenever she got up high, she felt as if her brain was
spinning inside her head. When she saw how far away she was from the ground she
would get light-headed. As the plane climbed higher, she could feel herself becoming
more anxious. Finally, she heard her instructor say it was time.

Control
Shari closed her eyes and tried to calm her nerves by singing a familiar song.

Inference
Shari stood up, walked over to the edge, and looked down at the ground below.

Probe
dizzy

Question
Did Shari want to try something new?

Introduction
Jack was out with his friends. They bought a carton of eggs and his friends were taking
turns hurling eggs at passing cars. The night before they had played baseball at a nearby
field. Jack had pitched the whole night. Today his arm was very sore. It seared every
time he moved his arm. Jack felt like he was being tortured every time he moved his arm.
He watched his best friend miss one of the cars. It was now Jack’s turn to hit the next car
with an egg.

Control
Jack declined, explaining to his friends that he did not want to get in trouble.

Inference
Jack saw a car approaching so he grabbed an egg and pulled his arm back.

Probe
pain

Question
Was Jack playing with his friends?
Introduction
Amy was camping at a park in upstate New York. It was mid-August and the humidity was unbearable. Even worse, the damp air attracted all kinds of insects, especially mosquitoes. Amy was constantly smacking herself, trying to kill the pesky bugs. She hadn’t bought insect repellent, so she had to be absolutely vigilant about it. Whenever she felt anything on her skin, she would instantly smack it. Tonight she was sitting around a campfire with some friends she had made. They were talking and laughing as they roasted marshmallows.

Control
Just then, a ranger approached them and asked if they would keep their voices down.

Inference
Just then, Amy felt a little tickle and then saw a mosquito on her arm.

Probe
slap

Question
Was Amy camping in New Jersey?

Introduction
It was almost Valentine’s Day and Derek had to buy a gift for his girlfriend. He had found a beautiful ring, but it was way out of his price range. Alfred, the jeweler, was busy with another customer on the other side of the room. Alfred thought about the new robbery system he had installed. It was wired to each and every jewel case. When switched on, small sensors noticed if the jewelry shifted in any way. Sirens would sound immediately with such movements. Meanwhile, Derek was contemplating what to do.

Control
He got the jeweler’s attention and asked if he could make payments on the ring.

Inference
He checked and saw the jeweler was not looking as he picked up the ring.

Probe
alarm

Question
Was Derek getting married?
Neutral Introduction
Steven and Susan had been married for over twenty years. They met during their senior year in high school and had married when they were 19. Steven had just started a new job as the assistant manager of the accounting department at Sears. It meant a large raise and a lot of extra responsibilities. It also meant long hours and more stress. Steven and Susan were having a hard time adjusting their life to fit his schedule. Today Susan had left a mess in the kitchen which had enraged Steven.

Distractor Introduction
After years of abuse, Susan had enough. She joined a support group for battered women and told her husband, Steven, that she was going to leave him if there was even the mildest violent incident in the house. Steven was taking her seriously. He had managed to control his temper for the past month. He couldn't bear the thought of her leaving. He felt his life would be over if she left. Today Susan had left a mess in the kitchen which had enraged Steven. He felt himself losing it.

Neutral Sentence
Working hard to control his anger, Steven apologized and offered to clean her delicate vase.

Inference Evoking Sentence
Unable to control his anger, Steven threw a delicate porcelain vase against the wall.

Backgrounding
Suddenly, the doorbell rang. It was friend, Gary, returning a drill. Gary left, Steven looked at Susan.

Critical Sentences
She apologized to Steven and hugged him.
Susan understood why Steven was so angry.

Question
Did Steven leave a mess in the kitchen?
Neutral Introduction
Richard was starting a new job today repairing the roof of the Federal Courthouse. The work had needed to be done for several years but the city was short on money so it had been put off. The neglected roof was in really bad shape. It always leaked terribly when it rained. Richard had spent the last few days loading his truck with the supplies that he would need for the first week of work. On the morning the new job was starting, Richard carefully set up the scaffold.

Distractor Introduction
Richard was starting a new job today repairing the roof of the old Federal Courthouse. Few people wanted the job because the building was so tall. It was also next to a very busy pedestrian walkway. Dozens of people constantly filled the sidewalk far below. If anything were to drop from the roof, it would seriously injure a person. It was a 26-story building so even the smallest falling object could be lethal. On the morning the new job was starting, Richard carefully set up the scaffold.

Inference Evoking Sentence
As he set up he accidentally kicked an open bucket of paint from the platform.

Control Sentence
As he finished setting up he suddenly realized he forgot a bucket of paint downstairs.

Backgrounding
On his way down, the stopped at least ten times. A few later Richard walked out to the street.

Critical Sentences
He found a child playing with the paint.
Richard told the child that he needed it.

Question
Was Richard working on the U.N. Building?
Neutral Introduction
Hector had recently become intrigued with the Internet. Lately he had been talking online to a woman named Patricia. She lived near him, and they decided that they should meet in person. Hector was worried because he had not told her that he was unemployed. He had some good leads, but so far nothing solid had come through. He knew he should have just been honest with her when they first talked. They planned to meet at 4:00 p.m. today at a park near Hector's apartment. He left just before four.

Distractor Introduction
Hector had recently become intrigued with the Internet. He spent a lot of time in chat rooms and had recently met a woman named Patricia. She had planned to meet in the park that day. Hector hoped the weather would be nice. For some strange reason, his mood was highly dependent on the weather. If the sun didn't shine, he would become unhappy and mope all day. Hector knew it was absurd, but he had no control over it. Hector got dressed and then walked out to the street.

Inference Evoking Sentence
Hector noticed that it was windy and he saw dark clouds thickening in the sky.

Control Sentence
Hector noticed it was a beautiful day when he looked up and saw blue skies.

Backgrounding
He stopped at the ATM to some cash. When Hector approached the park, he saw Patricia sitting on the bench.

Critical Sentences
He cheerfully said hello and smiled at her.
Hector was happy to finally meet Patricia.

Question
Did they plan to meet at the park?
Janice and her boss, Mildred, were hiking on the Appalachian trail. They tried to get out on the weekends and enjoy the outdoors. They had stressful office jobs and found that it helped to keep some balance in their lives. Therefore, they spent their Saturday mornings getting some exercise. This was one of their favorite hikes because it had some fabulous views. They usually hiked for four hours and then ate lunch before heading back. They had just finished their lunch and Mildred was spending a few minutes enjoying a smoke.

Janice loved the outdoors and spent her free time involved in environmental causes. Janice was involved with several radical environmental groups and had been arrested a few times for violent confrontations. When she felt passionate about something, like the environment, she could become extremely angry. Today, Janice was going hiking in the woods with her boss, Mildred. Mildred seemed to have very little respect for the outdoors. Janice remained polite but hoped Mildred wouldn’t do anything to annoy her. They had taken a break and Mildred was smoking.

Mildred put out her cigarette, wrapped it in foil and placed it in her backpack.

Janice watched Mildred carelessly toss her lit cigarette in a small pile of dry leaves.

Meanwhile, Janice slipped her large backpack off. She was glad to have the heavy weight off of her shoulders.

Janice jokingly teased Mildred for smoking. Mildred laughed and began eating her lunch.

Was Mildred Janice’s boss?
Neutral Introduction
Mike was working on a construction project over at the new elementary school. They were building a beautiful new school to replace the one that had been there since the early 1920's. This building would hold the students very comfortably, compared to the cramped conditions in the old school. They were all hoping everything would be ready by September for the upcoming school year. Today Phil, the foreman, was coming over to see how they were progressing. Mike drove Phil around the construction site in his brand new truck.

Distractor Introduction
Mike was working on a construction project at the elementary school. Phil, the foreman, was visiting today to check on their progress. Phil was a moody guy and shouted quite often. He was also very picky about the tidiness of any construction site. Mike heard him screaming at one of the workers last week for leaving his soda can on the ground. Mike and his workers had spent the past two days cleaning up the site. Mike and Phil drove around the construction site in Phil’s new truck.

Control Sentence
Mike hoped Phil wouldn’t notice a box of nails that were left out that day.

Inference Evoking Sentence
Mike cringed as the tire of Phil’s new truck rolled over a box of nails.

Backgrounding
Just then, Phil's cell phone rang. After a short conversation, Phil hung up and looked out at the site.

Critical Sentences
He said he was very pleased with the site.
He thought that it looked neat and clean.

Question
Was Mike building a new school?
Neutral Introduction
Joan was enjoying her new summer job taking care of the grounds of the hotel. She loved having a job that let her spend her days outside in the sunshine. She got this job through a friend and was grateful. There were many summers before where she was stuck inside an office. She did it because she needed money then, but she hated it. Although her new job was hard work, she was paid well. Joan was trimming the hedges around the pool. The guests frequented the pool, so it's kept orderly.

Distractor Introduction
Joan was enjoying her new summer job as groundskeeper of a hotel. She preferred a job in which she spent her days outside in the sunshine. However, she had a problem with the insects. Joan hated bugs. She had an irrational fear of any kind of insect. She never understood this because she had never really had any traumatic experience. Her mother told her she had been like that all her life. The bugs were the only thing Joan didn’t like about her job. Today Joan was working around the pool.

Neutral Introduction
Just as she started her work she found an empty old beehive behind a bush.

Inference Evoking Sentence
Just as she started her work, she bumped a huge beehive and bees flew everywhere.

Backgrounding
Meanwhile, the hotel members were lounging around the pool. A group of kids were swimming in the pool.

Critical Sentences
Joan whistled happily and kept on working.
She finished and walked to the clubhouse.

Question
Was Joan the groundskeeper for a country club?
Neutral Introduction
After many years of playing bit parts in low budget movies, the actress got her big break. She had the lead female role in the new Paul Newman film. When her agent showed her the script, she immediately wanted the role. She knew she would be perfect for it. After three auditions, she beat out some of Hollywood's best new actresses. The actress was having a great time although the work was exhausting. Today they were shooting a scene of the actress on the roof of a 14-story building.

Distractor Introduction
The insurance agent had a reputation for insuring high-risk film projects. His boss ordered him to watch himself or he would be sacked because previous risks were costly to the company. Despite the warnings, he had agreed to insure the set for the new Paul Newman film. The safety crew was sloppy. If anything went wrong, it would cost him his job. Today, the agent stopped by the set to check on the cast and crew. They were shooting a scene of the actress on the roof of a 14-story building.

Control Sentence
Suddenly, the actress became dizzy and fell ill on the roof of the tall building.

Inference Evoking Sentence
Suddenly, the actress lost her footing and fell from the roof of the tall building.

Backgrounding
The insurance agent who was on the set returned to his office. He told his boss what had happened.

Critical Sentences
His boss was quite understanding about it.
The new film would just be delayed a bit.

Question
Was the film done by Paul Newman?
Neutral Introduction
Fall was finally ending and Bruce decided it was time to winterize the house. He had noticed that a few of the shingles on the roof were loose. They would not survive another Wisconsin winter in that condition. Bruce went to the hardware store and bought the supplies he needed to fix the roof. He wasn't much of a handyman, but the guy at the store assured him it was an easy job and should only take a couple hours. Bruce started the work on Saturday. He was very neat and meticulous.

Distractor Introduction
Bruce decided he needed to fix the roof on his house. Although he wasn't much of a handyman, the guy at the store assured him it was an easy job and should only take a couple of hours. However, it seemed like everything went wrong. He had made many mistakes and his equipment kept falling to the ground. Bruce was ready to give up. He vowed that if even one more small thing went wrong he would be done. He was trying to be neat and meticulous in his work.

Control Sentence
He wanted to do a good job fixing the roof to prevent any future leaks.

Inference Evoking Sentence
However, while reaching for the hammer his shirt snagged on the tooth of a nail.

Backgrounding
Meanwhile, Bruce's neighbor was watching his progress. He was impressed that Bruce was doing the roof by himself.

Critical Sentences
Bruce worked patiently until the sun set.
He felt very satisfied with his progress.

Question
Was Bruce going to watch a baseball game?
Neutral Introduction
Roxy and Jason were on an Alaskan cruise. This was their first vacation together, and they were happy they could afford it. They married young, and neither one of them had much money. Roxy had become pregnant the year they married. It was a struggle to support their child and keep their marriage going. Jason worked three jobs while Roxy cared for the baby. Her parents had agreed to babysit while they were away. Today, they were sitting on the deck enjoying the views. Suddenly, they heard a terrible sound.

Distractor Introduction
Roxy and Jason were on an Alaskan cruise. They would dock in Anchorage in another two hours. Roxy didn’t know it, but Jason had been blackmailed by smugglers to deliver some heroin to Alaska. They had threatened to murder his daughter if he didn’t get the drugs delivered by noon today. It was 9:30 AM and Jason was checking his watch. He would have just enough time to make the delivery. Jason prayed that the cruise would arrive on time. The smugglers were dangerous. Suddenly, they heard a terrible sound.

Control Sentence
One of the waiters had dropped a huge tray of coffee mugs and breakfast dishes.

Inference Evoking Sentence
An announcement was made that the cruise ship had just run into a gigantic iceberg.

Backgrounding
People around them were startled by the noise. A staff person apologized and went to find the manager.

Critical Sentences
Jason smiled as he thought of his daughter.
He couldn't believe how much he missed her.

Question
Were Roxy and Jason on a Caribbean cruise?
Neutral Introduction
Jessica was on her way home from the library. She had met with some friends for a study session for their physics exam. It was finals week and Jessica was constantly studying. Her first final would start tomorrow, first thing in the morning. After her exam she would have another two hours to study for her physics exam. She knew it would be the most difficult exam. She had studied hard because she really wanted an A in the class. Jessica rehearsed the material and didn’t notice the speedometer hit 75.

Distractor Introduction
Jessica was on her way to the library to meet up with the physics study group. They were meeting at 3 in the lobby of the library and would then decide where they wanted to study. The group was quite punctual and they never waited for anyone. Jessica needed to get there on time, otherwise she wouldn’t know where they would be for the study session. She only had a few more minutes and then the group would leave without her. Jessica pressed the gas peddle down and hit 75.

Control Sentence
A few minutes later she saw a man standing in the road, flagging her down.

Inference Evoking Sentence
A few minutes later she saw flashing lights and a cop pulled up behind her.

Backgrounding
When Jessica finally pulled into the parking lot she took the first spot she could find and ran into the library.

Critical Sentences
She arrived at the library right on time.
The group decided to study in a classroom.

Question
Was Jessica taking a chemistry class?
Neutral Introduction
Samantha was excited to be spending the day at the beach. She was getting married next month and was feeling crazed. She had most of the arrangements finished, but a million last minute details were left. Most of her family lived in South Dakota so she had arranged for their trips and gave them ideas about what to do for the few days before and after the wedding. Samantha set up on her favorite beach. It was a hot, sunny day. As Samantha lay there, her mind drifted.

Distractor Introduction
Samantha was excited to spend some time at the beach. She was getting married tomorrow and was feeling crazed. She thought an hour at the beach would help. However, Samantha had to be careful. She tended to get sun stroke very easily. If she was outside in the sun for too long, she would become violently ill. She planned on staying at the beach for no more than one hour. Samantha set up on her favorite beach. It was a hot, sunny day. As Samantha lay there, her mind drifted.

Control Sentence
She fell asleep under the shade of her large beach umbrella for over two hours.

Inference Evoking Sentence
She soon fell sound asleep and napped under the hot sun for over two hours.

Backgrounding
As Samantha slept, some children splashed in the water and built sand castles. At 4:00 Samantha finally headed home.

Critical Sentences
She arrived home feeling healthy and calm.
Her mom even told her she looked refreshed.

Question
Was Samantha going on a date?
Neutral Introduction
Marilyn recently got a new job and was excited about starting. She was meeting with the new babysitter, Pete today. She had spent three months interviewing for her new job and had almost given up hope. Finally, she found a position that she loved as the assistant curator for the Natural History Museum. She couldn't believe it when they offered her the job. Pete arrived at 1:30. Pete asked Marilyn about his daily tasks. She explained that Cocoa, the Doberman, needed to be fed once a day. Marilyn called Cocoa.

Distractor Introduction
Marilyn recently got a new job and was excited about starting. She was meeting with the new babysitter, Pete today. Marilyn worried about how Cocoa would respond to Pete. He had attacked other people in the past. If Cocoa attacked someone one more time, he would have to be put down. Marilyn loved Cocoa dearly and would be devastated if she lost him. When Pete arrived, she told him all about the dog. She explained that Cocoa, the Doberman, needed to be fed once a day. Marilyn called Cocoa.

Control Sentence
The dog walked over to Pete to sniff his hands and tried to lick him.

Inference Evoking Sentence
The dog started barking as he ran toward Pete and lunged hungrily at his ankles.

Backgrounding
Marilyn saw that Pete looked pretty frightened after the meeting. She wondered what she should do about it.

Critical Sentences
Marilyn hoped Cocoa would get used to Pete.
Cocoa was always nervous around new people.

Question
Was Marilyn starting a new job?
Neutral Introduction
Margie was having a rough day. It was only Monday and her boss was already driving her crazy with all of his demands. She could barely finish one job before he found two or three more for her to do. Margie had recruited her new assistant to help her out with all of the extra work. There was no way she would be able to finish by herself. It was past midnight before Margie finished her work. She locked up the office and headed to her car completely exhausted.

Distractor Introduction
Margie was having a rough day. It was only Monday and her boss was already driving her crazy with all of his demands. She could barely finish one job before he found two or three more for her to do. She hadn’t been able to have her lunch because she was so busy. In fact, she hadn’t had anything since breakfast at six. Margie was starving, but didn’t want to interrupt her work. It was past midnight before Margie finished her work. She headed to her car completely exhausted.

Control Sentence
She knew her boss wouldn’t even appreciate all of the extra work she had done.

Inference Evoking Sentence
Margie knew exactly what she was going to do when she finally got home.

Backgrounding
Margie drove home thinking about her day. She had a hard time getting work out of her mind after she left.

Critical Sentences
When she got home she brushed her teeth.
Afterwards, she washed her hands and face.

Question
Was Margie at work?
Neutral Introduction
Benny and his friend Carl were playing football in the living room. They were both on the varsity football team. The season had just ended. They hadn’t had a great year, but still enjoyed being on the team. Next year the team would be getting a new coach. Both guys were curious how it would turn out for the team. Benny thought that the old coach was irreplaceable. Carl tossed the ball pretty hard. Benny caught it and then threw the ball back to Carl as hard as he could.

Distractor Introduction
Benny and his friend Carl were playing football in the living room. His parents had repeatedly told him that he should not play ball in the house. They had caught him once and he had been grounded for a week. They told him if he did it again the punishment would be much worse. However, they were out of town this weekend, so he knew they would never find out. Carl tossed the ball pretty hard. Benny caught it and then threw the ball back as hard as he could.

Control Sentence
Carl caught the ball and then noticed a strange bird sitting just outside the window.

Inference Evoking Sentence
Benny’s mom came in the room as the speeding ball flew straight toward the window.

Backgrounding
Just then, Benny noticed that his mom standing in the room. Carl was still looking at the window.

Critical Sentences
She said hello and smiled at Benny's face.
Apparently they decided to come home early.

Question
Was Carl Benny’s brother?
Neutral Introduction
Shari wanted to do something new and exciting so she decided to go skydiving. She had never done it before but she loved to try new things. Her best friend Lucy had agreed to go with her. The past few days they had sat through a couple of courses instructing them on proper skydiving technique. Lucy was nervous, but Shari was just excited. Shari loved to push herself to the limit. She could feel the adrenaline as the plane climbed higher. Finally, she heard her instructor say it was time.

Distractor Introduction
Shari wanted to do something new and exciting so she decided to go skydiving. She had never done it before and was nervous. She had always been a little afraid of heights but wanted to get over the fear. Whenever she got up high, she felt as if her brain was spinning inside her head. When she saw how far away she was from the ground she would get light-headed. As the plane climbed higher, she could feel herself becoming more anxious. Finally, she heard her instructor say it was time.

Control Sentence
Shari took a deep breath and felt relieved that she hadn't volunteered to go first.

Inference Evoking Sentence
Shari stood up, walked over to the edge, and looked down at the ground below.

Backgrounding
The plane was really noisy because of the engine and the wind. The instructor's voice could barely be heard.

Critical Sentences
Shari felt herself becoming more relaxed.
She told herself that she would be fine.

Question
Did Shari want to try something new?
Neutral Introduction
Jack was out with his friends today. They had bought a carton of eggs and were sitting near the side of the road. His friends had all taken turns hurling the eggs at passing cars. They thought it was hysterical to see the drivers' faces when the egg struck their cars. They were well hidden behind some bushes, so they were fairly confident they would not get caught. So far, none of the drivers had seen them. It was now Jack's turn to hit the next car with an egg.

Distractor Introduction
Jack was out with his friends. They bought a carton of eggs and his friends were taking turns hurling eggs at passing cars. The night before they had played baseball at a nearby field. Jack had pitched the whole night. Today his arm was very sore. It seared every time he moved his arm. Jack felt like he was being tortured every time he moved his arm. He watched his best friend miss one of the cars. It was now Jack's turn to hit the next car with an egg.

Control Sentence
Jack declined, explaining to his friends that he did not want to get in trouble.

Inference Evoking Sentence
Jack saw a car approaching so he grabbed an egg and pulled his arm back.

Backgrounding
Jack's friends knew he had a strong arm, but also realized that he was probably tired from pitching the night before.

Critical Sentences
However, his arm wasn't hurting just then. He figured it just need some stretching.

Question
Was Jack standing near the edge of the road?
Neutral Introduction
Amy was camping at a park in upstate New York. It was mid-August and the humidity was unbearable. Amy was from Arizona, so she wasn’t used to the dampness. She couldn’t believe how her blankets and clothes actually felt wet. Even worse, her food was spoiling faster than she expected. Despite these problems, Amy was having a good time. She had met some nice people at the park. Tonight, she was sitting around a campfire with some of her new friends. They were talking and laughing as they roasted marshmallows.

Distractor Introduction
Amy was camping at a park in upstate New York. It was mid-August and the humidity was unbearable. Even worse, the damp air attracted all kinds of insects, especially mosquitoes. Amy was constantly smacking herself, trying to kill the pesky bugs. She hadn’t bought insect repellent, so she had to be absolutely vigilant about it. Whenever she felt anything on her skin, she would instantly smack it. Tonight she was sitting around a campfire with some friends she had made. They were talking and laughing as they roasted marshmallows.

Control Sentence
Just then, a ranger approached them and asked if they would keep their voices down.

Inference Evoking Sentence
Just then, Amy felt a little tickle and then saw a mosquito on her arm.

Backgrounding
Suddenly all of her friends became very quite around the fire. They all looked at Amy for her response.

Critical Sentences
Amy immediately started laughing about it.
She was annoyed but it was pretty funny.

Question
Was Amy camping in New Jersey?
Neutral Introduction
It was almost Valentine’s Day and Derek had to buy a gift for his girlfriend. He was low on cash and couldn’t afford anything expensive. He had found a beautiful ring, but it was way out of his price range. Alfred, the jeweler, was standing near the door talking to another customer. The man had been quite rude to Derek when he inquired about the price. Derek wondered what he should do. He didn’t think any other gift would be as nice. After much thought, he made his decision.

Distractor Introduction
It was almost Valentine’s Day and Derek had to buy a gift for his girlfriend. He had found a beautiful ring, but it was way out of his price range. Alfred, the jeweler, was busy with another customer on the other side of the room. Alfred thought about the new robbery system he had installed. It was wired to each and every jewel case. When switched on, small sensors noticed if the jewelry shifted in any way. Sirens would sound immediately with such movements. Meanwhile, Derek was contemplating what to do.

Control Sentence
He got the jeweler’s attention and asked if he could make payments on the ring.

Inference Evoking Sentence
He checked and saw the jeweler was not looking as he picked up the ring.

Backgrounding
The jeweler was momentarily distracted by another customer. It was a woman who was approached him and asked for assistance.

Critical Sentences
Derek looked at the fine ring in silence.
He knew it would make his girlfriend happy.

Question
Was Derek going to get married?
High Elaborated/Related Distractor
After years of abuse, Susan had enough. She joined a support group for battered women and told her husband, Steven, that she was going to leave him if there was even the mildest violent incident in the house. Steven was taking her seriously. He had managed to control his temper for the past month. He couldn't bear the thought of her leaving. He felt his life would be over if she left. Today Susan had left a mess in the kitchen which had enraged Steven. He felt himself losing it.

Low Elaborated (Experiment 4 only)
Steven and Susan had been married for twenty years. After years of abuse, Susan told Steven she would leave him if there was even the mildest violent incident in the house. In addition, Steven had just started a new job as the assistant manager of the accounting department at Sears. It meant a lot of extra responsibilities, long hours, and more stress. Steven and Susan were having a hard time adjusting their life to fit his schedule. Today Susan had left a mess in the kitchen which had enraged Steven.

Unrelated Distractor (Experiment 5 only)
Steven and Susan had been married for over twenty years. They met during their senior year in high school during which time Steven started working at Sears. He had been working there ever since. Yesterday, Steven found out that he had been laid off. He was absolutely devastated. He didn't know how he would take care of his wife and children. He felt an enormous amount of frustration and anxiety which made him even more stressed. Today, Susan had left a mess in the kitchen which had enraged Steven.

Control Sentence
Working hard to control his anger, Steven apologized and offered to clean her delicate vase.

Inference Evoking Sentence
Unable to control his anger, Steven threw a delicate porcelain vase against the wall.

Probe
break

Question
Did Steven leave a mess in the kitchen?
High Elaborated/Related Distractor
Richard was starting a new job today repairing the roof of the old Federal Courthouse. Few people wanted the job because the building was so tall. It was also next to a very busy pedestrian walkway. Dozens of people constantly filled the sidewalk far below. If anything were to drop from the roof, it would seriously injure a person. It was a 26-story building so even the smallest falling object could be lethal. On the morning the new job was starting, Richard carefully set up the scaffold.

Low Elaborated (Experiment 4 only)
Richard was starting a new job today repairing the roof of the Federal Courthouse. The courthouse was a 26-story building, so if anything were to drop from the roof, it would seriously injure a person. The work should have been done years ago but the city had been short on money until now. Richard had spent the last few days loading his truck with the supplies that he needed for the first week of work. On the morning the new job was starting, Richard carefully set up the scaffold.

Unrelated Distractor (Experiment 5 only)
Richard was starting a new job today repairing the roof of the old Federal Courthouse. He was a little nervous because during the walk through he noticed many electrical wires. They were scattered all over the roof. Someone assured him that the power had been turned off, but he was still concerned about getting electrocuted. His buddy was seriously injured once by an electrical shock. Richard didn’t want the same thing to happen to him. On the morning the new job was starting, Richard carefully set up the scaffold.

Control Sentence
As he finished setting up he suddenly realized he forgot a bucket of paint downstairs.

Inference Evoking Sentence
As he set up he accidentally kicked an open bucket of paint from the platform.

Probe
spill

Question
Was Richard working on the U.N. Building?
Hector had recently become intrigued with the Internet. He spent a lot of time in chat rooms and had recently met a woman named Patricia. They had planned to meet in the park that day. Hector hoped the weather would be nice. For some strange reason, his mood was highly dependent on the weather. If the sun didn’t shine, he would become unhappy and mope all day. Hector knew it was absurd, but he had no control over it. Hector got dressed and then walked out to the street.

Hector had recently met a woman named Patricia online and they had decided to meet at a park. Hector hoped the weather would be nice because when the sun didn’t shine, he would become unhappy and mope all day. Hector was also worried because he had not told her that he was unemployed. He had some good leads, but so far had come through. He knew he should have just been honest with her when they first talked. They planned to meet at 4:00, so he left just before four.

Hector had recently become intrigued with the Internet. He spent a lot of time in chat rooms and had recently met a woman named Patricia. Hector was worried because he had lied to Patricia about his looks. Hector was extremely overweight and was very embarrassed about it. He didn’t want Patricia to think differently about him because of his weight. He hoped that she would be understanding and empathetic about it. They had planned to meet at a local park. He got dressed and walked out to the street.

Hector noticed it was a beautiful day when he looked up and saw blue skies.

Hector noticed that it was windy and he saw dark clouds thickening in the sky.

Did they plan to meet at a park?
Janice loved the outdoors and spent her free time involved in environmental causes. Janice was involved with several radical environmental groups and had been arrested a few times for violent confrontations. When she felt passionate about something, like the environment, she could become extremely angry. Today, Janice was going hiking in the woods with her boss, Mildred. Mildred seemed to have very little respect for the outdoors. Janice remained polite but hoped Mildred wouldn't do anything to annoy her. They had taken a break and Mildred was smoking.

Janice and her boss, Mildred, were hiking on the Appalachian trail. Janice was a big outdoors enthusiast and would often become extremely angry and confrontational whenever anyone showed disrespect for the environment. Mildred also liked the outdoors, so they hiked on the weekends to enjoy the local scenery. Therefore, they spent their Saturday mornings hiking. This was one of their favorite hikes because it had fabulous views. They usually hiked for four hours and then ate lunch before heading back. They had taken a break and Mildred was smoking.

Janice and her boss, Mildred, were hiking on the Appalachian trail. They tried to get out on the weekend and enjoy the outdoors. Today, they were on a long hike. Mildred had needed to take a break so Janice was walking around, checking out the view. Just then, she tripped and heard a loud popping sound. She screamed and grabbed her ankle. Meanwhile, Mildred was smoking a cigarette. She was watching Janice walk around and saw her fall. She also heard her ankle pop. They immediately looked at each other.

Mildred put out her cigarette, wrapped it in foil and placed it in her backpack.

Janice watched Mildred carelessly toss her lit cigarette in a small pile of dry leaves.

Was Janice Mildred's boss?
Bob had enlisted in the Air Force just after high school. Today, he was on a top-secret mission to destroy enemy military targets. Bob had only been on one other mission and it had been miserable. He had been anxious the whole time. Immediately after attacking the site he had broken down sobbing. He couldn’t bear to think about what he had done. The tears continued for an hour the attack. Currently, Bob was nearing the enemy target. He contacted the central command unit as he reached his destination.

Bob was a pilot in the Air Force and was on a top-secret mission to destroy enemy military targets. On the last mission he had broken down sobbing after the attack and could do nothing to stop the sadness and tears. Still, he was proud to be in the Air Force because all of the men in his family had served. Bob enlisted after high school, just like his father and grandfather. Currently, Bob was nearing the enemy target. He contacted the central command unit as he reached his destination.

Bob had enlisted in the Air Force just after high school. Today, he was on a top-secret mission to destroy enemy military targets. Bob had only been on one other mission and it had been miserable. He had terrible engine problems and thought his plane might go down. Bob had been completely terrified. He had to abandon his duty and turn around. He arrived back on base just before the engine died. Currently, Bob was nearing the enemy target. He contacted the central command unit as he reached his destination.

He checked a screen to make sure that all of the bombs were properly secured. He pushed a flashing read button and two of the bombs fell from the plane.

Did Bob join the Air Force just after high school?
High Elaborated/Related Distractor
Mike was working on a construction project at the elementary school. Phil, the foreman, was visiting today to check on their progress. Phil was a moody guy and shouted quite often. He was also very picky about the tidiness of any construction site. Mike heard him screaming at one of the workers last week for leaving his soda can on the ground. Mike and his workers had spent the past two days cleaning up the site. Mike and Phil drove around the construction site in Phil’s new truck.

Low Elaborated (Experiment 4 only)
Phil was checking the construction progress at the new elementary school today. Phil was known to be picky about the tidiness of construction sites and was known to shout quite often and easily. Mike was in charge of the construction project. It was initiated to replace an old school that had been around since the early 1920s. This building would hold the students very comfortably, compared to the old school. They wanted to be done by September. Mike drove with Phil around the construction site in Phil’s brand new truck.

Unrelated Distractor (Experiment 5 only)
Mike was working on a construction project over at the new elementary school. Today had been a terrible day. He had to fire one of his workers because the guy had been caught stealing something from the property. He felt awful about it because the guy had a wife and three kids at home. He hated having control over someone’s life like that. Mike wasn’t really in the mood for the scheduled visit from Phil, the foreman. Mike drove Phil around the construction site in Phil’s brand new truck.

Control Sentence
Mike hoped Phil wouldn’t notice a box of nails that were left out that day.

Inference Evoking Sentence
Mike cringed as the tire of Phil’s new truck rolled over a box of nails.

Probe
flat

Question
Was Mike building a new school?
High Elaborated/Related Distractor
Greg had just left a party at Delta Upsilon Mu's frat house with his friend Sheila. She couldn't stop giggling about the way Greg walked across the ice. He hadn't experienced snow before and was nervous about walking across the ice. Therefore, he was always careful. Sheila found it absolutely hilarious. She would start chuckling before he even started his strange walk. When he was actually walking across the ice, she would be bent over, unable to control herself. They reached his building and he said goodbye to Sheila.

Low Elaborated (Experiment 4 only)
Greg had just left a party at Delta Upsilon Mu's frat house with his friend Sheila. She couldn't stop giggling at Greg because he did a strange walk whenever he encountered ice on the streets, which looked hysterical. Meanwhile, Greg was thinking that he was sick and tired the winter season. He felt like he hadn't seen the sun in weeks. It seemed to snow just about every other day. He and Sheila continued walking through the cold streets until they reached his apartment building, where they said goodnight.

Unrelated Distractor (Experiment 5 only)
Greg had just left a party at Delta Upsilon Mu's frat house with his friend Sheila. As they were walking, Greg noticed that Sheila was very quiet. Sheila had a huge crush on Greg but didn't know how to tell him. They had known each other for just a few months and she felt like she was in love. Sheila was trying to build up the courage to tell him about her feelings. However, she couldn't stand being rejected. They reached his building and he said goodbye to Sheila.

Control Sentence
He walked up the set of steps to the front door of his apartment building.

Inference Evoking Sentence
Sheila watched Greg as he sprinted up a few steps that were covered with ice.

Probe

slip

Question
Did Greg leave from Sigma Mu?
Elaine put a loaf of French bread in the oven and talked with her roommate Maria. She had an hour to kill before her biology final exam. This meant that right after the bread was ready, she would have just enough time to make it to the exam. Elaine hated biology because the professor was so strict. During the midterm, a student arrived two minutes late and he would not let her take the exam. Even worse, he didn’t allow make-up exams, so being late resulted in a zero.

Elaine put a loaf of French bread in the oven and talked with her roommate Maria. She had to leave right after the bread was ready because she had an exam and being late resulted in a zero. Later that night Elaine and her friend, Amanda, were going to the movies. They had been friends since their freshman year. Although they had gone separate directions since then, they were still good friends. Elaine and her roommate Maria also met many years ago, and they could talk up a storm.

Elaine put a loaf of French bread in the oven and talked with her roommate Maria. She had some time to kill before her biology final exam. Elaine hated biology class. She thought the professor was unusually strict and the material was very difficult. She wasn’t sure if she would even pass the class. She had studied very hard for this exam and hoped to do well. However, she had worked just as hard for the mid-term and got a D. She thought about this as she walked into the kitchen.

Elaine took the bread out of the oven and let it cool on the table.

Elaine realized she should have taken the bread out of the oven thirty minutes ago.

Were Elaine and Maria roommates?
High Elaborated/Related Distractor

Joan was enjoying her new summer job as groundskeeper of a hotel. She preferred a job in which she spent her days outside in the sunshine. However, she had a problem with the insects. Joan hated bugs. She had an irrational fear of any kind of insect. She never understood this because she had never really had any traumatic experience. Her mother told her she had been like that all her life. The bugs were the only thing Joan didn’t like about her job. Today Joan was working around the pool.

Low Elaborated (Experiment 4 only)

Joan was enjoying her new summer job as groundskeeper of a hotel. She did have a problem with the bugs because she had an irrational and extreme fear of any kind of insect. However, she loved having a job that let her spend her days outside in the sunshine. There were many summers before where she was stuck inside an office. Although her new job was hard work, she was paid well. Joan was trimming the hedges around the pool. The guests frequented the pool, so it's kept orderly.

Unrelated Distractor (Experiment 5 only)

Joan was enjoying her new summer job as groundskeeper of a hotel. She preferred a job in which she spent her days outside in the sunshine. However, she had a problem with the manager. He was constantly making passes at her. She confronted him about it, but he continued to pester her. Just now Joan saw him approaching her. She heard him whistle at her. He then gave her some work to do around the pool. Joan threatened to report him for lewd conduct and then walked toward the pool.

Control Sentence

Just as she started her work she found an empty old beehive behind a bush.

Inference Evoking Sentence

Just as she started her work, she bumped a huge beehive and bees flew everywhere.

Probe

sting

Question

Was Joan the groundskeeper for a country club?
High Elaborated/Related Distractor
The insurance agent had a reputation for insuring high-risk film projects. His boss ordered him to watch himself or he would be sacked because previous risks were costly to the company. Despite the warnings, he had agreed to insure the set for the new Paul Newman film. The safety crew was sloppy. If anything went wrong, it would cost him his job. Today, the agent stopped by the set to check on the cast and crew. They were shooting a scene of the actress on the roof of a 14-story building.

Low Elaborated (Experiment 4 only)
The insurance agent had just taken on the new Paul Newman film. His boss had told him that the film was high risk and if anything went wrong he would lose his job. Today, the agent stopped by the set to check on the cast and crew. He noticed the star actress seemed very excited to be there. In fact, she was having a great time although the work was exhausting. Just now, they were shooting a scene of the actress on the roof of a 14-story building.

Unrelated Distractor (Experiment 5 only)
After many years of playing bit parts in low budget movies, the actress got her big break. She had the lead female role in the new Paul Newman film. However, she didn’t realize that they wanted her to do most of the stunt work. She had bumps and bruises all over. Just two weeks ago she had sprained her ankle while they shot a particularly important scene. They had to retake that scene. Today they were shooting a scene of the actress on the roof of a 14-story building.

Control Sentence
Suddenly, the actress became dizzy and fell ill on the roof of the tall building.

Inference Evoking Sentence
Suddenly, the actress lost her footing and fell from the roof of the tall building.

Probe
dead

Question
Was the movie done by Paul Newman?
High Elaborated/Related Distractor
Bruce decided he needed to fix the roof on his house. Although he wasn't much of a handyman, the guy at the store assured him it was an easy job and should only take a couple of hours. However, it seemed like everything went wrong. He had made many mistakes and his equipment kept falling to the ground. Bruce was ready to give up. He vowed that if even one more small thing went wrong he would be done. He was trying to be neat and meticulous in his work.

Low Elaborated (Experiment 4 only)
Bruce decided he needed to fix the roof on his house. Because of all the mistakes and problems he had, Bruce vowed he would give up if one more thing went wrong. His wife was inside making him some lunch. She had decided to make him a ham and cheese sandwich and some chocolate chip cookies. She also made a large pitcher of freshly squeezed lemonade. She carefully set the food and lemonade on a tray and walked outside. Meanwhile, Bruce was trying hard to be neat and meticulous.

Unrelated Distractor (Experiment 5 only)
Fall was finally ending and Bruce decided he needed to fix the roof. He figured it would be an easy job and decided to do it himself. His wife, however, was not happy about it. Bruce had tried to do other maintenance work around the house and it was a disaster. She knew he was just too proud to admit that he was a terrible handyman. She was furious at Bruce because he refused to hire someone to do the job. Bruce started working today, trying to be neat and meticulous.

Control Sentence
He wanted to do a good job fixing the roof to prevent any future leaks.

Inference Evoking Sentence
However, while reaching for the hammer, his shirt snagged on the tooth of a nail.

Probe
rip

Question
Was Bruce going to watch a baseball game?
High Elaborated/Related Distractor
Today, Ziggy was running in the Boston marathon. His wife was very supportive of his running. She consistently attended all of the races and even brought their two kids along. At the end of each race she would embrace Ziggy and congratulate him on the great run. The greeting he received from his wife was Ziggy's favorite part of the whole race. Ziggy was pleased to see his family still came out to support him. As he passed the finish line, his legs were weak and he felt dizzy.

Low Elaborated (Experiment 4 only)
Today, Ziggy was running in the Boston marathon and his wife had come to cheer him on. She always watched his races and at the end of each race she embraced Ziggy and congratulated him on the great run. Last night, Ziggy had stocked up on carbohydrates at the runner's party. He had eaten several servings of pasta and drank plenty of water. Ziggy was happy because it was a brisk fifty degrees and there was a soft breeze. As he passed the finish line, Ziggy looked for his wife.

Unrelated Distractor (Experiment 5 only)
Today, Ziggy was running in the Boston marathon. His wife was very supportive of his running. She consistently attended all of the races and even brought their two kids along. It was difficult because the kids were very restless. It was especially hard for marathons because it always last at least eight hours. The kids were a wreck by the end of the race. However, Ziggy was still happy his family came to support him. As he passed the finish line, his legs were weak and he felt dizzy.

Control Sentence
When he saw his wife, he struggled to think of a way to thank her.

Inference Evoking Sentence
He saw his wife waiting for him and feebly struggled his way over to her.

Probe
collapse

Question
Did Ziggy's family watch the race?
Roxy and Jason were on an Alaskan cruise. They would dock in Anchorage in another two hours. Roxy didn't know it, but Jason had been blackmailed by smugglers to deliver some heroin to Alaska. They had threatened to murder his daughter if he didn't get the drugs delivered by noon today. It was 9:30 AM and Jason was checking his watch. He would have just enough to make the delivery. Jason prayed that the cruise would arrive on time. The smugglers were dangerous. Suddenly, they heard a terrible sound.

Roxy and Jason were on an Alaskan cruise. Jason had been blackmailed by smugglers who threatened to murder his daughter if he didn't deliver some heroin to Anchorage by noon. Incidentally, this was their first vacation together. They married young, and neither one of them had much money. Roxy had become pregnant the year they married. It was a struggle to get by. Jason worked three jobs while Roxy cared for the baby. Today, they were sitting on the deck enjoying the views. Suddenly, they heard a terrible sound.

Roxy and Jason were on an Alaskan cruise. The cruise was a last attempt at saving their marriage. However, Jason was spending all day gambling while Roxy was spending time with one of the staff members. Roxy was very attracted to him and knew the feeling was mutual. She ran into him on her way to breakfast and he invited her back to his room that night. She didn’t know what to do. Roxy saw Jason in the breakfast room and joined him. Suddenly, she heard a terrible sound.

One of the waiters had dropped a huge tray of coffee mugs and breakfast dishes.

An announcement was made that the cruise ship had just run into a gigantic iceberg.

Question

Were Roxy and Jason on a Caribbean cruise?
High Elaborated/Related Distractor
Jessica was on her way to the library to meet up with the physics study group. They were meeting at 3 in the lobby of the library and would then decide where they wanted to study. The group was quite punctual and they never waited for anyone. Jessica needed to get there on time, otherwise she wouldn't know where they would be for the study session. She only had a few more minutes and then the group would leave without her. Jessica pressed the gas peddle down and hit 75.

Low Elaborated (Experiment 4 only)
Jessica was on her way to the library to meet up with the physics study group. They never waited for anyone, so she needed to get there on time or she would miss some of the review. It was finals week and Jessica was constantly studying. After her first exam she would have another two hours to study for her physics exam. She knew it would be the most difficult exam. She really wanted an A in the class. Jessica rehearsed the material and didn't notice the speedometer hit 75.

Unrelated Distractor (Experiment 5 only)
Jessica was on her way to the library to meet up with the physics study group. She told her parents she would be at the library until late. However, she only planned on studying for an hour. She had a friend in college who had invited her to a huge fraternity party. Her friend said it would be the biggest bash of the year. Jessica could not miss out. She planned to meet her friend at the library. Jessica thought of the party and didn't notice the speedometer hit 75.

Control Sentence
A few minutes later she saw a man standing in the road, flagging her down.

Inference Evoking Sentence
A few minutes later she saw flashing lights and a cop pulled up behind her.

Probe
ticket

Question
Was Jessica taking a chemistry class?
Samantha was excited to spend some time at the beach. She was getting married tomorrow and was feeling crazed. She thought an hour at the beach would help. However, Samantha had to be careful. She tended to get sun stroke very easily. If she was outside in the heat for too long, she would become violently ill. She planned on staying at the beach for no more than one hour. Samantha set up on her favorite beach. It was a hot, sunny day. As Samantha lay there, her mind drifted.

Samantha was excited to spend some time at the beach. However, she had to be careful because she tended to get violently ill if she was in the sun for too long. She was getting married next month and was feeling crazed. She many of the arrangements finished, but a million last minute details were left. Most of her family lived in South Dakota so she had arranged their trips. Samantha set up on her favorite beach. It was a hot, sunny day. As Samantha lay there, her mind drifted.

Samantha was excited to spend some time at the beach. She was getting married tomorrow and was feeling crazed. She thought an hour at the beach would help. In fact, she had been having doubts about getting married. A week ago her fiancee confessed that he had been cheating on her but promised it would never happen again. Samantha was heartbroken and angry. She knew she would never trust him. Samantha set up on her favorite beach. It was a hot, sunny day. As Samantha lay there, her mind drifted.

She fell asleep under the shade of her large beach umbrella for over two hours.

She soon fell sound asleep and napped under the hot sun for over two hours.

Was Samantha going on a date?
High Elaborated/Related Distractor
Marilyn recently got a new job and was excited about starting. She was meeting with the new babysitter, Pete today. Marilyn worried about how Cocoa would respond to Pete. He had attacked other people in the past. If Cocoa attacked someone one more time, he would have to be put down. Marilyn loved Cocoa dearly and would be devastated if she lost him. When Pete arrived, she told him all about the dog. She explained that Cocoa, the Doberman, needed to be fed once a day. Marilyn called Cocoa.

Low Elaborated (Experiment 4 only)
Marilyn recently got a new job and was meeting with the new babysitter, Pete. However, she was concerned because if her Doberman, Cocoa, attacked someone one more time he would have to be put down. Still, she was excited about her job as assistant curator for the National History Museum. She was unemployed for months and was thrilled when they offered her the job. Pete arrived at 1:30. Pete asked Marilyn about his daily tasks. She explained that Cocoa needed to be fed once a day. Marilyn called Cocoa.

Unrelated Distractor (Experiment 5 only)
Marilyn recently got a new job and was excited about starting. She was meeting with the new babysitter, Pete today. Marilyn worried about how her son would respond to Pete. The child was extremely sensitive to new people. She had interviewed other sitters, but her son screamed and ran away from them when they said hello. She didn’t know what to do about it. During the meeting, he asked about his daily tasks. She explained that Cocoa, the Doberman, needed to be fed once a day. Marilyn called Cocoa.

Control Sentence
The dog walked over to Pete to sniff his hands and tried to lick him.

Inference Evoking Sentence
The dog started barking as he ran toward Pete and lunged hungrily at his ankles.

Probe
bite

Question
Was Marilyn starting a new job?
Sophie had listened to her daughters, Jill and Kayla, fighting all morning. Their petty arguments were driving her crazy. Sophie gave them a final warning that if they got into even the smallest argument, they would get smacked on the bottom. Although Sophie did not physically punish the girls often, she had been pushed to her limit. The girls were currently playing with their dolls in the living room. Sophie heard Kayla politely asking Jill to let her have the red-haired doll. Jill told Kayla she could have another doll instead.

Sophie had listened to her daughters, Jill and Kayla, fighting all morning. Sophie gave them a final warning that if they got into even the smallest argument, they would get smacked on the bottom. Sophie never understood the sibling rivalry between them. She tried very hard to give the girls equal amounts of attention. In her family, her mother had always preferred her younger brother and she hated it. Sophie heard Kayla ask Jill to let her have the red-haired doll. Jill told Kayla she could have another doll instead.

Sophie had listened to her daughters, Jill and Kayla, fighting all morning. Sophie was in her office, ignoring them. She had a deadline coming up for a big project she was doing. The project was bringing in a lot of money, so it was important that everything be perfect. Therefore, Sophie had been busy with work. The girls were currently playing with their dolls in the living room. Sophie heard Kayla politely asking Jill to let her have the red-haired doll. Jill told Kayla she could have another doll instead.

Kayla agreed to have the other doll if her doll could wear the pink dress.

Kayla screamed at Jill as she tightened her arm and pulled back a closed fist.

Was Sophie the mother?
Margie was having a rough day. It was only Monday and her boss was already driving her crazy with all of his demands. She could barely finish one job before he found two or three more for her to do. She hadn’t been able to have her lunch because she was so busy. In fact, she hadn’t had anything since breakfast at six. Margie was starving, but didn’t want to interrupt her work. It was past midnight before Margie finished her work. She headed to her car completely exhausted.

Low Elaborated (Experiment 4 only)
Margie was having a rough day because her boss was already driving her crazy with all of his demands. She was very hungry because she hadn’t found time for lunch or even a snack as she was so swamped with work. Margie had recruited her new assistant to help her out with all of the extra work. There was no way she would be able to finish by herself. It was past midnight before Margie finished her work. She locked up the office and headed to her car completely exhausted.

Unrelated Distractor (Experiment 5 only)
Margie was having a rough day. It was only Monday and her boss was already driving her crazy with all of his demands. Her boss had recently told her that he was impressed with her work and had hinted at a big raise. Margie could really use the extra money because she had just bought a house. She was working extra hard since her boss spoke to her. She was careful not to complain. It was past midnight before Margie finished her work. She headed to her car completely exhausted.

Control Sentence
She knew her boss wouldn’t even appreciate all of the extra work she had done.

Inference Evoking Sentence
Margie knew exactly what she was going to do when she finally got home.

Probe
bed

Question
Was Margie busy at work?
High Elaborated/Related Distractor
Kristi and Keith were getting married today. Keith had been a nervous wreck all morning. It didn’t help any that it was 95 degrees inside the church. The heat was starting to get to him. Furthermore, he had skipped breakfast that morning because he was anxious about being in front of everyone. He was feeling light-headed and dizzy. He was worried that seeing Kristi’s worried face would cause him to pass out. Keith breathed deeply, trying to relax. Kristi knew something was wrong but didn’t know what to do.

Low Elaborated (Experiment 4 only)
Kristi and Keith were getting married today. Keith was feeling light-headed and dizzy, probably because it was 95 degrees in the church and because he was a nervous wreck. Kristi couldn’t believe that the day had finally come. They had set the date two years ago. She hadn’t liked the idea of a long engagement, but Keith was in the army and was stationed overseas. Kristi was very happy and excited to be marrying Keith. Kristi’s grandmother started crying when she saw Kristi and Keith standing at the altar.

Unrelated Distractor (Experiment 5 only)
Kristi and Keith were getting married today. Keith had been a nervous wreck all morning. He knew he wanted to be with Kristi, but the idea of marriage had always sent him running. Kristi had to be the one, but he just couldn’t shake the nervousness he felt. He talked to Kristi about it the night before and she got pretty upset. She didn’t want to get married if he wasn’t sure. Keith breathed deeply, trying to relax. Kristi knew something was wrong but didn’t know what to do.

Control Sentence
Having just finished reciting their vows, Kristi and Keith slowly turned toward the minister.

Inference Evoking Sentence
Having just finished reciting their vows, Kristi and Keith slowly turned toward each other.

Probe
kiss

Were Kristi and Keith getting married?
High Elaborated/Related Distractor
Benny and his friend Carl were playing football in the living room. His parents had repeatedly told him that he should not play ball in the house. They had caught him once and he had been grounded for a week. They told him if he did it again the punishment would be much worse. However, they were out of town this weekend, so he knew they would never find out. Carl tossed the ball pretty hard. Benny caught it and then threw the ball back as hard as he could.

Low Elaborated (Experiment 4 only)
Benny and his friend Carl were playing football in the living room. His parents had warned him that if they ever caught him playing ball in the house he would be punished severely. Benny absolutely loved football. He and Carl were on the varsity team. Next year the team would be getting a new coach. Benny didn't like it because he thought that the old coach was irreplaceable. Carl tossed the ball pretty hard. Benny caught it and then threw the ball back to Carl as hard as he could.

Unrelated Distractor (Experiment 5 only)
Benny and his friend Carl were playing football in the living room. Carl had a terrible day. He just found out that he failed his pre-calculus exam. Two weeks ago, his parents had threatened to punish him severely if he failed one more exam. Benny thought it might help to toss the ball around for awhile. He knew Carl was dreading going home and facing his parents that evening. Carl threw the ball pretty hard. Benny caught it and then threw the ball back as hard as he could.

Control Sentence
Carl almost didn't catch the ball because he was watching a bird outside the window.

Inference Evoking Sentence
Benny's mom came in the room as the speeding ball flew straight toward the window.

Probe
smash

Question
Was Carl Benny's brother?
Shari wanted to do something new and exciting so she decided to go skydiving. She had never done it before and was nervous. She had always been a little afraid of heights but wanted to get over the fear. Whenever she got up high, she felt as if her brain was spinning inside her head. When she saw how far away she was from the ground she would get light-headed. As the plane climbed higher, she could feel herself becoming more anxious. Finally, she heard her instructor say it was time.

Shari wanted to do something new and exciting so she decided to go skydiving. She was nervous and scared because whenever she got up high, she felt as if her head was spinning and would get light-headed. Her best friend Lucy had agreed to go with her. The past few days they had sat through a couple of courses instructing them on proper skydiving technique. Shari loved to push herself to the limit. She could feel the adrenaline as the plane climbed. Finally, she heard her instructor say it was time.

Shari wanted to do something new and exciting so she decided to go skydiving. She told her boyfriend about it and he got very upset. He never understood why she wanted to do such crazy things. He begged her not to go, but she wouldn’t listen. He was crying this morning when she left. She tried to console him, but there was nothing she could do. She left him in tears. She was on the plane and could feel the excitement. Finally, she heard the instructor say it was time.

Shari closed her eyes and tried to calm her nerves by singing a familiar song.

Shari stood up, walked over to the edge, and looked down at the ground below.

Did Shari want to try something new?
High Elaborated/Related Distractor
Jack was out with his friends. They bought a carton of eggs and his friends were taking turns hurling eggs at passing cars. The night before they had played baseball at a nearby field. Jack had pitched the whole night. Today his arm was very sore. It seared every time he moved his arm. Jack felt like he was being tortured every time he moved his arm. He watched his best friend miss one of the cars. It was now Jack’s turn to hit the next car with an egg.

Low Elaborated (Experiment 4 only)
Jack and his friends had bought a carton of eggs and were taking turns hurling eggs at passing cars. Last night Jack had pitched for a baseball game and his arm was very sore and burned every time he moved it. Nevertheless, he was enjoying himself with his buddies today. They all thought it was hysterical to see the drivers’ faces when the egg struck their cars. So far, none of the drivers had seen them. It was now Jack’s turn to hit the next car with an egg.

Unrelated Distractor (Experiment 5 only)
Jack was out with his friends. They bought a carton of eggs and his friends were taking turns hurling eggs at passing cars. Jack was distracted remembering what happened the night before. His mom was pregnant and had gone to the hospital because her water had broke. His aunt had come over to babysit. Jack found out that he had a new baby sister. He would meet her this evening. Suddenly, he heard his friends calling his name. It was Jack’s turn to hit the next car with an egg.

Control Sentence
Jack declined, explaining to his friends that he did not want to get in trouble.

Inference Evoking Sentence
Jack saw a car approaching so he grabbed an egg and pulled his arm back.

Probe
throw

Question
Was Jack with his friends?
High Elaborated/Related Distractor
Amy was camping at a park in upstate New York. It was mid-August and the humidity was unbearable. Even worse, the damp air attracted all kinds of insects, especially mosquitoes. Amy was constantly smacking herself, trying to kill the pesky bugs. She hadn’t bought insect repellent, so she had to be absolutely vigilant about it. Whenever she felt anything on her skin, she would instantly smack it. Tonight she was sitting around a campfire with some friends she had made. They were talking and laughing as they roasted marshmallows.

Low Elaborated (Experiment 4 only)
Amy was camping at a park in upstate New York and the humidity was unbearable. The damp air seemed to attract millions of mosquitoes and Amy was constantly smacking herself, trying to kill the pesky bugs. Amy was from Arizona, so she wasn’t used to humidity. She couldn't believe that clothes actually felt wet. Nevertheless, Amy was having a good time. She had made some wonderful new friends. Tonight, she was sitting around a campfire with her new friends. They were talking and laughing as they roasted marshmallows.

Unrelated Distractor (Experiment 5 only)
Amy was camping at a park in upstate New York. It was mid-August and the humidity was unbearable. Amy was from Arizona, so she wasn’t used to the dampness. It seemed that the humid weather was actually making her ill. In fact, she had spent the last few days in bed. Someone warned her that the heat mixed with humidity sometimes made people quite sick. Tonight, she was feeling better and had decided to join some friends around a campfire. They were talking and laughing as they roasted marshmallows.

Control Sentence
Just then, a ranger approached them and asked if they would keep their voices down.

Inference Evoking Sentence
Just then, Amy felt a little tickle and then saw a mosquito on her arm.

Probe
itch

Question
Was Amy camping in New Jersey?
High Elaborated/Related Distractor
It was almost Valentine’s Day and Derek had to buy a gift for his girlfriend. He had found a beautiful ring, but it was way out of his price range. Alfred, the jeweler, was busy with another customer on the other side of the room. Alfred thought about the new robbery system he had installed. It was wired to each and every jewel case. When switched on, small sensors noticed if the jewelry shifted in any way. Sirens would sound immediately with such movements. Meanwhile, Derek was contemplating what to do.

Low Elaborated (Experiment 4 only)
Derek was at a jewelry store and had found a ring for his girlfriend that was way out of his price range. He didn’t know that the store had a system in which sirens went off if the jewelry was moved from the case. Alfred, the jeweler, was standing near the door talking to another customer. Alfred had been quite rude to Derek when he inquired about the price. Derek wondered what he should do. He didn't think any other gift would do. After much thought, he made his decision.

Unrelated Distractor (Experiment 5 only)
It was almost Valentine’s Day and Derek had to buy a gift for his girlfriend. He had found a beautiful ring, but it was way out of his price range. Alfred, the jeweler, was busy with another customer on the other side of the room. The customer was being totally obnoxious. She had bought a watch at another store and expected Alfred to accept the other store’s guarantee policy. Alfred tried to be respectful, but he was losing patience with the woman. Meanwhile, Derek was contemplating what to do.

Control Sentence
He got the jeweler’s attention and asked if he could make payments on the ring.

Inference Evoking Sentence
He checked and saw the jeweler was not looking as he picked up the ring.

Probe
steal

Question
Was Derek looking at a necklace?
APPENDIX F

IRB Approval

University of New Hampshire
Institutional Review Board for the Protection of Human Subjects in Research
Departmental Review Committee Exemption Classification Sheet

<table>
<thead>
<tr>
<th>Project Director</th>
<th>Edward O'Brien</th>
<th>IRB #</th>
<th>62</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department</td>
<td>Psychology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project Title</td>
<td>A replication essay on gender bias in...</td>
<td></td>
<td></td>
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</tbody>
</table>

Reviewer: Please write comments or contingencies of approval, if any, on a separate sheet of paper, and attach to the form. Place the completed form on file with the application for review, in the Departmental Review Committee files. Protocol applications and review forms will be forwarded to the Office of Sponsored Research each semester for reporting purposes.

- Protocol qualifies as EXEMPT under the following subsection(s) (check one) - see reverse for detailed category description:
  - 46.101(b)(1) Research conducted in established educational setting using normal educational procedures
  - 46.101(b)(2) Educational tests, surveys, interviews, observation of public behavior, risk
  - 46.101(b)(3) Educational tests, surveys, interviews, observation of public behavior not exempt under Subsection 2, above, if public official or if confidentiality mandated by federal statute
  - 46.101(b)(4) Study of existing data
  - 46.101(b)(5) Study of public benefits or service programs
  - 46.101(b)(6) Taste and food studies

- Refer protocol to the regular IRB for EXPEDITED review under the following subsection(s) (check one):
  - 46.110(b)(1) Clinical studies of drugs/medical devices not requiring investigational new drug/device applications.
  - 46.110(b)(2) Collection of blood samples by finger, heel, or ear stick, or venipuncture in healthy adults >110 lbs., or others and children, considering age, weight, health, collection procedure, frequency and amount of collection.
  - 46.110(b)(3) Prospective collection of biological specimens for research purposes by noninvasive means, and in a non-invasive manner; hair and nail clippings, teeth, sweat, saliva, placenta (after delivery), amniotic fluid (at membrane rupture/date), dental plaque/ calculus, mucosal/skin cells, sputum (after saline nebulization)
  - 46.110(b)(4) Collection of data through noninvasive means routinely employed in clinical practice (excluding x-rays and microwaves, and devices not approved for marketing); physical sensors applied to the skin, weighing, tests of visual acuity, MRI, EKG, EEG, ultrasound, etc., and moderate exercise by healthy volunteers.
  - 46.110(b)(5) Non-exempt research involving data, documents, records or specimens that have been/will be obtained solely for non-research purposes (e.g., medical treatment or diagnosis).
  - 46.110(b)(6) Collection of data from voice, video, digital, or image recordings made for research purposes.
  - 46.110(b)(7) Non-exempt research on individual or group behavior or characteristics of individuals, such as studies of perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior, or research employing surveys, oral histories, focus groups, program evaluation, human factors evaluation, or quality assurance methodologies.
  - 46.110(b)(8) Continuing review of research such as studies permanently closed to enrollment of new subjects, or for which research-related interventions are completed, or for which only long-term follow-up of subjects remains, or for which no subjects have been enrolled and no additional risks have been identified, or for which data analysis is the only remaining research activity.
  - 46.110(b)(9) Continuing review of research (not conducted under investigational drug/device applications or exemption) where categories 2 through 8, above, do not apply, and for which the IRB has determined that the research involves no greater than minimal risk, and no additional risks have been identified.

- Refer protocol to the regular IRB for FULL BOARD action (cite reason on separate sheet)

IRB Reviewer: John Sanders
Date: 9/17/04

* Please add the number of qualities to continue.
University of New Hampshire
Institutional Review Board for the Protection of Human Subjects in Research
Departmental Review Committee Exemption Classification Sheet

Project Director: [Redacted]
Department: Psychology
Project Title: [Redacted]
IRB Authority: [Redacted]

Reviewer: Please write comments or contingencies of approval, if any, on a separate sheet of paper, and attach to this form. Place the completed form on file with the application for review, in the Departmental Review Committee files. Protocol applications and review forms will be forwarded to the Office of Sponsored Research each semester for reporting purposes.

Protocol qualifies as EXEMPT under the following subsection (check one) - see reverse for detailed category description:

☐ 46.101(b)(1) Research conducted in established educational setting using normal educational procedures
☐ 46.101(b)(2) Educational tests, surveys, interviews, observation of public behavior/no risk
☐ 46.101(b)(3) Educational tests, surveys, interviews, observation of public behavior not exempt under Subsection 2, above, if public official or if confidentiality mandated by federal statutes
☐ 46.101(b)(4) Study of existing data
☐ 46.101(b)(5) Study of public benefits or service programs
☐ 46.101(b)(6) Taste and food studies

☐ Refer protocol to the regular IRB for EXPEDITED review under the following subsection (check one):

☐ 46.110(b)(1) Clinical studies of drugs/medical devices not requiring investigational new drug/device applications.
☐ 46.110(b)(2) Collection of blood samples by finger, heel or ear stick, or venipuncture in healthy adults >110 lbs., or others and children, considering age, weight, health, collection procedure, frequency and amount of collection.
☐ 46.110(b)(3) Prospective collection of biological specimens for research purposes by noninvasive means, and in a non-disfiguring manner: hair and nail clippings, teeth, sweat, saliva, placenta (after delivery), amniotic fluid (after membrane rupture/labor), dental plaque/calculus, mucosal/dental cells, sputum (after saline nebulization)
☐ 46.110(b)(4) Collection of data through noninvasive means routinely employed in clinical practice (excluding x-rays and microwaves, and devices not approved for marketing): physical sensors applied to the skin, weighing, tests of visual acuity, MRI, EEG, ultrasound, etc., and moderate exercise by healthy volunteers.
☐ 46.110(b)(5) Non-exempt research involving data, documents, records or specimens that have been/will be collected solely for nonresearch purposes (e.g., medical treatment or diagnosis).
☐ 46.110(b)(6) Collection of data from voice, video, digital, or image recordings made for research purposes.
☐ 46.110(b)(7) Non-exempt research on individual or group behavior or characteristics of individuals, such as studies of perception, cognizance, motivation, identity, language, communication, cultural beliefs or practices, and social behavior, or research employing surveys, interviews, oral histories, focus groups, program evaluation, human factors evaluation, or quality assurance methodologies.
☐ 46.110(b)(8) Continuing review of research such as studies permanently closed to enrollment of new subjects, or for which research-related interventions are completed, or for which only long-term follow-up of subjects remains, or for which no subjects have been enrolled and no additional risks have been identified, or for which data analysis is the only remaining research activity.
☐ 46.110(b)(9) Continuing review of research (not conducted under investigational drug/device applications or exemption) where categories 2 through 8, above, do not apply, and for which the IRB has determined that the research involves no greater than minimal risk, and no additional risks have been identified.

☐ Refer protocol to the regular IRB for FULL BOARD action (cite reason on separate sheet)

☐ Protocol cannot be approved as presented (cite reason on separate sheet)

IRB Authority: [Redacted]
Date: 10/13/04

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Protocol qualifies as EXEMPT under the following subsection (check one) - see reverse for detailed category description:

46.101(b)(1) Research conducted in established educational setting using normal educational procedures
46.101(b)(2) Educational tests, surveys, interviews, observation of public behavior/no risk
46.101(b)(3) Educational tests, surveys, interviews, observation of public behavior not exempt under Subsection 2, above, if public official or if confidentiality mandated by federal statutes
46.101(b)(4) Study of existing data
46.101(b)(5) Study of public benefits or service programs
46.101(b)(6) Taste and food studies

Refer protocol to the regular IRB for EXPEDITED review under the following subsection (check one):

46.110(b)(1) Clinical studies of drug/medical devices not requiring investigational new drug/device applications.
46.110(b)(2) Collection of blood samples by finger, heel or ear stick, or venipuncture in healthy adults >110 lbs., or others and children, considering age, weight, health, collection procedure, frequency and amount of collection.
46.110(b)(3) Prospective collection of biological specimens for research purposes by noninvasive means, and in a non-disfiguring manner: hair and nail clipplings, teeth, sputum, placenta (after delivery), amniotic fluid (after membrane rupture/labor), dental plaque/calcium, mucosal/skin cells, hair, sweat, saliva, (after saline nebulization)
46.110(b)(4) Collection of data through noninvasive means routinely employed in clinical practice (excluding x-rays and microwaves, and devices not approved for marketting): physical sensors applied to the skin, weighing, tests of visual acuity, MRI, EKG, EEG, ultrasound, etc., and moderate exercise by healthy volunteers.
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Refer protocol to the regular IRB for FULL BOARD action (cite reason on separate sheet)

Protocol cannot be approved as presented (cite reason on separate sheet)
University of New Hampshire
Institutional Review Board for the Protection of Human Subjects in Research
Departmental Review Committee Exemption Classification Sheet

Name: Mary Herman
Dept: Psychology
Study: Measuring differences with reading time
IRB #: 17

Exempt Review
46.101(b)(1) Research conducted in established or commonly accepted educational settings, involving normal educational practices, such as:
1. (i) research on regular or special educational instructional strategies, or
(ii) research on the effectiveness of or comparison among instructional techniques, curricula, or classroom management methods.

46.101(b)(2) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior unless:
(i) information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and
(ii) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to subjects' financial standing, employability, or reputation.

46.101(b)(3) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior that is not exempt under category (b)(2):
(i) the human subjects are elected or appointed public officials or candidates for public office; or
(ii) federal statute(s) require(s) without exception that confidentiality of the personally identifiable information will be maintained throughout the research and thereafter.

46.101(b)(4) Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens, if these sources are publicly available or if the information is recorded by the investigator in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects.

46.101(b)(5) Research and demonstration projects which are conducted by or subject to the approval of department or agency heads, and which are designed to study, evaluate, or otherwise examine: (i) public benefit or service programs; (ii) procedures for obtaining benefits or services under those programs; (iii) possible changes in or alternatives to those programs or procedures; or (iv) possible changes in methods or levels of payment for benefits or services under those programs.

46.101(b)(6) Taste and food quality evaluation and consumer acceptance studies, if wholesome foods without additives are consumed or if a food is consumed that contains a food ingredient at or below the level and for a use found to be safe, or agricultural chemical or environmental contaminant at or below the level found to be safe, by the Food and Drug Administration, or approved by the Environmental Protection Agency, or the Food Safety and Inspection Service of the U.S. Department of Agriculture.

Protocol is approved as presented in the category checked
Protocol is approved with the following contingencies/comments (attach sheets if necessary)
Protocol is referred to the IRB for Expedited or Full Board review
Protocol cannot be approved as presented (cite reasons on separate sheet)

OIR Reviewer: John Sanders  Date: 7/11/05
Exempt Review

46.101(b)(1) Research conducted in established or commonly accepted educational settings, involving normal educational practices, such as:
- (i) research on regular or special educational instructional strategies, or
- (ii) research on the effectiveness of or comparison among instructional techniques, curricula, or classroom management methods.

46.101(b)(2) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior unless:
- (i) information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and
- (ii) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to subjects' financial standing, employability, or reputation.

46.101(b)(3) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior that is not exempt under category (b)(2) if:
- (i) the human subjects are elected or appointed public officials or candidates for public office; or
- (ii) federal statute(s) requires confidentiality of the personally identifiable information will be maintained throughout the research and thereafter.

46.101(b)(4) Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens, if these sources are publicly available or if the information is recorded by the investigator in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects.

46.101(b)(5) Research and demonstration projects which are conducted by or subject to the approval of department or agency heads, and which are designed to study, evaluate, or otherwise examine:
- (i) public benefit or service programs; (ii) procedures for obtaining benefits or services under those programs; (iii) possible changes in or alternatives to those programs or procedures; or (iv) possible changes in methods or levels of payment for benefits or services under those programs.

46.101(b)(6) Taste and food quality evaluation and consumer acceptance studies, if wholesome foods without additives are consumed or (ii) if a food is consumed that contains a food ingredient at or below the
level and for a use found to be safe, or agricultural chemical or environmental contaminant at or below the level found to be safe, by the Food and Drug Administration, or approved by the Environmental Protection Agency, or the Food Safety and Inspection Service of the U.S. Department of Agriculture.

Protocol is approved as presented in the category checked
Protocol is approved with the following contingencies/comments (attach sheets if necessary)
Protocol is referred to the IRB for Expedited or Full Board review
Protocol cannot be approved as presented (cite reasons on separate sheet)
University of New Hampshire
Institutional Review Board for the Protection of Human Subjects in Research
Departmental Review Committee Exemption Classification Sheet

Name: Edward O'Brien
Dept: Psychology
Study: Exempt

Exempt Review
46.101(b)(1) Research conducted in established or commonly accepted educational settings, involving normal educational practices, such as:
- [ ] research on regular or special educational instructional strategies, or
- [ ] research on the effectiveness of or comparison among instructional techniques, curricula, or classroom management methods.

46.101(b)(2) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior unless:
- [ ] information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and
- [ ] any disclosure of the human subjects’ responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to subjects’ financial standing, employability, or reputation.

46.101(b)(3) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior that is not exempt under category (b)(2) if:
- [ ] the human subjects are elected or appointed public officials or candidates for public office; or
- [ ] federal statutes require without exception that confidentiality of the personally identifiable information will be maintained throughout the research and thereafter.

46.101(b)(4) Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens, if these sources are publicly available or if the information is recorded by the investigator in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects.

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- [ ] public benefit or service programs;
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- [ ] possible changes in or alternatives to those programs or procedures; or
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46.101(b)(6) Taste and food quality evaluation and consumer acceptance studies, (i) if wholesome foods without additives are consumed or (ii) if a food is consumed that contains a food ingredient at or below the level and for a use found to be safe, or agricultural chemical or environmental contaminant at or below the level found to be safe, by the Food and Drug Administration, or approved by the Environmental Protection Agency, or the Food Safety and Inspection Service of the U.S. Department of Agriculture.

Protocol is approved as presented in the category checked
Protocol is approved with the following contingencies/comments (attach sheets if necessary)
Protocol is referred to the IRB for Expedited or Full Board review
Protocol cannot be approved as presented (cite reasons on separate sheet)

DRC Reviewer: [Signature]
Date: 4/04/05

157

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