

Context breeds false recognition for indeterminate sentences.

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ABSTRACT

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Over the last decade, there has been considerable debate concerning the processes governing the comprehension of indeterminate sentences such as (A) *Lisa began the book*, and how they come to be understood as something like (B) *Lisa began reading the book*. A major theme in this debate concerns the role of context in facilitating comprehension. Research shows that the costs associated with processing indeterminate expressions (e.g., McElree et al., 2001) are attenuated when these sentences are preceded by a sufficiently supporting context (de Almeida, 2004). A plausible explanation for this observation is that context facilitates comprehension by activating knowledge in support of inferential processes. This view lies in contrast to the *coercion* hypothesis, for which indeterminate sentences are enriched by default as a function of retrieving internal properties of the nominal *book* (Pustejovsky, 1995). In the present study, we employed a discourse-based sentence recognition paradigm (Sachs, 1967), investigating whether a strongly biasing context facilitates comprehension of indeterminate sentences. Our goal was to determine whether the interpretation of indeterminate sentences is facilitated by context manipulations that tap into inferential processes rather than constituent features of the complement noun. We found that participants ($N = 72$) drew systematic inferences from the context to the extent that they recognized sentences such as (B) from the discourse, when in fact, they were only exposed to indeterminate sentences such as (A). These results were obtained when proposed elements of the *coercion* hypothesis were

experimentally and statistically controlled, suggesting that context facilitates comprehension of indeterminate sentences by triggering pragmatic inferences.

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Context breeds false recognition for indeterminate sentences.

In everyday language comprehension, individuals are often forced to infer meaning that is not explicitly stated. One such challenge for the language comprehension system concerns indeterminate sentences such as (1a), for which the activity presumed to have been initiated—precisely what Mary started doing with the book—is not expressed. In such instances, hearers presumably deploy special processes to determine the nature of the event implied by the sentence, assigning it a representation that might look something like (1b).

- (1) a. *Indeterminate verb phrase*: Mary started the book.
 b. *Fully-determinate verb-phrase*: Mary started *reading* the book.

The processes underlying the interpretation of indeterminate expressions has been the subject of much empirical investigation over the last decade, with research typically showing that sentences such as (1a) are costly to process (McElree et al., 2001; McElree, Frisson, & Pickering, 2006; Pickering, McElree, & Traxler, 2005; Traxler et al., 2002). The mechanism driving this cost, however, has yet to be understood. Several accounts have been proposed, each attributing different roles to syntactic, semantic, and pragmatic processes during indeterminate sentence comprehension (Pustejovsky, 1995; Jackendoff, 1997; Traxler, 2005; Fodor & Lepore, 1998; de Almeida & Dwivedi, 2008). There is general consensus, however, that understanding (1a) as something like (1b) depends on the context in which the utterance is expressed. That is, what one understands about the event that Mary started doing with the book—as to whether it was reading, writing, or even burning—might vary according to the knowledge that the hearer/reader has about the context of the utterance. For instance, if we have knowledge that Mary is planning to

read a book, then (1a) is best understood as (1b), but if Mary is a writer, perhaps we can best understand (1a) as being about *starting to write the book*. In the present paper, we report an experiment in which we investigated the role of context in guiding the interpretation of sentences such as (1a), aiming to understand the key mechanisms driving the comprehension of indeterminacy.

Early theoretical work (Pustejovsky, 1995; Pustejovsky & Boguraev, 1996; Jackendoff, 1997) on indeterminate constructions was motivated by the observation that classical compositionality appears to break down for these types of expressions. Classical compositionality is the principle that sentence meaning is purely denotational, being derived strictly as a function of an expression's constituents (lexical items) and how they are put together (syntax) (e.g., Frege, 1923; Fodor & Lepore, 2002; Pelletier, 1994). When utterances are indeterminate as in (1a), classical compositionality appears to be insufficient to account for the meaning of the sentence because it cannot independently generate enriched interpretations such as (1b). In such instances, some additional processing might be required for individuals to extract meaning from the sentence that is not strictly represented in its denotational form. Pustejovsky (1995) and others (e.g., Brisocoe, Copestake, & Boguraev, 1990; Jackendoff, 1997) have therefore proposed an *enriched* form of compositionality, which is hypothesized to compose such meaning during online sentence processing.

In particular, enriched composition involves a semantic operation dubbed *coercion*, or *type-coercion*, which is triggered by a hypothetical semantic mismatch inherent in indeterminate verb-phrases (VP). The mismatch occurs when an event-selecting verb such as *start* or *finish* is paired with an entity-denoting complement (e.g.,

started the book), rather than an event-denoting complement (e.g., *started the fight*). The hypothesis is that these verbs are marked by semantic restrictions that *coerce* entity-denoting nominals into events, such that the sentence *Mary started the book* is interpreted as *Mary started an event involving the book*. The event *per se* is garnered from the lexical entry of the object. The assumption goes that couched within our lexical representation of *book* is the knowledge that the object is used for *reading*. It is further assumed that such information is extracted during online sentence comprehension, such that the entity *the book* is interpreted as the event *reading the book*. In this sense, the *coercion* operation represents a lexically-driven theory of composing sentence meaning that, in contrast to classical compositionality, extends beyond the mere denotation of a sentence.

Several studies (McElree et al., 2001; Traxler et al., 2002; Pickering, McElree, & Traxler, 2005; McElree, Frisson, & Pickering, 2006) comparing indeterminate sentences such as (2a) to fully-determinate controls such as (2b) have demonstrated that the former take longer to process at various regions of the sentence, including the noun-phrase *the book* (Traxler et al., 2002) and the preposition *in* (McElree et al., 2001). These data have largely been taken as evidence for the coercion operation, which is presumed to require additional resources during online sentence processing.

- (2) a. *Indeterminate*: The author was *starting* the book in his house on the island.
b. *Control*: The author was *writing* the book in his house on the island.

Others have cautioned, however, that longer reading times may reflect an alternative means of interpretation (de Almeida, 2004; de Almeida & Dwivedi, 2008). In contrast to Pustejovsky's (1995) account of enriched composition, de Almeida and Dwivedi (2008) have suggested that sentence meaning is constrained by the processes of

classical compositionality, and becomes enriched (if at all) via pragmatic operations that are triggered only after the denotational meaning of a sentence is extracted (see also Fodor & Lepore, 1998). Accordingly, they have proposed that expressions such as (2a) remain indeterminate at a linguistic level of analysis, and that processing costs reflect the pragmatic effort required to infer the intended meaning of the expression (e.g., de Almeida, 2004; de Almeida & Dwivedi, 2008).

A major point of contention between these two accounts concerns the role of context during the process of indeterminate sentence comprehension. According to proponents of enriched composition, context aids in the selection of an appropriate event sense for the indeterminate expression (Pustejovsky, 1995; Lapata, Keller, & Scheepers, 2003). By this view, lexical representations of nominals such as *book* carry an inventory of semantic roles that can be variously plucked out during the coercion process depending on the contextual demands of the sentence. For instance, nominals carry a *telic* role which represents the primary function of the object (e.g., books are primarily used for *reading*), and they also carry an *agentive* role (among others) which stipulates how the object originates (e.g., books are *written* into existence). Thus, the meaning of an indeterminate VP, as provided by the coercion operation, literally changes depending on whether the context requires a *telic* or *agentive* interpretation. In Pustejovsky's (1995) exposition, contextual constraints are supplied by the agent of the sentence. Thus, if a student is the agent of the sentence, then the *telic* role is extracted during coercion and the sentence is interpreted as *The student started reading the book*. Conversely, if an author

is the agent of the sentence, than the *agentive* role is extracted during coercion and the sentence is interpreted as *The author started writing the book.*¹

In accordance with this view, Traxler et al (2005) have proposed that context is instrumentally involved in the linguistic process, being integrated online while sentence meaning is composed. In contrast, proponents of the pragmatic-inferential view have argued that context is not involved in the linguistic process *per se*, but rather is integrated offline at a higher level of analysis only once a purely denotational representation of the sentence has been gleaned via minimal compositional mechanisms. By this view, context facilitates interpretation by triggering pragmatic-inferences regarding the nature of the indeterminate event (Fodor & Lepore, 1998; de Almeida & Dwivedi, 2008).

Interestingly, while both accounts assign to context a special role during comprehension, early studies of indeterminacy have largely focused on sentences presented in isolation, with only minimal intra-sentential context supplied by the agent of the sentence (e.g., McElree et al., 2001; Pickering et al., 2005). These studies have followed the coercion tradition, for which the agent of a sentence is the primary contextual feature presumed to drive the interpretation of indeterminacy. For the pragmatic view however, inferentially-driven comprehension relies on a much broader range of information, supplied for instance by the discourse or one's prior knowledge. If this view is correct, it remains possible that without sufficient supporting context to guide

¹ Notice that according to Pustejovsky's (1995) theory, the information that allows for the interpretation of the event (e.g., *reading/writing*) performed with the object (e.g., *book*) comes primarily from the features that are constituents of the semantic representation of the nominal.

interpretation, the observed processing costs of indeterminate constructions may reflect natural linguistic violations rather than the coercion mechanism *per se*.²

Thus far, at least two studies (de Almeida, 2004; Traxler et al., 2005) have demonstrated that a broader discourse context reduces the cost of indeterminate sentence processing, suggesting that comprehension may be driven by inferential processes. For instance, de Almeida (2004) embedded indeterminate sentences within passages such as (3a), which provided discourse context designed to facilitate interpretation of subsequent sentences. Participants' reading times were measured for three alternative sentences which concluded the paragraph: indeterminate (3b), preferred control (3c), or non-preferred control (3d). Both the preferred and non-preferred control sentences represented plausible interpretations for the indeterminate sentence, with the former being assigned a higher acceptability rating by participants in a norming task (conducted by McElree et al., 2001).

- (3) a. The secretary would always be sure to work ahead of schedule. She was asked to work on a memo.
- b. The secretary *began* the memo long before it was due.
- c. The secretary *typed* the memo long before it was due.
- d. The secretary *read* the memo long before it was due.

De Almeida found that while readings times of indeterminate sentences (*began the memo*) and non-preferred controls (*read the memo*) were statistically longer than that of preferred controls (*typed the memo*) – specifically in the complement position – indeterminate and non-preferred constructions were not statistically different.

² These studies typically present normative data demonstrating that indeterminate sentences in isolation are judged as natural expressions by participants. However, these normative ratings reflect offline judgements and are insensitive to online mechanisms of sentence processing.

A possible explanation for this result follows from the pragmatic-inferential hypothesis. That is, indeterminate sentences are costly because the reader must integrate information available in the discourse to infer the intended meaning of the sentence. When such information is unavailable, indeterminate expressions take longer to process relative to preferred and non-preferred constructions (McElree et al., 2001; Traxler et al., 2002), both of which explicitly specify their intended meaning. However, when such information becomes accessible in the discourse, the processing of indeterminacy is attenuated to the level of non-preferred constructions, and only remains costly relative to preferred constructions, which follow most naturally from the preceding sentence.

Other researchers (Traxler et al., 2005) have argued, however, that discourse context reduces the costs of indeterminacy by facilitating the coercion operation, rather than by supporting inferential processes. To that end, Traxler et al. (2005) conducted several experiments for which the discourse context was manipulated in one of two ways. In one set of experiments, a biasing context that contained the preferred verb was compared with a neutral context as in (4a) and (4b). In a second set of experiments, a similar biasing context was compared with an indeterminate context as in (5a) and (5b).

- (4) a. *Biased context:* The contractor had been *building in the suburbs*. That spring, he *started a condominium/built a condominium* next to the shopping center.
- b. *Neutral context:* The contractor had been *looking for new jobs*. That spring, he *started a condominium/built a condominium* next to the shopping center.
- (5) a. *Biased context:* The student *read a book* in his dorm room. Before he *started the book /read the book* about the opium trade, he checked his email.

b. *Indeterminate context*: The student *started a book* in his dorm room. Before he *started the book/read the book* about the opium trade, he checked his email.

Traxler et al. (2005) used several eye-tracking measures to analyze the effects of these context manipulations on the processing times of indeterminate sentences relative to preferred sentences that both followed from each context.

Traxler et al. (2005) proposed that if the coercion hypothesis were correct, the cost of indeterminacy should only be reduced when the discourse context includes the indeterminate form as in (5b). Their rationale was that although context helps to disambiguate the intended meaning of indeterminate expressions, it is strictly the task of coercing an entity into an event that is taxing. Thus, even if the discourse contains supporting context as in (4a) and (5a), indeterminate sentences will remain costly, for the coercion operation is still required. The cost of indeterminacy can be reduced only if coercion is obviated altogether, which would be expected if the operation has already been performed in the immediate discourse as in (5b). Although this prediction is *prima facie* at odds with the context effects presented by de Almeida (2004), the authors report data consistent with their predictions. In particular, they report instances where the cost of indeterminacy persists for manipulations in (4) but diminish for the manipulations in (5).

Although such observations are generally in keeping with the coercion hypothesis, Traxler et al.'s (2005) data were rather consistent with the pragmatic account in several ways. Firstly, in their initial experiment involving the manipulations in (4), the authors largely report “marginal” and “trend” effects, whereas comparatively more robust costs are reported in eye-tracking studies for which indeterminate sentences are presented

in isolation (e.g., Traxler et al., 2002). Thus, the biasing context in (4a) appears to attenuate the costs of indeterminacy at least to some extent, despite the contrary predictions of enriched composition.³ Secondly, in their Experiment 2 involving the same manipulation but with moderated materials, Traxler et al. (2005) reported an interaction effect between context and sentence condition, such that indeterminate sentences were costly only when following a neutral context (4b), and not when following a biasing context (4a). Such an observation is consistent with the pragmatic inferential view which attributes the cost of indeterminacy to the demands of inferring the intended meaning of expressions, and is inconsistent with Traxler et al.'s (2005) predictions that coercion effects should persist following the biasing context in (4a).

Finally, in two subsequent experiments which introduced the indeterminate construction in the discourse as in (5b), Traxler et al. (2005) found that, consistent with their predictions, indeterminate sentences were not costly relative to control sentences. However, both the biasing and indeterminate contexts in (5a) and (5b) appeared to support the comprehension process in a quantitatively similar manner. The authors have argued that the cost of indeterminacy diminishes only when the coercion operation is introduced in the context, yet their data show that introducing indeterminate sentences in the context does *not* diminish the cost of indeterminacy relative to a context that

³ In eye-tracking experiments (e.g., Traxler et al., 2002, McElre, Frisson, & Pickering, 2006), indeterminacy effects are typically observed in the noun and post-noun regions of the sentence. When indeterminate sentences are presented in isolation, processing effects at these regions are usually statistically significant, exceeding the conventional .05 alpha level (Traxler et al., 2002, McElre, Frisson, & Pickering, 2006). In Traxler et al.'s (2005) Experiment 1, however, the authors do not consistently observe these effects. Using four eye-tracking outcome measures, the authors report only a single statistically significant cost with a p-value equal to (but not exceeding) .05. The effect was observed in an item analysis, and was the only such effect out of at least eight possible comparisons involving the noun and post noun regions. Otherwise, they report a "trend" effect of indeterminacy in the post noun region, with p-values of .10 in the participant analysis and .07 in the item analysis. Thus, for the majority of analyses involving the noun and post-noun regions, indeterminacy effects did not even achieve "marginal" significance when sentences were presented in context. We take these data to indicate that context substantively attenuates the cost of indeterminacy as suggested in de Almeida (2004).

explicitly describes the intended event. In sum, Traxler et al's (2005) findings do not unequivocally demonstrate that the coercion operation is strictly driving the cost of indeterminacy, and it remains possible that their observed context effects reflect inferential processes during comprehension.

While it is clear that context modulates the cost of semantic indeterminacy, the mechanisms underlying these effects have not been fully fleshed out. The influence of context observed by both de Almeida (2004) and Traxler et al. (2005) has been invoked to support alternative views concerning the resolution of indeterminate sentences. Part of the difficulty stems from the sole reliance on processing-time data to inform the mechanisms of interpretation. A limitation of this approach is that while it can illuminate the conditions under which indeterminate sentences are costly to process, it provides no information regarding the semantic representations that individuals ultimately assign to these sentences. It remains possible, for instance, that distinct context manipulations such as those in (3), (4), and (5) trigger distinct comprehension strategies and, in the process, yield disparate representations for indeterminate sentences, leaving open the possibility that indeterminacy may be resolved in some contexts but not others.

For example, the context in (3) biases interpretation by suggesting that the secretary was working on a memo, without explicitly stating what that work involved. Presumably, such contexts facilitate interpretation by activating the reader's knowledge about what secretaries do when they are asked to work on memos. Conversely, the indeterminate context in (5b) likely does not activate supporting knowledge structures in this manner, and thus, it remains possible that such contexts do not facilitate comprehension whatsoever. Instead, indeterminate contexts such as (5b) may merely

habituate the reader to natural language violations by presenting the same construction twice. It is not surprising that an indeterminate construction would be less costly the second time it is read, but this reduction in cost does not necessarily reflect a change in comprehension. Thus, it becomes increasingly important to investigate the interpretations that individuals assign to indeterminate utterances in order to understand how context influences comprehension. In the present study, we therefore focus on the role of context in modulating the content, rather than the cost, of indeterminate sentences by employing a classic sentence memory paradigm introduced by Sachs (1967).

There is a rich literature on memory for linguistic material demonstrating that false recognition provides insight into the meaning that individuals assign to utterances. In particular, a variety of now classical studies on false recognition for sentences (Fillenbom, 1966; Bransford & Franks, 1971; Bransford, Barclay, & Franks, 1972; Sachs, 1967; Sachs, 1974) have shown that while individuals forget the verbatim form of linguistic expressions, they retain the underlying semantic content or “gist” of the material. This phenomenon is observed during tests of recognition when individuals erroneously recognize expressions that share the same meaning with a presented sentence, despite having distinct surface content. For instance, Fillenbaum (1966) found that participants who memorized sentences such as (6a), were more likely to incorrectly recognize (6b) than (6c) during later testing, indicating that while recognition memory is vulnerable to changes in form, it is resistant to distortions of meaning.

- (6) a. The window is not closed.
 b. The window is open.
 c. The window is not open.

Such errors can provide clues into the interpretations that individuals assign to expressions, for they reflect the underlying semantic “gist” that was initially encoded during sentence comprehension.

Sachs (1967; 1974) demonstrated this phenomenon elegantly for sentences that were presented within passages of continuous discourse. Participants listened to (Sachs, 1967) or read (Sachs, 1974) stories that included a sentence that was tested for recognition at several delay intervals following their initial presentation. During each trial of recognition testing, the participants were either exposed to the original base sentence (7a) or one of several distractors that either represented a fundamental change in meaning (7b) or merely a change in surface structure (7c).

- (7) a. *Base*: The founding fathers considered owning slaves to be immoral.
- b. *Semantically changed*: The founding fathers didn't consider owning slaves to be immoral.
- c. *Formally changed*: Owning slaves was considered to be immoral by the founding fathers.

Sachs (1967; 1974) found that participants were able to distinguish the original sentence from semantically and formally changed distractors immediately after initial presentation. However, as the delay between presentation and testing increased, recognition accuracy deteriorated for formally changed sentences, but was preserved for semantically changed sentences. Sachs' results showed that over time participants begin to falsely recognize a sentence that is synonymous with the base sentence, even though they are able to identify the structural differences between these sentences immediately after initial presentation. Building upon these observations, it becomes possible to establish what individuals

perceive as being the semantic “gist” of an indeterminate sentence such as (1a) by investigating whether they are prone to falsely recognize a fully-determinate distractor sentence such as (1b) during delayed recognition testing.

In order to understand the role of context in the resolution of indeterminacy, we investigated whether a strongly biasing discourse context reduces recognition accuracy for indeterminate sentences. Consistent with the pragmatic-inferential view and the empirical observations from de Almeida (2004), we proposed that context supports interpretation by facilitating inferential processes rather than the coercion operation. Thus, even without explicitly including the event in the discourse, a context which sufficiently activates the hearer’s knowledge about a particular event should support interpretation to the extent that the hearer will be unable to discriminate between the indeterminate sentence they heard and a contextually-biased distractor.

Following Sach’s (1967) procedure, participants listened to strongly biasing passages such as (8a) which included an indeterminate sentence (8b).

- (8) a. *Context:* Ever since Edward published his first novel entitled “The Meek Shall Inherit the Earth”, his agent had been harassing him to produce more journalistic essays. He was juggling three projects at the same time, including a piece for the *The New Yorker*, which was due on Monday. But with his schedule entirely tied up in promoting the book, Edward was forced to dedicate his weekend to the *New Yorker* project. First thing Saturday morning,
- b. *Edward began the article.*

We expected that such contexts would induce false memories for fully-determinate probe sentences that were consistent with the context (9a), but not for fully-determinate

sentences that were inconsistent with the context (9b), despite these latter sentences representing an otherwise plausible interpretation for the indeterminate sentence.

- (9) a. *Semantically-consistent probe*: Edward began *writing* the article.
b. *Semantically-distinct probe*: Edward began *reading* the article.

Following Sach's (1967; 1974) research showing that individuals incur false memories for sentences that share the same semantic "gist" with a presentation sentence, we suggest that false recognition can serve as a marker for how individuals interpret indeterminate sentences. Crucially, the paradigm permits isolating the specific context conditions that elicit false-recognition and hence can illuminate the process by which indeterminate sentences are enriched. In the present study, the discourse was designed to ease pragmatic inferences by activating the listener's knowledge surrounding the target event, without specifying an agent (e.g., author or student) or explicitly stating an event (e.g., writing or reading) purported to facilitate the coercion operation (see Pustejovsky, 1995; and Traxler et al., 2005 respectively). Thus, if participants incur false recognition only for fully-determinate sentences like (9a), to the exclusion of otherwise plausible alternatives like (9b), then contextually-driven comprehension of indeterminate sentences is likely dependent on inferential processes.

Method

Participants

Seventy-two students attending classes at Concordia University were recruited to participate in the study. All participants identified English as their native language, and were compensated with course credit for their participation in a 40 minute experimental procedure.

Materials

The materials consisted of 24 passages of continuous discourse such as (10) that were each comprised of three sentences of biasing context (10a) followed by an indeterminate sentence (10b), which in turn was followed by several sentences of neutral discourse (10c).

- (10) a. *Context*: Lisa had been looking forward to the new Grisham novel ever since it came out. She had finally managed to set aside some time this weekend and made sure to make her home library nice and cozy. First thing Saturday morning, Lisa curled up on the sofa in her library with a blanket and a fresh cup of coffee. With everything in place,
- b. *Lisa began the book*. [Immediate probe point (0s)]
- c. *Neutral discourse*: Suddenly, the doorbell rang. Lisa grunted, put down her coffee and sluggishly made her way to the door. It was her neighbor John and he was out of peanut butter again. Looking through the cupboard, Lisa realized she was no better off. She told John he was out of luck and suggested he try calling Mary, their mutual neighbor.... [Delayed probe point (25s)]

The biasing context included two to four words, such as *Grisham*, *novel*, and *library*, semantically related to the target event without stating the event explicitly or specifying an agent strongly associated with the event. These contexts were designed to trigger inferential processes not specific to Pustejovsky's (1995) formal theory of enriched composition. To ensure that the context was sufficiently biasing, we ran a cloze task which required 18 native English speakers—none of whom participated in the memory experiment—to complete each indeterminate sentence by generating an event that

followed naturally from the context. The indeterminate sentence was presented as the concluding sentence of the paragraph, with a blank space between the verb and the complement NP as in *Lisa began _____ the book*. The majority of these participants generated the biased response for each sentence, with a mean cloze proportion of .77 (SD = .19), indicating that indeed the context strongly biased a particular event.

For each paragraph, three probe sentences were generated for the experimental task. These probe sentences were either identical to the original indeterminate sentence (11a), a formally changed sentence that was semantically consistent with the biasing context (11b), or a formally changed sentence that was semantically inconsistent with the biasing context (11c). The verb for the semantically-consistent probes (11b) represented the response generated by the greatest proportion of participants during the cloze task.

- (11) a. *Identical/Indeterminate*: Lisa began the book.
b. *Semantically-consistent*: Lisa began *reading* the book.
c. *Semantically-inconsistent*: Lisa began *writing* the book.

We designed these probe sentences so that (11a) and (11b) would follow equally naturally from the discourse, but that (11c) would represent a discourse violation despite otherwise representing a plausible interpretation. To ensure our manipulation, we asked a separate group of 50 participants to indicate how naturally each of these sentences followed from the context on a rating scale of 1 to 5, with higher ratings indicating greater discourse continuity. The normative data indicated that the fully-determinate form which was semantically-consistent with the biased context (11b) was considered the most natural in the discourse with mean ratings of 4.52 (SD = 0.36). The indeterminate form in (11a) also received high ratings of discourse continuity (M = 4.43, SD = 0.53) and indeed

the two constructions were not statistically different ($M_D = .09$), $t(23) = .69$, $p = .49$; $d = .20$. As expected, the semantically-inconsistent probes were rated poorly ($M = 2.29$; $SD = .66$) with judgments of discourse continuity deviating markedly from that of both the indeterminate ($M_D = 2.14$), $t(23) = 12.43$, $p < .001$; $d = 3.59$, and semantically-consistent probes ($M_D = 2.23$), $t(23) = 14.50$, $p < .001$; $d = 4.19$.

A set of 24 filler passages, which did not conform to any of the experimental features described above, were also prepared and included in the procedure to mask the characteristics of the target materials. The filler passages were of a similar length to the experimental materials and were written in the same general style, but without including any indeterminate constructions. A full list of our experimental and filler materials is included in Appendix A.

Procedure

Participants were seated in front of an iMac computer running PsyScope X (Cohen, MacWhinney, Flatt, & Provost, 1993), and were provided with a pair of noise-cancelling headphones. Participants were told that they would be listening to short stories through the headset, and that they would be asked to identify whether a particular sentence, which appeared on the screen, was present in the story they had just heard. They were instructed to indicate “Yes” only if the sentence presented on the screen was a verbatim match with a sentence that they had heard earlier. Otherwise, they were to indicate that the sentence was changed by responding “No.” Participants registered their responses on a keyboard by pressing one of two keys marked “Yes” and “No.” We also asked participants to indicate how confident they were that their responses were correct on a seven-point rating scale, with 1 representing a guessed response and 7 representing

total certainty. This variable was later used in the analysis to determine whether false recognition represented a true mnemonic intrusion or whether participant's responses reflected mere guesswork.

Once the examiner explained the procedure, the participants were given three practice trials to become acclimated to the task demands. The experimental session lasted approximately 40 minutes, during which each participant listened to 24 experimental passages and 48 filler passages presented in random order. The filler passages were repeated during the session to yield a 2:1 ratio of filler to experimental items as an added precaution against disclosing the nature of our manipulation.

The indeterminate sentences presented in the discourse were tested for recognition at one of two probe points. The first occurred 0 seconds (s) immediately following presentation of the indeterminate sentence, and the next followed an extended delay of 25s during which the passage continued with several sentences of neutral discourse as in (10c). During immediate and delayed recognition testing, participants were presented with one of three probe sentences such as those in (11), at which point they registered their responses and confidence ratings on the keyboard.

Each passage was roughly 40s long with the two probe periods occurring roughly 15s and 40s following the onset of the trial. The filler items were used to mask these experimental probe points by presenting recognition probes at roughly 5s and 30s following the onset of the trial. We also used the filler items to mask the ratio of "Yes" and "No" responses, in an effort to control for response bias. Two thirds of our experimental recognition sentences (i.e., the semantically-consistent and semantically-inconsistent probes) were novel sentences that were not presented in the passage, and

hence required a negative response. We therefore presented novel probes only a third of the time for the filler items to balance the ratio of required affirmative and negative responses over the course of the session. Because our filler items were presented twice, there was a ratio of 1.25 identical probes for every novel probe.

The experiment consisted of a 3x 2 (probe sentence by probe point) repeated measures design totalling six conditions. Specifically, three probe sentences were presented for each item during the immediate and delayed testing periods. The materials were counterbalanced across six lists, such that the various experimental conditions were distributed equally across items. Each list contained four items representing each of the six experimental conditions. Thus, each participant was exposed to each of the six conditions four times during the experiment, without repetition of items, while only being exposed to a single instance of each item. There were 12 participants per list.

Results & Discussion

We conducted a 3 (probe) by 2 (delay) repeated-measures ANOVA, using participants ($F1$) and items ($F2$) as random factors. The results of our analysis revealed a main effect of delay, such that recognition accuracy for all probe sentences diminished as the interval between presentation and recognition testing increased. In particular, the participants discriminated the probe sentences with 96.2% accuracy immediately following the presentation of the indeterminate sentence in the discourse, but recognition accuracy deteriorated to 63.3% following a delay of 25s, $F_1(2, 142) = 39.57, p < .001$; $F_2(2, 142) = 58.01, p < .001$.⁴ The delay variable accounted for 36% of the unexplained variance in recognition accuracy, yielding a mean difference effect size of 2.24. A

⁴ P-values that exceeded .000 were reported as $p < .001$. Otherwise, the exact p-value is reported.

statistical interaction between delay and probe type was also observed, $F_1(2, 142) = 38.69, p < .001$, $\text{partial-}\eta^2_1 = .35$; $F_2(2, 46) = 40.03, p < .001$, $\text{partial-}\eta^2_2 = .64$, indicating that the impact of the delay interval on recognition accuracy varied as a function of the semantic content of the different probe sentences. We conducted pairwise comparisons of the three probe sentences at both delay periods to evaluate the nature of the interaction.

Given analyses by participants and by items, there were a total of 12 comparisons, which amounted to an experimentwise type-1 error rate of .46 (see Shaffer, 1995; Benjamini & Hochberg, 1995). We therefore adjusted our alpha level for all pairwise contrasts to .004 following the APA guidelines outlined in Kline (2004), in order to bring the family-wise type-1 error rate within conventional limits (i.e., $\alpha = .048$). Contrasts with p-values not exceeding this threshold were not considered statistically significant. Descriptive statistics for all conditions are presented in table 1.

Immediate recognition. Planned comparisons of the three probe sentences in the immediate condition revealed that recognition accuracy for identical/indeterminate probes was not statistically different from that of the semantically-consistent probes ($M_D=0.0006$), $t_1(71) = .02, p = .98$; $t_2(23) = .45, p = .690$; $d = .004$. The inconsistent probes elicited the greatest recognition accuracy relative to both identical/indeterminate probes ($M_D=.05$), $t_1(71) = 2.15, p = .04$; $t_2(23) = 3.19, p = .004$, $d = .36$ and semantically-consistent probes ($M_D=0.05$), $t_1(71) = 2.47, p = .02$; $t_2(23) = 5.27, p < .001$, $d = .41$, but these contrasts were only statistically significant at the adjusted threshold in the analysis by items.

Table 1. *Mean proportion (SD) of correct recognition responses by condition.*

	<i>Immediate (0s)</i>	<i>Delayed (25s)</i>
Identical/indeterminate	0.95 (.22)	0.50 (.50)
Semantically-consistent	0.95 (.23)	0.51 (.50)
Semantically-inconsistent	0.99 (.08)	0.89 (.32)

Delayed recognition. A similar trend emerged following the 25s delay. In particular, recognition accuracy for identical/indeterminate and semantically-consistent probes were statistically indistinguishable ($M_D = -0.02$), $t_1(71) = -.33, p = .74$; $t_2(23) = -.31, p = .76$. Yet, relative to the semantically-inconsistent probes, recognition accuracy following a delay deteriorated markedly for both sentences. On average participants correctly recognized the identical probes on only half of the trials ($M = .50$) compared to a mean proportion of accuracy equalling .89 for the inconsistent probes ($M_D = -.39$), $t_1(71) = -9.61, p < .001$; $t_2(23) = -9.99, p < .001$. The same was observed when comparing inconsistent with consistent probes ($M_D = -.38$), $t_1(71) = -9.62, p < .001$; $t_2(23) = -9.62, p < .001$.

These results indicate that the main effect of delay on recognition (reported above) was moderated by the semantic content of the various sentences. Further effect-size analyses were conducted to elaborate on this interaction. Specifically, we computed standardized effect sizes (Cohen's d) for each probe sentence by subtracting recognition accuracy during the delayed probe period from mean recognition accuracy immediately following presentation of the base sentence. Our results showed that while recognition accuracy for indeterminate and semantically-consistent probes was dramatically impacted by the delay interval ($d=1.87$ and $d=1.88$ respectively), recognition accuracy for semantically-inconsistent probes was relatively preserved ($d=.75$). This differential impact of delay for the various probe sentences is depicted in Figure 1.

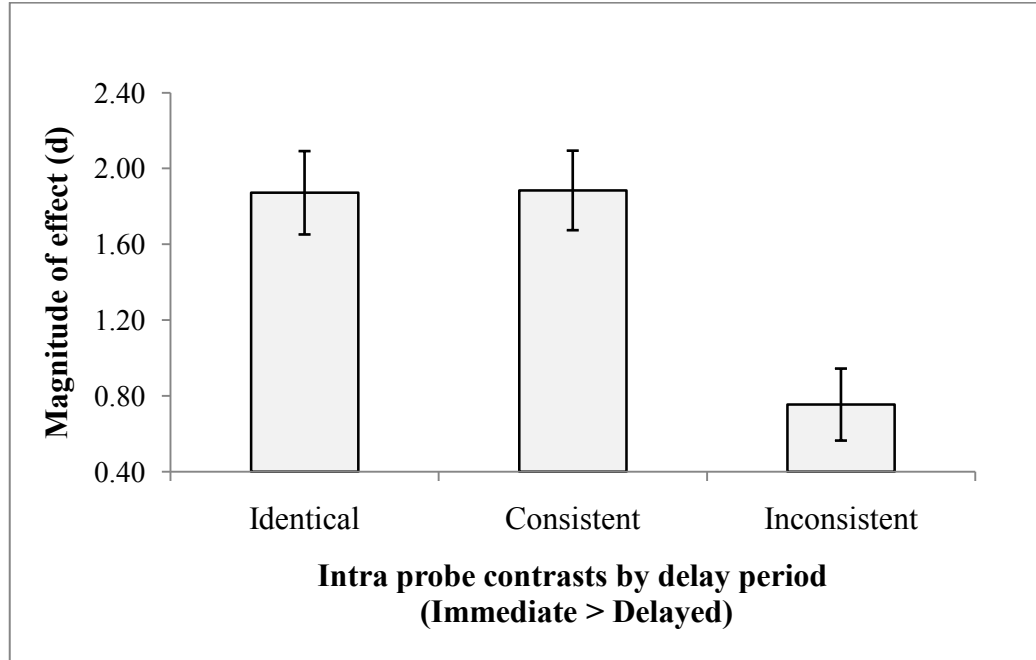


Figure 1: Effect of delay on recognition accuracy. Standardized effect sizes (d) are presented. Each bar represents the standardized difference between immediate and delayed recognition accuracy for each probe sentence. Error bars represent estimated 95% confidence intervals for effect sizes (see Kline, 2004).

Confidence Ratings

The above interaction demonstrates that recognition accuracy for identical/indeterminate and semantically-consistent probes diminishes over time, and that it remains relatively intact for semantically-inconsistent probes. We conducted further analyses on participants' confidence ratings in order to evaluate the nature of their responses. In particular, we expected that correct and incorrect responses would reflect diverging phenomena across the various probe sentences. The main goal of the analysis was to determine whether false recognition of semantically-consistent probes indeed reflected mnemonic intrusions as opposed to mere guesswork. For the sake of this analysis, we focused exclusively on delayed recognition. Mean confidence ratings for correct and incorrect responses are presented in table 2.⁵ These data were converted into percentages for ease of exposition.

⁵ The proportion of correct and incorrect responses varied across conditions, leaving several cells empty in the dataset. For instance, only 11% of delayed responses for semantically-inconsistent probes were incorrect. For a subset of the inconsistent items, no participants responded incorrectly, and thus no confidence ratings were registered for that item under the incorrect condition. For the sake the analysis, we imputed these empty cells with the mean values of the relevant condition.

Table 2. *Mean (SD) level of expressed confidence for correct and incorrect responses by condition.*

	<i>Correct responses</i>	<i>Incorrect responses</i>
Immediate (0s)		
Identical/indeterminate	99.48 (18.72)	88.57 (159.07)
Semantically-consistent	98.86 (47.61)	86.61 (152.62)
Semantically-inconsistent	99.36 (39.27)	64.29 (70.71)
Delayed (25s)		
Identical/indeterminate	72.42 (149.43)	67.12 (174.34)
Semantically-consistent	70.09 (174.89)	71.23 (146.39)
Semantically-inconsistent	82.50 (173.87)	63.20 (182.05)

We conducted a 2 (response: correct versus incorrect) by 3 (probe sentence) repeated-measures ANOVA. The analysis revealed a main effect of the response factor, such that participants expressed statistically greater confidence in their correct responses than in their incorrect responses ($M_D = 7.98$), $F_1(1,71) = 18.70$, $p < .001$; $F_2(1,23) = 17.93$, $p < .001$. Indeed the response factor explained 21% of the residual variance in confidence ratings in the analysis by participants (and 44% in the analysis by items), and yielded a mean difference effect size of .40. The analysis also revealed an interaction effect, such that the difference in confidence ratings between correct and incorrect responses was moderated as a function of the semantic content of the probe sentences, $F_1(2,142) = 15.50$, $p < .001$; partial- $\eta^2_1 = .18$; $F_2(2,46) = 10.43$, $p < .001$; partial- $\eta^2_2 = .31$. We conducted planned comparisons of the various probe sentences for both correct and incorrect responses to further evaluate the nature of this interaction. Yet again, the analysis involved 12 pairwise contrasts yielding a family-wise type-1 error rate of .46 and thus the adjusted threshold of statistical significance was .004.

When participants responded correctly, their confidence ratings for identical and consistent probes did not statistically differ ($M_D=1.82$), $t_1(71) = 1.89$, $p = .063$; $t_2(23) = .578$, $p = .569$. However, they reported statistically greater confidence in correct responses for inconsistent probes than for identical probes ($M_D= 9.89$), $t_1(71) = 2.74$, $p = .008$; $t_2(23) = 4.09$, $p < .001$ and consistent probes ($M_D= 11.73$), $t_1(71) = 4.76$, $p < .001$; $t_2(23) = 3.78$, $p = .001$.

None of the comparisons for incorrect responses achieved statistical significance (all p 's $> .05$). Yet, analysis of effect sizes suggested that confidence ratings for the various sentences reflected substantively diverging phenomena. In particular, for each

response value (i.e., correct and incorrect) we calculated mean difference effect sizes for the following directional comparisons: (1) identical > consistent, (2) identical > inconsistent; and (3) consistent > inconsistent. The results of our analyses (depicted in Figure 2) revealed fluctuations in the magnitude of effects across comparisons as well as shifts in the direction of these effects.

More specifically, for the first directional comparison (identical > consistent), participants reported marginally greater confidence ($d = .17$) for identical probes than for consistent probes when responses were correct. However, when responses were incorrect, the opposite was observed with participants reporting greater confidence for consistent probes over identical probes ($d = -.40$). Interestingly, the direction of these effects was inverted for the second directional comparison (identical > inconsistent), indicating that relative to identical probes participants expressed diverging levels of confidence for consistent and inconsistent sentences, both when responses were correct and incorrect. In particular, participants reported greater confidence for correct responses in the inconsistent than in the identical condition ($d = -.92$), but greater confidence for incorrect responses in the identical condition ($d = .44$). In the final directional comparison (consistent > inconsistent), the same pattern was observed but to a greater extent. That is, participants showed greater confidence for inconsistent probes when responses were correct ($d = -1.13$), but greater confidence for consistent probes when responses were incorrect ($d = .59$).

This analysis reveals several important trends. Firstly, participants reported the highest degree of confidence when responding correctly to inconsistent probes relative to both other sentence types. This suggests that discourse violations generated a pop-out

effect, making it easy for participants to reject these sentences. Conversely, across comparisons involving the consistent probes, participants reported the highest degree of confidence when their responses were incorrect and the lowest degree of confidence when their responses were correct. This complementary effect indicates that participants were not only more prone to falsely recognize the contextually-biased sentences, but also had the most pronounced difficulty rejecting them. We take this pattern to suggest that false-recognition of semantically-consistent probes reflected true mnemonic intrusions, rather than chance variation.

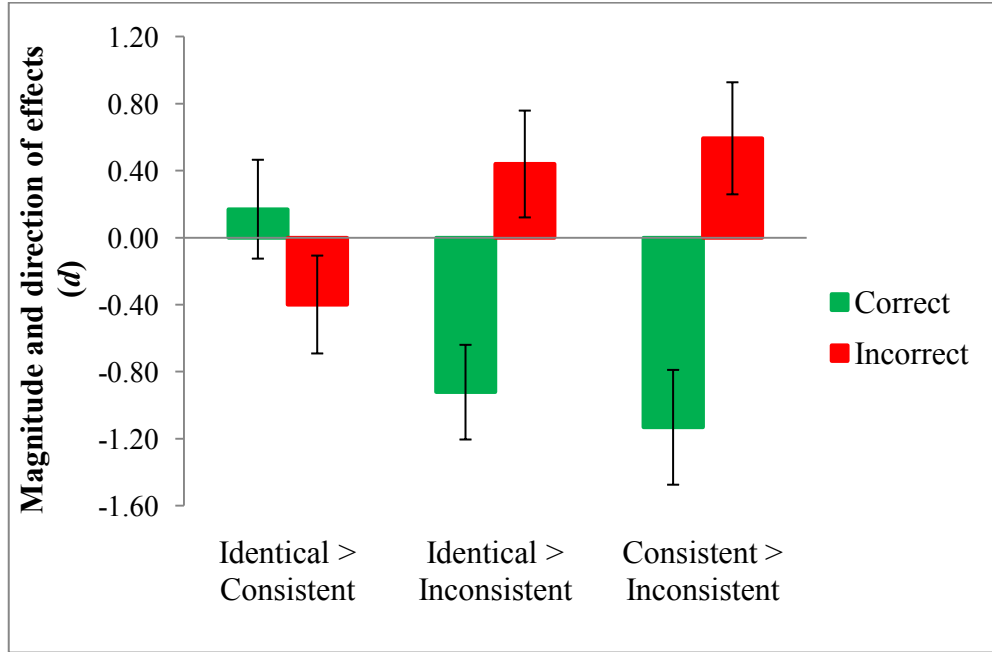


Figure 2: Directional effects for expressed confidence by response type. Presented are standardized effects sizes (d) for correct and incorrect responses during delayed recognition. Error bars represent estimated 95% confidence intervals for effect sizes (Kline, 2004).

Our analyses clearly show that participants are able to differentiate target sentences from distractors immediately following the presentation of the critical sentence in the discourse. In particular, participants responded correctly on at least 95% of trials for all probe types. Although statistical analyses by items revealed differences in recognition accuracy between the various sentences, these are not considered substantively significant, as the few observed recognition errors during immediate testing likely reflected lapses of attention. The relatively greater accuracy observed for inconsistent probes likely indicates that discourse violations elicit a pop-out effect. More importantly, during delayed recognition, participants incurred false-recognition for fully-determinate distractors that were contextually biased compared to unbiased alternatives. Intriguingly, participants reported a high degree of confidence (71%) that their responses were correct when they were committing such errors

Consistent with observations from Sachs (1967; 1974), such false recognition is a marker for how participants perceived the semantic content of a presentation sentence. Thus, our results appear to indicate that an indeterminate sentence such as *Lisa began the book* presented within a strongly biasing discourse tends to be interpreted as a fully-determinate sentence such as *Lisa began reading the book*. Because participants incurred false memories for the biased interpretation and not for an otherwise plausible alternative, our results suggest that participants reconstruct indeterminate sentences in a manner that is fully-dependent on the discourse context. Crucially, our contexts were designed to activate knowledge related to the biased event without including any factors which have been purported to facilitate the coercion operation – i.e., explicitly stating an event such as reading or writing (Traxler et al., 2005) or specifying an agent (e.g., author or student)

strongly associated with the indeterminate event (Pustejovsky, 1995; Lapata et al., 1993). Consequently, our results appear to suggest that context facilitates the resolution of indeterminacy by triggering inferential-processes.

Covariate Analyses

A lingering question for exposition concerns whether or not these data truly discriminate between the pragmatic-inferential and coercion accounts of indeterminate sentence enrichment. Although we have shown that inferential processes are instrumental for generating fully-determinate intrusions of indeterminate sentences, the possibility remains that some form of coercion is at play. That is, demonstrating the role of inferential processes during comprehension does not independently rule out the possibility that enrichment requires semantically converting the nominal entity into an event. We therefore conducted additional covariate analyses with our normative data, focusing on two potential alternative interpretations of our results from the enriched composition framework.

The first alternative interpretation concerns the notion that the coercion mechanism proffers readers/hearers with an enriched interpretation by default (e.g., Pustejovsky, 1995), with or without a supporting discourse context; and the second concerns the possibility that enrichment-via-coercion is context dependent, occurring in concert with inferential processes and not in spite of them (e.g., Traxler et al., 2005). These views represent variations of the coercion hypothesis, with varying degrees of commitment concerning the role of a discourse context. Presumably, proponents of both accounts might suggest that the observed false recognition for contextually-biased distractors is the outcome of the coercion operation, whether it occurs by default or as a

function of the discourse context. In order to rule out these explanations, we computed two indexes based on our normative data – i.e., the first representing default enrichment and the other representing context-driven coercion – and correlated each index with the proportions of false recognition for contextually-biased distractors. We predicted that neither index of coercion would be statistically associated with the intrusion rate in keeping with the view that these sentences are enriched pragmatically, without semantically converting the NP entity into an event.

Default enrichment. The cloze task can be used as a metric for default coercion, with higher cloze proportions representing the degree to which enrichment might occur automatically. For instance, a sentence such as *The student began _____ the book* may yield high cloze values for there are only few plausible interpretations for the indeterminate event (e.g., *reading* or *writing*). Such a sentence may be said to be automatically enriched. In contrast, a sentence such as *The waitress started _____ the coffee*, which may be completed by many plausible events (e.g., *servicing, pouring, brewing, drinking*, etc.) likely yields comparatively lower cloze values, and thus may be less likely to be enriched by default. In this sense, such cloze values track the automaticity of enrichment, and would serve as a metric for default coercion if such a view were indeed correct.

Another normative variable that tends to reflect the “defaultness” of enrichment is acceptability judgements, for presumably sentences which are taken to be automatically enriched via coercion would be rated more acceptable by participants than sentences which are not. In fact, the observation that indeterminate sentences are typically judged as sensible linguistic expressions (e.g., McElree et al, 2001) often serves as the very

premise for postulating the coercion operation (e.g., Pustejovsky, 1995; Jackendoff, 1997). By this view then, acceptability ratings for indeterminate sentences presented in isolation should vary with the occurrence of default enrichment – i.e., indeterminate sentences which yield high acceptability ratings may be said to be enriched by default via the coercion mechanism, whereas sentences which yield low acceptability ratings might be considered to be less amenable to default enrichment. Thus, such ratings should be correlated with the false-recognition rate, if indeed enrichment occurred as a function of coercion. Conversely, if enrichment occurred as function of pragmatic inferential processes triggered by the biasing discourse *sans* coercion, then both variables (i.e., cloze probabilities and acceptability ratings for indeterminate sentences presented in isolation) should have no bearing on the rate of false recognition.

During the initial stages of material development, we collected normative data for both tasks with indeterminate sentences presented in isolation. A group of 18 native English speakers participated in the cloze task and a separate group of 15 individuals participated in the rating task. These tasks were conducted with 19 of the 24 indeterminate sentences that were later used in our experiment. The remaining sentences were excluded from the present analysis. For each item, we computed a composite index representing default coercion by calculating the product of these two normative variables (i.e., cloze proportions multiplied by acceptability ratings). For example, the sentence *Lisa began the book* received a cloze value of .92 (with *reading* being the dominant response) and a mean acceptability rating of 3.9, yielding a value of 3.59 (i.e., $.92 \times 3.9 = 3.59$) on the composite index. In contrast, the sentence *Pam continued the sandwich*

received a cloze value of .92 (with *eating* as the dominant response) and a mean acceptability rating of 2.1, yielding a score of 1.93 on the composite index.

For a subset of our items, the biasing contexts conflicted with the dominant responses obtained during the cloze task. These items were assigned a value of zero on the default index, for by necessity false recognition of semantically-consistent probes that conflict with the preferred interpretation cannot reflect default coercion. Finally, we conducted a bivariate correlation between the default index and the false recognition values for semantically-consistent distractors at the delayed probe point. The results of our analysis showed that the two variables were not statistically correlated ($r = .22$, $p = .38$), with the default index accounting for only 4.8% of the total variation in recognition accuracy. This analysis, therefore, casts doubt on the possibility that a default mechanism of enriched composition could explain our findings.

Contextually-driven coercion of nominals into events. A major impetus for the development of the coercion theory is the observation that certain indeterminate VP's emerge more often in corpus analyses than their fully-determinate counterparts (Briscoe, Copestake, & Boguraev, 1990; Lapata, & Lascarides, 2003). Proponents of enriched composition have suggested that such observations provide evidence that indeterminate constructions are considered more natural in everyday discourse than fully-determinate sentences, likely because they are interpreted via a systematic processing mechanism such as coercion (Frisson & McElree, 2008). The same rationale might extend to indeterminate sentences embedded within a biasing context (as is the case with the present materials), which are judged to be more natural than their fully-determinate

counterparts. Specifically, such preferences might be taken as evidence for the coercion mechanism operating in concert with inferential processes.

For a subset of our items ($N=10$, 42%) participants expressed a preference for indeterminate over semantically-consistent sentences, by assigning them higher ratings of discourse continuity during the norming task described in the Method section. The degree to which such preferences were expressed should capture, according to this view, the degree to which entity-event coercion may have occurred as a function of a biasing context. The index we used to track such preferences was calculated as the arithmetical difference between discourse continuity ratings for indeterminate and semantically-consistent probes. For instance, participants assigned to the indeterminate sentence *Sebastian finished the portrait* a mean discourse continuity rating of 5, whereas they assigned to the semantically-consistent alternative *Sebastian finished painting the portrait* a mean rating of 4.3, expressing a preference of .07 for the indeterminate form. In order to evaluate the potential claim that coercion drives the interpretation of indeterminate sentences in context, we conducted a bivariate correlation with this index and the proportion of false-recognition for semantically-consistent probes.

We found that the two variables were not statistically correlated ($r = .13$, $p = .54$), with the indeterminate preferences accounting for only 2% of the total variation in false recognition of semantically-consistent foils. Thus, our results cannot be explained with reference to a context-sensitive version of the coercion hypothesis but rather suggest that inferential processes *sans* coercion drive the resolution of indeterminate expressions in context.

General Discussion

In the present study, we investigated whether a strongly biasing context facilitated the interpretation of indeterminate sentences. We employed a discourse-based sentence recognition paradigm introduced by Sachs (1967) to determine how individuals interpret indeterminate sentences in natural discourse, particularly when the context provides clues as to what might be the intended meaning of such expressions. A central motivation of the study was to investigate whether context supports interpretation by triggering inferential processes *sans* coercion or whether coercion is instrumentally involved in the process of indeterminate sentence comprehension. In order to address this issue, three empirical questions were formulated: (1) would participants demonstrate poorer recognition accuracy for semantically-consistent probe sentences than for semantically-inconsistent probe sentences? (2) Would such false recognition of semantically-consistent foils reflect the interpretations that individuals assigned to the indeterminate sentence in context? And (3), which theory of indeterminate sentence processing (pragmatic-inferential versus enriched composition) would be better suited to explain our findings?

Our results showed that immediately following the presentation of indeterminate sentences in context, participants were able to indicate whether or not one of three probes sentences were presented in the discourse with at least 95% accuracy. However, following a delay of 25s, participants showed poor recognition accuracy (i.e., 50%) for the indeterminate and semantically-consistent sentences, but relatively preserved recognition accuracy for semantically-inconsistent sentences (i.e., 89%). At a minimum, these results indicate that once a verbatim representation of the indeterminate sentence

was lost, participants were unable to discriminate the indeterminate and semantically-consistent foils, but were proficient at rejecting the semantically-inconsistent foils.

A plausible interpretation for this result is that the semantically-consistent probes represented the interpretation that participants assigned to the indeterminate sentences in context. Such an interpretation is in keeping with the literature on false-recognition (e.g., Fillenbaum, 1966; Sachs, 1967; 1974) demonstrating that, following verbatim loss, sentences are reconstructed in a manner consistent with their perceived meaning. If this principle generalizes to our observations, then our data suggest that provided with a sufficiently biasing context, participants enrich indeterminate sentences during comprehension. Analyses of participants' expressed confidence in their responses indicated that during trials of false recognition, participants were inclined towards mnemonic intrusions for the semantically-consistent probes reporting a high degree of confidence (i.e., 71%) in their erroneous responses. We believe that both the rates of false recognition and the degree of expressed confidence in these errors indicate that some form of enrichment occurred between presentation and recognition testing.

The central question of our study, however, was whether such enrichment occurred via inferential processes consistent with the pragmatic view (e.g., de Almeida, 2004; de Almeida & Dwivedi, 2008), or whether it occurred as a function of the coercion operation consistent with the enriched composition account (e.g., Pustejovsky, 1995; Jackendoff, 1997). We sought to inform this issue both through experimental design and statistical covariate procedures. With regards to the former, we designed our materials specifically to trigger inferential processes without including any contextual features that have been purported to facilitate the coercion operation. One such feature proposed to be

involved in the coercion operation is the agent of indeterminate sentences, specifically when expressed in terms of a particular occupational role such as *author* or *student*. According to formal accounts of enriched composition, such contextual information is instrumental for selecting the appropriate interpretation for the indeterminate event (Lapata, Keller, & Scheepers, 2003). Thus, instead of specifying an agent such as *author*, *student*, or *baker*, etc., the subjects of our indeterminate sentences were referred to by their assigned names such as *Lisa*, *Claire*, and *Alan*. Information regarding the subjects' agentive roles had to be inferred from the content of the passage, and was never overtly described.

A second feature purported to facilitate the coercion operation in context is prior exposure to the indeterminate VP or, at the very least, some explicit reference in the discourse to the event left underspecified in the indeterminate sentence (Traxler et al., 2005). Again, neither the indeterminate form nor the biased event were included in our discourse contexts, and therefore, information regarding the intended meaning of the indeterminate sentence had to be inferred from clues provided by the discourse.

Although it is clear that inferential processes were essential for incurring the false memories observed in our study, we cannot conclusively discriminate between the pragmatic-inferential and coercion views on the basis of the recognition and confidence data alone. That is, it remains possible that comprehension of indeterminate sentences requires the coercion operation whether or not such expressions are embedded within a discourse that elicits pragmatic inferences. In order to further distinguish between the pragmatic-inferential and coercion accounts of indeterminate sentence processing, we relied on covariate analyses involving two separate indexes of coercion—one based on

cloze proportions multiplied by acceptability ratings, and another based on the difference in discourse continuity ratings between indeterminate and semantically-consistent sentences. The results of these analyses revealed that neither index was statistically correlated with the false recognition rate of contextually-biased sentences, suggesting that contextually-driven enrichment was achieved via inferential processes independent of the coercion operation.

Thus far, the psycholinguistic literature on indeterminate sentence comprehension has focused exclusively on online processing measures, typically showing that these sentences are costly to process when presented in isolation (McElree et al., 2001, Traxler et al., 2002), but that a sufficiently supportive discourse attenuates these costs (de Almeida, 2004; Traxler et al., 2005). We have suggested that these data have been invoked to support two alternative theories of indeterminate sentence processing, one which attributes enrichment to lexically-driven semantic operations (i.e., coercion) and another which attributes enrichment to pragmatically-driven inferential processes. A major contribution of the present investigation is that we focused on the content rather than the cost of comprehension, permitting us to elaborate on the semantic representations that individuals ultimately assign to indeterminate sentences. We believe that such data are essential for determining the precise contextual conditions that trigger the enrichment of indeterminacy. We have demonstrated here firstly that inferential processes are instrumental for contextually-driven enrichment and secondly that pragmatic enrichment occurs even when coercion is experimentally and statistically controlled.

At stake in this debate is our very conception of how sentence meaning is composed by the linguistic system – i.e., as to whether it outputs semantically shallow representations that are later enriched by pragmatic processes (de Almeida & Dwivedi, 2008; de Almeida & Riven, submitted) or whether the linguistic system *per se* enriches sentences via lexical-semantic operations such as coercion (Pustejovsky, 1995; Jackendoff, 1997). The data from the present experiment preferentially support the former view and converge well with evidence obtained from a recent neurolinguistic experiment using functional magnetic resonance imaging (fMRI) (de Almeida et al., submitted).

Specifically, de Almeida and colleagues showed that indeterminate sentences activate a wide range of brain regions involved in syntax (i.e., Broca's area), executive functions (i.e., anterior cingulate cortex), and pragmatic processes (i.e., right frontal and temporal regions), demonstrating that both linguistic and pragmatic neural resources figure prominently in indeterminate sentence comprehension. The present study complements these findings by demonstrating that pragmatic resources are involved in the enrichment process *per se*, and that inferences emerge over time – i.e., only following the verbatim loss of linguistic structure. Taken together these results provide converging evidence for the pragmatic-inferential hypothesis, suggesting that following an initial structural analysis of indeterminate sentences, the linguistic system outputs semantically shallow representations that trigger enrichment via non-linguistic inferential resources.

Going forward it will become increasingly important to demonstrate that pragmatic enrichment is optional – i.e., that it does not occur by default but rather as a function of general knowledge. Presently, we have shown that indeterminate sentences

are enriched via pragmatic inferences when embedded in a discourse that provides clues as to the intended meaning of the event, but we have not demonstrated that these sentences would otherwise remain indeterminate. In order to provide additional support for the pragmatic-inferential view, it is necessary to demonstrate that, in the absence of a biasing context, such sentences are not necessarily enriched.

It is noteworthy that the results of the present experiment were quantitatively more pronounced than Sachs's (1967) initial findings, yielding both comparatively better discrimination during immediate testing and poorer discrimination during delayed testing. One reason for the former may have been the relative propositional simplicity of our presentation sentences, which likely taxed working memory resources to a lesser degree than Sachs's (1967) propositionally dense sentences (see example (7a) above). But this cannot explain the comparatively poorer discrimination for our sentences observed during delayed recognition. A likely explanation for this difference, rather, was the discourse context itself, which was distinguished from that of Sachs' (1967; 1974) in that it generated inferences with regards to the intended meaning of the test sentence. Given the novel nature of our materials as applied to Sachs' (1967) paradigm, the present study yields intriguing implications for our understanding of discourse processing that extend beyond models of indeterminate sentence comprehension.

Heretofore, the bulk of the literature on false memories for sentences has focused on synonymous expressions (e.g., Fillenbaum, 1966; Sachs, 1967; 1974), with only a subset of this literature emphasizing inferential processes (e.g., Barclay & Franks, 1971; Jahn, 2004). A celebrated illustration of the latter is provided by Bransford et al. (1972) who showed that false recognition can occur as a function of spatial models constructed

from, but not expressed in, the linguistic material. In their classic experiment, participants tended to get tripped up on a foil sentence that described a fish swimming beneath a log. This occurred only when they studied sentences such as (12a) but not when they studied sentences such as (12b).

- (12) a. Three turtles rested *on* a floating log and a fish swam beneath them.
b. Three turtles rested *beside* a floating log and a fish swam beneath them.

Notice that the prepositions distinguishing these sentences (i.e., *on* versus *beside*) suggest different spatial relations between the fish, the turtles and the log with only (12a) permitting the inference that the fish swam beneath the log.

These results have been replicated not only for spatial (e.g., Jahn, 2004) but also for temporal relations (e.g., Rinck, Hannel, & Becker, 2001), with false recognition reflecting a logical inference based on the relevant situation model. The present study is similar to these in the sense that false recognition was demonstrated for sentences that were not synonymous with the target sentence (contra Sachs, 1967; 1974), but is unique in the sense that mnemonic intrusions reflected abductive rather than deductive inferences. Our recognition foils included semantic material that was neither articulated in the target sentence, nor logically entailed by the discourse, and consequently, recognition thereof indicated that participants' comprehension of the text reflected elaborative inferences from the expressed discourse.

In conclusion, we have shown that when individuals initially process an indeterminate sentence, they are aptly able to distinguish the expressed content – *Lisa began the book* – from an enriched interpretation – *Lisa began reading the book*. But as time elapses, the enriched interpretation intrudes and individuals rely on inferences

drawn from the discourse context to reconstruct these sentences. Thus, pragmatics figures prominently in the enrichment of indeterminate sentences and appears to follow from an initially shallow semantic representation of the material consistent with the pragmatic-inferential account of indeterminate sentence processing.

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Appendix A: Stimulus Set

Experimental Items (24)

Item 1

Lisa had been looking forward to the new Grisham novel ever since it came out. She had finally managed to set aside some time this weekend and made sure to make her home library nice and cozy. First thing Saturday morning, Lisa curled up on the sofa in her library with a blanket and a fresh cup of coffee. With everything in place, *Lisa began the book*. [Immediate probe point]

Suddenly, the doorbell rang. Lisa grunted, put down her coffee and sluggishly made her way to the door. It was her neighbour John and he was out of peanut butter again. Looking through the cupboard, Lisa realized she was no better off. She told John he was out of luck and suggested he try calling Marie, their mutual neighbour. Lisa realized that this was a futile suggestion, but she was eager to get rid of him. John told her not to worry about it as he turned to descend the front stairs. "See you later" Lisa called out as she closed the door. "Yep" John replied, evidently dejected. [Delayed probe point]

Probe sentences: *Lisa began/ began reading/ began writing* the book.

Item 2

Dan was so busy with clients all day that he skipped lunch without even noticing. Now that his work was finally over, Dan was feeling hungry as he made his way home. When he arrived at the house, he dropped his things in the entrance, dashed for the kitchen, and scavenged the fridge for yesterday's leftovers. Finally in front of the TV, *Dan started supper*. [Immediate probe point]

He flipped through the channels and was glad to discover a documentary on the American civil war. Dan had always been interested in U.S. history and he considered the civil war to be among the country's most dramatic tales. He had seen this particular documentary before and was impressed with the level of detail with which the story was told. He tried to remember the other documentaries that had been made by the same journalist. He made a mental note to look it up later. [Delayed probe point]

Probe sentences: *Dan started/ started eating/ started ordering* supper.

Item 3

Claire had fallen behind this semester and was worried that she would not have time to work on her final project before the deadline. After all, a 15-page review of the history of the mind-body problem was an exhausting task. Fortunately, she had completed all of her research and had even drafted a detailed outline and introduction. Working diligently all night, *Claire finished the paper*. [Immediate probe point]

When she awoke the next morning there was a message on her phone from her boss. A co-worker called in sick and they needed a replacement for the night shift. Claire knew she could use the money so she decided to put off her other plans for the night. She called her boss to say she would be glad to cover the night shift. Her boss told her she appreciated the offer, but one of her coworkers called just before she did. Claire said she didn't mind, but would like to increase her work hours if possible. [Delayed probe point]

Probe sentences: Clare *finished/ finished writing/ finished recycling* the paper.

Item 4

Ever since Edward published his first novel entitled *The Meek Shall Inherit the Earth*, his agent had been harassing him to produce more journalistic essays. He was juggling three projects at the same time, including a piece for the *The New Yorker*, which was due on Monday. But with his schedule entirely tied up in promoting the book, Edward was forced to dedicate his weekend to the *New Yorker* project. First thing Saturday morning, *Edward began the article*. [Immediate probe point]

The radio announcer in the background summarized the day's stories in his dry yet chipper tone. One in particular caught Edward's ear. The New York Public Zoo had a break in the night before, and several animals were missing. Police initially suspected this was simple vandalism but further investigation revealed several smaller animals were missing. The story was still developing but strange reports coming from Central Park seemed to indicate that the critters had been released instead of stolen. [Delayed probe point]

Probe sentences: Edward *began/ began writing/ began reading* the article.

Item 5

Amy wanted to truly satisfy Ted's belly this Valentine's Day. After all, "the way to a man's heart is through his stomach," and if done right, a homemade meal can be very romantic. Amy knew that Ted loved poultry, especially when served with a festive flair like Thanksgiving and Christmas dinners. Placing all the ingredients in the oven, *Amy started the turkey*. [Immediate probe point]

It was only 3 months ago that the two nearly split up. Ted was in the midst of brokering a new deal and he was spending long hours at work. Amy too had an increased workload because Ted was rarely home to help out with the children. They were both terribly stressed and would often butt heads when Ted finally did come home from work. To avoid the inevitable confrontations with Amy, Ted began frequenting McGovern's Pub after work while Amy was left at home rearing the two boys. Late one evening, after Ted had still not returned from the pub, Amy decided that she had enough. She drafted a long note explaining what she was going through and that she was not willing to stay in the relationship any longer if things continued this way. She left the note on Ted's pillow and went to bed. That turned out to be the move that saved their marriage. [Delayed probe point]

Probe sentences: Amy *started/ started cooking/ started eating* the turkey.

Item 6

Alison was really excited about her Canadian Idol audition. She would be performing "Amazing Grace" because she felt that the melody complimented her voice really well. When she was finally called in to the audition room, Alison entered the room, carefully approached her marker and introduced herself. Feeling the butterflies in the pit of her stomach, *Alison started the song*. [Immediate probe point]

She kept an image of her mother in her mind. Her mother had been the most supportive person she knew. The past year had been particularly difficult, and her mother made sure to call her every week to check up on her. Alison had just moved to a new city to pursue her degree and was adjusting much slower than she had anticipated. Her mother kept her up to date on all the nieces and nephews to give her a feel of home. Alison found a job right away but was finding it a particularly demanding position and was having trouble balancing work and school. Her mother told her to sort out her priorities and find a different job if she had to. [Delayed probe point]

Probe sentences: Alison *started/started singing/ started playing* the song.

Item 7

Irene was in for a twenty-six-mile marathon today and she was well prepared. She had gradually increased her endurance on the treadmill over the past year and was now able to go for six hours uninterrupted. On the day of the race, Irene got off to a strong start conquering the first fifteen miles in just over two hours. And in only 4 hours, *Irene completed the track*. [Immediate probe point]

The celebrations that followed were momentous. All her family and friends had gotten together to throw her a surprise party at her place, and they thought it would be grand to invite everyone she knew. It had been a long while since she had been out with her friends, what with her jammed-packed schedule. Irene was one of those people who handled stress effortlessly and could not tolerate boredom. She was always most comfortable in the thick of things, and her choice of work reflected that admirably. [Delayed probe point]

Probe sentences: Irene *completed/ completed running/ completed paving* the track.

Item 8

Carlos had fallen behind in his research this semester due to the heavy course-load. He was teaching three classes for the first time in his academic career and was feeling the pressure of the job. He had just returned the midterm exams to all of his students, and he regretted promising them that he would return the papers so soon. Clearing his schedule for the weekend, *Carlos finished the assignments*. [Immediate probe point]

Late Sunday evening, he noticed a message on his phone. It was the department secretary and she said it was rather urgent. He called her back immediately to determine what the issue was. Carlos encountered problems with the secretary before and had a very low tolerance for bureaucratic mishaps. She told him that the organizing committee for a new field conference had contacted the university hoping to reach him. Carlos was torn between excitement and dread. This conference was a fantastic opportunity for his research agenda, but he couldn't imagine how he could possibly take on the added responsibility. He rubbed his eyes and shook his head. At least this was one of those good problems. [Delayed probe point]

Probe sentences: Carlos *finished/ finished grading/ finished writing* the assignments.

Item 9

Every Wednesday, Tamara entertained her kindergarten students by recounting a classic Disney adventure in her own words. She was midway through *Beauty and the Beast* when a bluebird flew into the classroom. A rare sight in an urban neighbourhood, the children's interest in the tale suddenly transferred to the present fascination. As soon as the children's curiosity wore off, *Tamara continued the story*. [Immediate probe point]

Just then the principle's voice came on the loud speaker. She was announcing a routine fire drill that would take place in the next class period. The children started to buzz with excited chatter. To them, a fire drill was practically an extra recess. It was not class, and it was not indoors, and that was good enough. Tamara was a little annoyed at the number of interruptions today but decided that a nice break of sunshine was just what she could use at the moment. As the class period stretched on, the children were braced with anticipation. [Delayed probe point]

Probe sentences: Tamara *continued/ continued telling/ continued writing* the story.

Item 10

The bakery was a mess and Judy still had many pastries to make for the next day, not to mention the usual selection of bread for the retail counter. At the top of her list was an order for Camden Elementary, the school her daughter attended. It was Katie's birthday and Judy planned to sneak a birthday surprise into the school's usual bread order. Finally at 11:00pm, *Judy finished the cake*. [Immediate probe point]

At last, she could begin cleaning. It would be 2 in the morning before she would arrive home and Judy was dreading the inevitable fight with Tom that would follow the next day. Tom was emasculated enough that Judy was the sole breadwinner of their family. It only exaggerated Tom's sense of insecurity when Judy came home late after a night of hard work. He would often get suspicious and make wild accusations about Judy's fidelity. Judy always understood that these outbursts were never really about her loyalty as a lover. The thought scared her, because it was apparent that her life's passion – her work – would always be conceived as a sort of betrayal. Eventually, Tom's sense of masculinity would cost her something grave – her autonomy or her family. [Delayed probe point]

Probe sentences: Judy *finished/ finished baking/ finished eating* the cake.

Item 11

Damian Biggs is the front man for the 3 piece punk band Road Rage. Since the early 90's, the band has been the darlings of the local punk scene as droves of angst-ridden teenagers swarmed the stage at The Dungeon to see Damian and co take on "The Man." Surprisingly, the band has aged well, headlining a sold out concert last night at The Arena. The 20,000 spectators stood in silent anticipation as *Damian started the guitar*. [Immediate probe point]

This was the first appearance for Road Rage in just over a decade. Damian wondered why they had not got the gang back together sooner, though the drummer Mitch was not feeling quite as reminiscent as Damian. The two had been friends since the days of skipping out on high school classes, bumming smokes from the most jaded of teachers

after class. Road Rage was born out of a couple of garage-sale guitars and the inevitable boredom of Sunday afternoons. In a way Mitch was still holding on to that image of the band, though he couldn't bring himself to tell Damian as much after all this time [Delayed probe point]

Probe sentences: Damian *started/ started playing/ started listening to* the guitar.

Item 12

Pam was enjoying her lunch that Alan had prepared for her this morning. But about halfway through her chicken sub, her boss called her into his office. This wasn't the first occasion her lunch was interrupted for some triviality, and so Pam took the liberty of bringing her food with her. Once inside his office, *Pam continued the sandwich*. [Immediate probe point]

Of course, it was a trivial matter that "needed" consulting. Her boss was flipping through carpet samples and wanted Pam's opinion. Helping her boss match carpet swatches with paint samples was not exactly what Pam had in mind for this job. She thought of these encounters, occurring several times a week, to be a test of sorts, of her patience more than her capacity for interior decorating. As her boss prattled on about the pros and cons of her two favourites, Pam began to wonder what her boss actually did here besides plan her home renovations. [Delayed probe point]

Probe sentences: Pam *continued / continued eating/ continued dressing* the sandwich

Item 13

Paul was becoming increasingly confused with the material for his PSYC 380 class. His instructor was extremely knowledgeable but perhaps was too bright to communicate the material to an undergraduate audience. During last week's lecture, Paul had begun inquiring about a particularly evasive concept just before the class ended. So at the outset of today's lecture, *Paul continued the question*. [Immediate probe point]

When the sound of the final bell came it was almost a comfort, even though Paul was left unsatisfied yet again. He grabbed his knapsack from beneath the seat and filed out of class with the rest of the students. Everyone rushed out to the front exit and bottlenecked through the doors to the bus stop. While the mob of students chattered and buzzed with the excitement of an ended school week, Paul was lost in the pages of the latest addition to his collection. For a year he had been under the spell of a little-known novella author out of Nebraska. How the man even got published was part of the mystery. [Delayed probe point]

Probe sentences: Paul *resumed / resumed asking / resumed answering* the question.

Item 14

Vera and Matilda met on the veranda at 4:00PM for snacks and gossip. Matilda had much information to divulge and she enjoyed delivering her news between sips of hot tea for dramatic effect. At four o'clock sharp, the maid brought the refreshments to the ladies waiting silently in a pair of lawn chairs. Before any exchange of information, *the ladies finished the biscuits*. [Immediate probe point]

Vera was eager to hear the news of the affair and Matilda was happy to oblige between appropriate outbursts of mild outrage and disbelief. Of course it was no secret that Beatrice had been growing steadily unhappy this past year. Her husband had been taking on quite a few extra hours at the firm to keep up with the mortgage. The children were both away at schools out of province. The affair was really inevitable, Vera and Matilda agreed. Vera thought it was a wonder that it had not happened sooner. Matilda added that it was at least fortunate that Beatrice's husband hadn't found out about it yet. [Delayed probe point]

Probe Sentences: The ladies *finished/ finished eating/ finished baking* the biscuits.

Item 15

Sebastian was commissioned by The Museum of Canadian History for an exhibit on the Canadian Prime Ministers. Sebastian was the artistic director of the exhibit and his job was to create large-scale depictions of the Prime Ministers. Sebastian rented a studio loft near Rideau Canal and got to work on Sir John A. Macdonald. After several long sessions, *Sebastian finished the portrait*. [Immediate probe point]

His knuckles were stiff. He hadn't realized how cold it had become inside. He hopped down off the stepladder and snatched a sweater off the back of the closest chair. A cool draft was picking up from the bay windows facing the canal. Sebastian hadn't noticed that the light streaming onto the floor had paled and darkened. The draft was becoming loud and blustery, surging up against the windows and filling the loft with an irregular rattling. Sebastian did as best he could to cover the lower windows with some blankets and quilts lying around the couch. [Delayed probe point]

Probe sentences: Sebastian *finished/ finished painting/ finished appraising* the portrait.

Item 16

Jane was having trouble dealing with her alcohol addiction. She had gone clean for six months, attending AA meetings regularly, but recent stressors had thrown Jane off course. This morning, Jane didn't even get out of bed before turning to the whiskey stored at her bedside. And in just a matter of seconds, *Jane finished the bottle*.

[Immediate probe point]

But no matter what, Jane couldn't get her mind off her divorce and losing the custody battle. The economic recession was an all too present concern, costing her half her hours at work. But these worries were subordinate to her concerns for Jeannie, the five year old daughter. Everything she did now was an effort at marketing herself as the better parent, but the odds felt stacked against her. In a moment of clarity, she realized that she needed to change a great deal if she wanted win custody of Jeannie. Frankly, she was running out of ways to cope. [Delayed probe point]

Probe sentences: Jane *finished/ finished drinking/ finished filling* the bottle.

Item 17

It had been 3 long months of renovations and now the house was finally ready to be lived in. But a few small jobs still needed attention. Alan had promised Sally, a new bookcase for her home office and he already collected the wood that he needed for the job. Just a day before moving in, *Alan completed the shelves*. [Immediate probe point]

The house was much improved since before the renovations and Alan and Sally were eager to decorate. They both had their own pet projects picked out, though they thought it only fair to allow some room for each other's "consultations". Alan declared his domain in the kitchen, and the plans were beginning to coalesce in his head, from spice racks to salad tongs. Sally knew that the gift for cuisine was somewhat more apparent in Alan than herself, so she mostly deferred to his better judgment on these matters. [Delayed probe point]

Probe sentences: Alan *completed/ completed building/ completed dusting* the shelves.

Item 18

Staring at her rough draft on her computer screen, Sandra sighed. She was satisfied with the font that she had selected but was a little less than pleased with the phrasing. Sandra and Tom still hadn't decided on a caterer and the unfinished text before her was only making her feel more anxious. Taking a deep breath, *Sandra continued the invitation note*. [Immediate probe point]

Next on her to-do list was the reception seating arrangements and the menu selections followed that. Suddenly, Sandra remembered that she still had to contact the band they had finally settled on. This was not what she had in mind for her grand day. Well the day itself was going to be grand indeed, but she did not expect that she would be bearing the burden of the whole thing. Sandra pushed her chair out from the cluttered table, and sat very quietly for a while. She turned her gaze to the phone and thought of Tom. [Delayed probe point]

Probe sentences: Sandra *continued/ continued writing/ continued sending* the invitation note.

Item 19

Josh was a freelance computer programmer and he had just been hired for a job at Technology Software Solutions Inc. The company was looking to advance their R&D division and they needed someone with experience in various domains. Josh was responsible for a new inventory-tracker program that would be compatible with Blackberry as well as other hand-held devices. Eager to impress his new boss, *Josh started the code*. [Immediate probe point]

Josh had only been at the company for a month and was eager for a chance to show off. No more than three minutes had passed when "the competition" poked his head over the cubicle wall. Josh always thought of Larry as the office troll, and was actually a bit surprised that the little man could reach his head that high. Larry had probably climbed onto his desk to do so, thought Josh. He had that faintly devious half-grin stuck on his face, as he always did when confronting his favourite of nemeses. Josh was certain that a guy like him must have accrued quite a few. Josh took comfort in playing the bigger man, and greeted Larry as cordially as ever. [Delayed probe point]

Probe sentences: Josh *started/ started writing/ started reading* the code.

Item 20

Fred was thrilled that the summer had finally arrived and couldn't wait to start spending time outside. Fred even relished doing summer chores, which was fortunate because his front yard needed attention. The grass had grown so long that their home had lost all curb appeal. Hooked up to an extension cord from the garage, *Fred started the lawn.*

[Immediate probe point]

Over in the driveway, his 8 year old daughter Sam and her pet dog Pugly were supervising a pink lemonade stand. Fred was proud to see his daughter, a chip off the old block, with some entrepreneurial initiative. That was more than he could say for himself on this beautiful Tuesday morning. Fred was the proprietor of a chain of jewellery outlets in the broader metropolitan area. He had built up his business to the point that he could take such liberties and rely on his staff to handle the everyday grunt work. Still, Fred preferred to take on an active role in his company. He felt it was good for employee morale, which ultimately, is good for business. Fred has made a habit of visiting each of his seven branches on a weekly basis, making sure that things were running smoothly throughout his little empire. [Delayed probe point]

Probe Sentences: Fred *started/ started mowing/ started watering* the lawn.

Item 21

Tammy was ready to deal with the mysterious odour that was emanating from the kitchen. Because she could not identify the exact source of the smell, she decided to scrub the kitchen from top to bottom. She had already emptied the kitchen of every last trace of food and was ready to get rid of the grime. Getting on her hands and knees, *Tammy completed the fridge.* [Immediate probe point]

Just then she noticed that her mail had fallen off the counter. She made her way over to lift the envelopes off the floor. Leafing through the various items, Tammy felt overwhelmed. Creditor after creditor was after her. She had been living above her means for a while without realizing how deep in debt she had got herself. A few months earlier, Tammy had a shopping frenzy and financed a car, an LCD television and a new washer and dryer. To boot, she had accumulated thousands of dollars in credit card debt. With her monthly expenses far exceeding her income and interest rates as high as 20%, Tammy came to terms with reality. She would be forced to declare bankruptcy. [Delayed probe point]

Probe sentences: Tammy *completed/ completed cleaning/ completed stocking* the fridge.

Item 22

Grace was excited about the prom because she had been putting together her own outfit from scratch. Her mom was a seamstress and after learning a few tricks, Grace felt like a natural with a needle and some fabric. Immediately after class, Grace rushed to her mom's workstation in their basement. With her foot on the pedal and a few pins pursed between her lips, *Grace continued the dress.* [Immediate probe point]

When the phone rang on her bedside table, she dragged herself away. Following her mumbled hello, her friend Kylie began babbling on at a mile a minute on the other end of the line. Kylie had her own beau to bring to the ball, another rising football star named Chad. Lately they had been chatting daily about their dates, or rather Grace listened daily to Kylie go on about this latest crush. The phone calls used to be less regular, but they had a lot of different periods at school this year compared to years previous. Grace was glad to oblige her friend. [Delayed probe point]

Probe sentences: Grace *continued/ continued sewing/ continued washing* the dress.

Item 23

Justine was in the process of installing the new operating system on her computer when Mr. Sellers interrupted her with an urgent request. Many of the expense reports were being filed incorrectly lately and this was interfering with the processing of accounts. Mr. Sellers wanted Justine to take over a note he was working on that addressed this issue. Picking up where Mr. Sellers left off, *Justine completed the memo*. [Immediate probe point]

Once she got back to her own desk, she sat down and took a minute to look out the window and sip from her coffee. Having a window in her office was certainly a perk, but having one of the few trees on the lot just outside it was an added bonus. Justine had lost count of the hours spent doing “faux-work”, collecting her thoughts for whatever projects she had going. She had already honed her favourite technique, “creative contemplation,” to a fine science. Taking a pad of paper and her shiniest pen, she turned her chair to face the window, crossed her legs, rested the pad on her lap, and adopted a pensive expression. [Delayed probe point]

Probe sentences: Justine *completed/ completed writing/ completed reading* the memo.

Item 24

Lena dreaded requests for letters of recommendations from her employees, but she was happy to do it for Ellen who was a motivated worker. Lena asked Ellen for two-week’s notice because articulating a person’s qualities could be a long and arduous process. Lena was just a few sentences into the task, when she was interrupted by a phone call from an important client. Once she hung-up, *Lena continued the letter*. [Immediate probe point] Before long, the phone rang again. Lena frowned and muttered for a moment, expecting it to be the same client calling back for yet another clarification of some trivial minutiae. She braced herself before picking up the phone and put on her most placating tone. She was pleasantly surprised to hear her mother Judy on the other end, but she soon recognized the stress in her voice. She asked Lena if she was doing alright. Lena replied that she was quite fine and asked her mother the same. Judy said it was probably nothing, but asked Lena to pay attention to the news today. Something peculiar was stirring up. [Delayed probe point]

Probe sentences: Lena *continued/ continued writing/ continued reading* the letter.

Filler Items (24)

Filler 1

Someone was pounding on the door when Josh was finally startled from his sleep. He wondered why someone would be bothering him at this hour, but a glance at the clock revealed it was already halfway through the afternoon. Josh wasn't the sort to sleep the day away, and this just added to the bleary confusion that shortly follows waking up. He also wondered why they would be pounding on the door when there was a perfectly good doorbell right next to it.

In his head Josh ran through a short list of friends he might expect at the door today, and a short list of unpleasant acquaintances he had been dodging for the month. This included, in no particular order, the landlord, the neighbor downstairs, and that mailman who never really liked him. It was only then that he realized the pounding hadn't stopped and he was still in bed, wondering what was going on. Josh collected himself and made his way to the door.

Probe Sentence: He wondered why anyone would be bothering him at this hour.

Filler 2

Cindy was just glad to be home after the long day at the agency. Flu season was in full swing, and as was usually the case at her work, more than a few people tried to cash in on the bug going around so they could catch a break from work. Cindy herself had been mulling over the thought of a nice long weekend out of town, to "recuperate" of course. Unfortunately, her coworkers had beaten her to the punch.

Her supervisor had called her the evening before. She knew what she was in for when she heard the less-than-genuine concern in her supervisor's voice as she asked "You are feeling all right, aren't you?" She was one of only seven people in her section to come in for the day, which meant roughly double the workload during the busy hours. She could have felt angrier about her "sick" coworkers leaving her with such a mess that day, but really she was just a little annoyed that she hadn't thought far enough ahead as they had. They got theirs, and she would get hers next time.

Probe Sentence: Cindy was glad to be at the agency after the long night at home.

Filler 3

The sauce was simmering away on the back burner as David carefully picked out a noodle from the pot in front of him and flung it against the wall. It stuck for one, two, three seconds before lazily peeling off and landing in the garbage. David was satisfied with this, and now all that was left was the salad.

He turned down the burners and tuned in briefly to the voice of the news announcer on the television in the other room.

Next, he began rummaging around for that salad bowl he had bought for tonight. How it had already ended up in the back of the cupboard was curious, but unimportant at the moment. David had less than fifteen minutes before Liz was supposed to arrive, and he wanted to perfect the dish before she did. The voice on the television caught his ear again. He hadn't really been paying close attention to the news stories, but the

announcer's voice had changed. David usually left this news show on for the bubbly chirpiness of the female anchor, but now something was different. She sounded tense. He slowly walked over to the television.

Probe Sentence: David scooped up a potato from the pot in front of him.

Filler 4

Now that she was out there in her patch of sun, Carol couldn't remember why she hadn't been using this back porch of hers for so many months. Newspaper in hand, tea cooling by her side, she couldn't even remember having the free time to even think of the back balcony. Things had been so busy lately.

It was the interim between the kids finishing school and starting summer camp that always drained the last bit of energy out of her.

But alas, camp had started and at that moment nothing was going to intrude upon this rediscovered sanctuary that was her balcony. In the evening the sun came over the building and shone its light into the yard before creeping to the chair that Carol was nestled in. She enjoyed anticipating the warmth that slowly fell upon her. She should have been running some errands, she thought. Then she reminded herself to forget about it for the day.

Probe Sentence: Carol hated being indoors.

Filler 5

Keith took a moment to take in the scene and assess the situation. They were down to a quarter of the glasses usually on reserve; dish soap had run out a day ago; in the kitchen the sous-chef's mise-en-place was not fully stocked; meanwhile, the patrons kept filing in; the floor was starting to fill over maximum capacity and there wasn't half a chance in hell of anyone coming to the rescue.

After all, they all had their hands equally full somewhere in the far reaches of the restaurant.

'I am the busboy,' Keith thought, 'and I am the last line of defense before utter collapse; I'll manage, I'm good, I am very good...' Before he could get any further, his train of thought was derailed by a light smack to the back of the head. He turned to see his boss next to him, mildly puzzled and annoyed, sweating as profusely as he was. Only inches away, Keith's boss yelled into his ears, "What's up, kiddo?" Keith shook his head a bit and then gave a thumbs-up, the only communication his boss usually needed from his employees. "Onward to the frontiers of culinary mayhem" he thought...

Probe Sentence: Keith took a moment to take in the scene.

Filler 6

Jenkins had just about counted all the lights for the second time on the towers of computer machinery that lined the wall of the control room. When he finished, he let slip a small sigh and went for a sip from his mug, which was just as empty as it was when he last went for it. With a muffled grunt he got up from the office chair and plodded over to the coffee machine to start a new pot.

He glanced around the room a bit while the machine began to percolate. Johnson was trying to beat his own personal record for the slowest full spin achievable on a dreadfully uncomfortable office chair. Mallory was sparing himself the ache of the chair and giving his legs a stretch while he went over the test chamber readouts, checking and double-checking. "Check." "Mark." "Repeat." Jenkins' eyes glazed over as he reflected on the lethargic scene before him. This was the top experimental facility on the continent, the cream of the crop that most people have never even hear of. "A Monday is still a Monday," he thought.

Probe Sentence: And went for a sip from his mug.

Filler 7

Wes and Jimmy walked back home from the cute little ice cream shop down the street. They were high-school classmates, neighbours, and friends for a few years now; the acquisition of frosty treats was one of their favourite rituals. When the weekly heat waves rolled in at the height of summer, one of them would be knocking on the other's door for a snack run.

Oddly enough, this would only happen if the temperature reached at least thirty degrees. In a way, that was just another part of the ritual, and that suited them just fine. The journey they took today was well deserved, with the current heat wave entering its second week. Wes was going on about the next cult horror film or independent shorts festival he had heard about, as was his usual fare for conversation. Immersed as he was describing his latest film obsession, it took Wes a moment to notice that Jimmy had fallen behind, and he turned to find him. There Jimmy stood staring down at the sad, melting lump of chocolate-caramel ice cream at his feet, while what was left in his cone slowly crept and dribbled down over his fingers. Wes couldn't help but burst into laughter at his friend, so thoroughly dejected over ice cream.

Probe Sentence: They were high-school classmates, neighbours, and friends.

Filler 8

A Russian newspaper reports that the Buffalo Sabers' star forward, Alexi Minkoff (dubbed The Artist by adoring fans), was offered a contract extension by the organization. The terms of the contract include 6 million dollars for 1 year in addition to the Sabers' captaincy. Rumors are circulating that the Sabers' general manager, Phillip Odelle, is not looking to re-sign the team's current captain, Artu Finn, who will likely pursue free agency once the deadline has passed.

Finn's tenure as the Buffalo captain is the second longest in franchise history, falling 1 year short of Scott Davidson's 11 year run.

Alexi Minkoff is considered one of the most talented players in the NHL, but his career has been characterized by sporadic play. Minkoff has always been a source of frustration to his coaches, who find themselves short for an answer to his cold streaks. There has been some speculation that Minkoff played his best hockey as substitute captain in Finn's absence over the past few years. It is believed that this notion is the motivation behind the general manager's current efforts to sign Minkoff and relinquish Finn. Ideally, this move would ignite the dormant "Artist" and free up cap room for an additional player.

Probe Sentence: Was offered a contract extension by the organization.

Filler 9

One morning Ethel awoke to find her husband of 37 years, Jerry, circling the backyard snapping his fingers profusely. Although she had never seen this behavior before, she thought little of it. But as time passed, Ethel noticed that Jerry's finger-snapping ritual became increasingly routine.

When she confronted him about it, Jerry simply replied that he snapped his fingers to keep the pigeons away.

Ethel was content to accept this rationale until Jerry began snapping his fingers nearly everywhere he went, including places pigeons rarely wander like restaurants and indoor shopping malls! In distress, Ethel suggested that Jerry visit a psychiatrist. Although Jerry considered this a silly idea he was prepared to indulge his wife and hopefully alleviate her concerns. On the day of his appointment, Jerry obediently made his way to the Doctor's office and waited patiently to be called in to see the psychiatrist. Sure enough, when Jerry was called, he rose and entered the office snapping his fingers. Puzzled, the doctor asked Jerry why he was snapping his fingers.

"Well doctor", Jerry responded, "it keeps the pigeons away."

"But Jerry" said the Doctor, "there are no pigeons in here."

"So you see, doctor? It works!"

Probe Sentence: Ethel awoke to find her husband of thirty-seven years.

Filler 10

The only two things keeping Gordon awake at this point were caffeine and an impending sense of doom. He had made it onto the tramcar from his residential neighborhood in record time, with most of the necessary dressing, grooming, packing, and even eating accomplished en route. Unfortunately, as he well knew, he was still running forty minutes late, and much to his chagrin, would have a cozy twenty minutes to worry himself to death in transit.

He dreaded the glances and chuckles from his co-workers when he would shuffle in late for the second time in a week.

Sure he was the new guy, but damn them, he had earned his place here. He had graduated at the top of his class and had four years experience with some hush-hush government interests that he sacrificed for a chance to work here. As far as administration was concerned, though, he was yet to prove himself.

Probe Sentence: He had made it onto the tramcar.

Filler 11

The alternatives had been pared down over the last few months to a single undesirable option. Fortunately, Walter had seen this coming and braced himself accordingly, though he wondered if there was anything that could truly prepare him for what he was about to attempt. He got up from his computer chair and shuffled over to the next room to find the phone.

His footsteps felt heavier, the receiver felt colder, the buzz on the line sounded sharper. He dialed the number from memory and waited with his hand over his eyes. Walter and his sister had always gotten along but they weren't that close. Walter knew why, for his part. There was this sense of competition and squaring-off between them that he had always resented. When she heard his voice on the other end, he could tell she knew, she knew he needed her help with something. Walter always knew that you could hear it in someone's voice when they were smiling, but he now learned that the same could be said of a mischievous grin; he made a note to remember that.

Probe Sentence: The alternatives had been pared down over the last few months.

Filler 12

Christine approached the theatre in trepidation. Two months earlier, she agreed to give a talk at the neuropsychology conference and was anxious about it ever since. As she made her way down the aisle toward the front of the room, Christine scanned the audience.

"Good" she thought to herself, "there are only about 50 people here."

Christine assured herself that once she got started with the talk, her nerves would calm and she would be able to get comfortable.

Christine loaded her slides onto the computer, opened the talk, and looked out into the audience. Her chest pounding, lungs tightening, and palms sweating, she projected her introductory remarks with artificial confidence. Everything was going well until her first slide of results appeared on screen. Her graphs were gone! Christine stopped short in horror. Her mind racing, she wondered what could have happened. Was this an early draft? No, she only saved the final version to her memory stick. Fumbling for a justification, Christine realized that she had written her presentation on a Mac and was now using a PC. These casualties often occurred in translation from one operating system to the next. "Why didn't I think of this in advanced?" Chuckling nervously, Christine apologized to the audience who were seemingly just as tense as she was.

Probe Sentence: And had been anxious about it ever since.

Filler 13

Father's day was approaching and Bonnie thought it would be nice for all the siblings to chip in and get a gift for their dad. They weren't a very demonstrative family and gifts for birthdays and other such occasions were never expected. However, Bonnie felt that it was high time for a change.

Bonnie and her four younger sisters, Ellen, Matty, Cathy and Patricia had lost their mother 5 years earlier to an aggressive cancer.

It was a very difficult time for everyone especially for their dad, Charles, who bore the added anxiety of being alone for eternity. The situation only worsened, however, when Charles met Jacqueline, a divorcé from New York. The two hit it off immediately and got engaged within six weeks of their meeting, still not a full year since the girls' mom died. A month later they were married. Intellectually the girls understood that their dad needed to be with someone, but emotionally, they just couldn't welcome this strange woman into their home. Fights ensued and before long Charles found himself torn between his wife and his children. Over the next few years, tensions diminished, but interactions at home

were marked by a suppressed disdain. Whenever the girls did something as a family they would leave Charles out of it in the fear that their “wicked, old stepmother” would tag along. Looking back over the past 5 years, Bonnie felt sad that her relationship with her dad had become so distant. She still loved him and felt that he deserved to know how much he meant to her and her sisters. Bonnie was determined to make this father’s day special.

Probe Sentence: Especially for their uncle, Charles.

Filler 14

Ezra was excited for The Swedish Model launch party. The Swedish Model was an independent record label hailing from Sweden that recruited the best Scandinavian talent. They have a uniquely progressive philosophy – all their music is offered online for free. “How do they make their money?” you might be wondering.

Advertising – supposedly, that is how all free services make their money these days. But I digress... Now The Swedish Model was looking to set up shop in Montreal, a hub of sorts for independent music. As soon as Ezra got the facebook invite to the launch party he signed up to attend the event. Ezra was perpetually on the hunt for the latest and greatest in underground music, and The Swedish Model group was rather compelling. A week before the event was scheduled, Ezra received a notice from one of the organizers. If he provided his name and email address in a message to the organizers, he would be entered in a draw to win one of three prizes. Ezra was reluctant. He felt silly signing up for these raffles; after all what were the odds of him actually winning a prize. He thought seriously about that for a moment: “What *were* the odds of him actually winning a prize?” Ezra decided to view how many people were attending the party on the facebook event page.

“147. Not bad.”

“Half of them won’t even show up” Ezra thought “and the other half are probably equally as reluctant as I am to sign up for the prize.”

All in all, Ezra figured his chances weren’t that bad and so he invested the minute of effort required to submit his name and email to the event organizer.

Probe Sentence: Now, The Swedish Model was looking to set up shop in Toronto.

Filler 15

Maria and Mario were vacationing in Rio-di-Janeiro, Brazil for two weeks and were enjoying every moment of their vacation - but it was finally coming to a close. They had a flight to Paris scheduled to take off at 7pm Monday evening. It was Monday afternoon and they were all packed, but Maria and Mario wanted to get one last taste of the city before they left.

They went down to the hotel restaurant, which had a terrace overlooking the Ipanema beach.

One drink led to another and before long, Mario noticed that they had merely one half-hour to make it to the airport! Bafangul! That was hardly enough time to collect their things and make it through customs on time to catch the flight. Maria smiled and said “Hey! What’s so bad about another day of vacation?! We’ll catch the next flight

tomorrow.” Mario agreed that this was the sensible thing to do. After all they were really having a good time and they didn’t have to be back to work in Florence for another week. After a few hours of feasting and socializing with the other guests, Maria and Mario had their fill and returned to their room for bed. The next morning, Maria went online to book another flight, but a headline caught her attention: “Air France flight 447 out of Rio disappears over Atlantic.” Rummaging through her papers, Maria located her ticket and scanned the flight number. It was 447. She yelped and fainted.

Probe Sentence: They still had six hours to make it to the airport.

Filler 16

Ivan returned from a conference nearly a month ago. He had accumulated approximately \$300 in expenses but getting reimbursed was no easy process. First he had to fill out the appropriate form and attach all the receipts organized according to peculiar categories. Next he had to track down his supervisor for his signature and the funding code.

After that, Ivan had to contact his supervisor’s joint grant holders for their signatures before finally submitting the expense report to payroll.

Ivan made sure to submit the report on payday, which would give HR a full two weeks to get all of the documents together in time for the next pay session. But sure enough the red tape got sticky. One day before payday, Ivan received an email from payroll requesting supporting documents. As he read the email, Ivan’s skin curled. It was now a month since the conference and that means he won’t be able to make his credit card payments on time. Would HR pay his interest once the payment deadline past? He doubted it.

Probe Sentence: Ivan made sure to submit the report well before payday.

Filler 17

Ever since 9/11, U.S. customs has been threatening to tighten up their border patrol. It has taken nearly 8 years, but finally, on June 1st, 2009 it became mandatory to present a passport when entering the U.S. by land. This was not welcome news for Valerie, who had been without a passport since 1997.

She had two siblings living in New York that she enjoyed visiting regularly.

Her sister Melanie was due to give birth in early July, and Valeria had planned to be there for the birth. Valerie knew that procuring a passport would be a tedious process. The application required her to submit here latest passport, which she had long lost. This meant that she would have to hire a commissioner of oaths to attest to this fact and also to assure that she was in fact who she claimed to be. It was mid June when Valerie finally got all of her documents together for the application. She elected to go down to the bureau in person, as reportedly, this facilitated the application process. The wait was long, but that was to be expected. After about an hour, her number was called. Valerie approached the clerk and turned over her folder to him. She stood silently as the clerk shuffled through the papers offering an occasional grunt of approval. The clerk filtered through the various supporting documents with a dexterity that only comes from years of repeating the same menial task. All was in place. “Would you like to receive your passport early?” the clerk request.

“Sure, how much?”

“It would be an extra 30 dollars.”

“That sounds reasonable. I’ll take it. When would it be ready?” Valerie asked.

“Next Monday morning, it will be ready for pickup”

“Great.”

Valerie left the bureau satisfied. This was much easier than expected.

Probe Sentence: It became mandatory to present a passport.

Filler 18

Kevin was not particularly enamored by the prospect.... This was the second academic conference in a week, and he just found out there was yet another scheduled in a few days. He didn’t mind conferences - that wasn’t the issue. He quite liked them.

In fact, he thought they were a fantastic opportunity to share ideas, gain some experience,

and make adjustments to one’s own thinking.

At least this was true when you knew what the hell anyone was talking about. When Kevin got called into work at the tech desk that morning, he didn’t exactly know what he was getting into. He just wanted a few extra hours for a chunk of change. He figured he’d probably just be covering for someone, or he’d help set up a couple of projectors and laptops. If they had mentioned that he’d be sitting in on an annual meeting of the international microbiology experts, just in case something went wrong with a laptop or a microphone, he would have remembered to bring a book. “You know what, I’m always gonna carry a book from now on,” Kevin muttered. He didn’t even know what the next conference was supposed to be about. It had better be about spaceships or dinosaurs or something.

Probe Sentence: He didn't exactly know what he was getting into.

Filler 19

“And a dead bird crashed straight through the window – already dead, mind you! – and landed right in her stew! I tell ya...” Laura hoped she didn’t look completely oblivious, but she swore she could actually feel her brains leaking out her ear. The worst part of Uncle Herb’s tall tales wasn’t the absolute lack of any entertainment value, or even the sheer, unabashed implausibility of the plot.

It was the fact that he could tell the same story fifty times without variation, without missing a beat, every gesture exactly in its place.

Actually, even worse was that he WOULD tell the same story fifty times – to the same relatives, at every family gathering. Like it was brand spanking new. His repertoire was not even as sizable as one might expect given his ripening age and his questionable past experiences. He was a good guy, to be sure, and he didn’t have a mean bone in his body. Unfortunately, he didn’t seem to have an interesting bone in his body either. As far as eccentric uncles go, Laura felt Uncle Herb must be kind of disappointing.

Probe Sentence: Laura hoped she didn't look completely oblivious.

Filler 20

“The time is now 7:23 am. All subjects begin wake cycle. Good morning, subjects.” Louis woke slowly as his eyes slid open, and he lay motionless for a moment. 7:23 am. A completely arbitrary time to set an alarm, he thought. It might as well be at 7:30, or 7:20, or 7:14, or anything for that matter.

At the very least it was consistent.

The wake-up call always said it was 7:23 am; whether it really was or not, Louis never knew, and he couldn't remember ever caring. It could be any time at all, morning noon or night, but that didn't really seem important. Not that there was any way to actually verify what time it was, of course, since there had never been any windows in his room. Well I'd better get up, Louis thought. The last time he slept in, there was no lunch waiting in the chute that day; then again, the time he slept in before that, nothing happened at all. There were very few rules to follow at least, and sticking to them was usually an easy enough guarantee of safety. Usually. It wasn't the punishments that worried him; it was the uncertainty.

Probe Sentence: Louis woke slowly as his eyes slid open.

Filler 21

Lou spends most of his time at Marissa's house these days. But on the rare occasion that he does come home, he invariably finds that his roommates have left the apartment in total disarray. Today was one of those rare occasions. He planned to work from home but the sticky kitchen floor was devastating to the prospect of productivity.

Lou was a classic procrastinator, and any minor distraction was enough to compel him away from his desk.

But as he considered the laborious effort that goes into scrubbing a greasy floor, he was equally compelled to remain seated. He considered his options for a moment. Tapping his fingers on his desk one at a time, he hummed The Clash tune to himself “should I stay or should I go.” The floor won over. It was simply too distracting. Lou lifted himself from his chair and moseyed on over to the closet to retrieve a bucket and a mop. Another familiar rock tune played in his head. Before long, Lou got to thinking about birds.

Probe Sentence: He was equally compelled to remain seated.

Filler 22

You have to wait until the summer before you understand why Montreal has the designation “city of festivals.” From the minutest sidewalk sale, to the midsize Fringe Festival and the grand, international Jazz and comedy festivals, Montreal truly comes alive in the summer. This weekend, St. Laurent – a street that splits the city in two, both geographically and culturally – was shut down for that annual sidewalk sale.

Genevieve and Michael lived just a few blocks apart, but each on either side of the cultural divide.

Michael, an Anglophone, lived on Clark Street one block west of St. Laurent, while Genevieve lived on St. Dominique, one block east of St. Laurent. Never before had their lives crossed, but both were drawn to the street festival on this sunny Saturday afternoon. Taking a leisurely stroll down St. Laurent, Michael wandered into Turquoise, a furniture dealership. He had passed the store many times before and was always attracted to the

window displays of colourful Indian tapestries draped over a selection of East Asian antiques. Once inside, Michael realized that the window displays truly delivered on their promise. From wall to wall the floor space was covered in an array of opulent armoires, tables and hand-woven cushions. But the merchandise was not all that captured Michael's attention. Nestled in between two rosewood bookshelves, Genevieve stood admiring an Asian robe. Her concentration broke for a moment and she glanced up at the man she would one day marry.

Probe Sentence: But each, on either side of the cultural divide.

Filler 23

Caleb never imagined he'd be a rock star one day. Yes, he did grow up on the road, traveling through the Deep South with his father who was a Pentecostal preacher. But that was the only obvious similarity. It wasn't until he was fifteen that he had even heard a rock song.

Until that moment, the only music he knew was Gospel.

Being a Pentecostal Christian, he was prohibited from listening to anything else. His memory of the time he first heard rock music is as lucid as the moment it occurred. His father had recently left the church and his parents were going through a rough divorce. It was a typical Tennessee summer day as Caleb walked home from school in the dry heat. Along the way, he stopped in to a convenient store for a refreshing drink. A song played on the loud speaker. It was Crimson and Clover by Tommy James and The Shondels. The sound was unlike anything he heard before. The reverb guitars descended the progression with a phaser effect that made it sound like the individual notes were competing to be heard. The sound it produced was mesmerizing. Caleb could recognize that it was the same chords played "over and over." The attraction of the song was in the arrangement, not the melody. This fascinated Caleb and it reminded him of what his father last said before he left the church. "Son, there is nothing special about what we are offering people here. It's all in the dress-up." The thought brought him some closure and marked the beginning of an entirely new life.

Probe Sentence: His parents were going through a rough divorce.

Filler 24

Bill hated the rain! He felt that the vast majority of umbrellas on the market were too feeble to withstand an ordinary rainfall. Furthermore, whenever he was accompanied by Tina, she had a tendency of hogging the space underneath the umbrella's protection. Thus, there was virtually no way to come away from a rain shower un-violated. He couldn't understand why they didn't manufacture umbrellas strong enough to withstand the wind and large enough to fit two people comfortably. Another problem with the standard umbrella is that after a short distance, it became difficult to hold one's arm up in the necessary position. Moreover, you couldn't hold an umbrella while riding a bicycle; Bill often found himself stranded somewhere with his bike when it started to pour. Bill fancied himself an enterprising young man and he figured that he could carve himself a niche in the umbrella industry addressing the common umbrella's shortcomings. There was a television show on CBC called The Dragon's Den, which

invited entrepreneurs to pitch their product or service. Bill was exhilarated by the prospect of appearing on the show and so he got to working on series of prototypes for a new umbrella manufacturing company.

Probe Sentence: It became difficult to hold one's arm up in the necessary position.