The role of suppression in figurative language comprehension⋆

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Abstract

In this paper, we describe the crucial role that suppression plays in many aspects of language comprehension. We define suppression as a general, cognitive mechanism, the purpose of which is to attenuate the interference caused by the activation of extraneous, unnecessary, or inappropriate information. We illustrate the crucial role that suppression plays in general comprehension by reviewing numerous experiments. These experiments demonstrate that suppression attenuates interference during lexical access (how word meanings are 'accessed'), anaphoric reference (how referents for anaphors, like pronouns, are computed), cataphoric reference (how concepts that are marked by devices, such as spoken stress, gain a privileged status), syntactic parsing (how grammatical forms of sentences are decoded), and individual differences in (adult) language comprehension skill. We also review research that suggests that suppression plays a crucial role in the understanding of figurative language, in particular, metaphors, idioms, and proverbs.

Keywords

Figurative language; Psycholinguistics; Suppression; Metaphor comprehension; Language comprehension; Cognitive processes

1. Introduction

Whenever we comprehend language, superfluous information is activated. Sometimes this superfluous activation arises from the external environment, as when we conduct a conversation in a noisy restaurant, or watch a movie while someone in the row behind us is whispering. Other times this superfluous information is activated internally, as when we have to deal with the competing meanings of a word or phrase, or the alternate references of a pronoun.

In our research we have proposed that a particular cognitive mechanism, what we call the cognitive mechanism of suppression, suppresses the activation of superfluous information. We have empirically illustrated the crucial role that a general cognitive mechanism of suppression plays in many comprehension phenomena. These include lexical access, how comprehenders understand or 'access' from their memory the meanings of words; anaphoric

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reference, how comprehenders understand to whom or what anaphors, like pronouns, refer; cataphoric reference, how words that are marked by cataphoric devices, such as spoken stress, gain a privileged status in comprehenders' mental representations; syntactic parsing, how we decode the grammatical forms of sentences into meaning; surface information loss, the finding that seemingly superficial information, such as syntactic form, is forgotten more rapidly than seemingly more important information, such as thematic content; and general comprehension skill, which is skill at comprehending linguistic as well as nonlinguistic media.

In the first half of this paper, we shall review some of the experiments that demonstrate that a mechanism of suppression, which attenuates the activation of superfluous information, plays a powerful role in language comprehension. Indeed, the role is so crucial that persons who are less skilled at comprehension are marked by less efficiency in suppressing the activation of superfluous information. In the second half of this paper, we shall review research that suggests that suppression also plays a crucial role in the comprehension of figurative language.

2. The role of suppression in language comprehension

2.1. The role of suppression in lexical access

During lexical access, the cognitive mechanism of suppression attenuates the activation of superfluous lexical information that is activated when a printed word is read, or a spoken word is heard. This information might be the meanings of a word that are not relevant to the immediate context – for example, the saloon meaning of *bar* in the pun *Two men walk into a bar and a third man ducks*. Or the superfluous information might be other words or phrases that are related to the sound pattern of a spoken word or phrase, as in the classic *new display* often erroneously interpreted as *nudist play*.

Most models of lexical access propose that multiple types of information are activated when we read or hear a word; our research demonstrates that the mechanism of suppression dampens the activation of the unnecessary information. Gernsbacher and Faust (1991) empirically demonstrated that suppression – not decay – reduces the activation of inappropriate meanings of homonyms. That is, inappropriate meanings do not lose activation over time simply because their activation fades with time. Gernsbacher and Faust (1991) also empirically ruled out a mental 'winner takes all' explanation: When inappropriate meanings become less activated, it is not because the more appropriate meanings have become more activated. Indeed, using a parallel distributed processing network, Gernsbacher and St. John (in press) computationally demonstrated how sentence-level suppression can dampen the activation of contextually inappropriate word meanings. In our connectionist network, suppression driven by a sentence-level representation, what (St. John 1992; St. John and McClelland, 1990) refers to as a gestalt level of representation, was the only type of top-down feedback we allowed, and that alone allowed us to perfectly simulate the behavioral data.

Further demonstrating that suppression and not simply decay is the mechanism responsible for decreasing the activation of the inappropriate meanings of homonyms, Gernsbacher and

Robertson (1995) empirically demonstrated that suppression carries costs. After subjects read a sentence such as *He lit the match*, they were considerably slower and considerably less accurate at simply verifying that the sentence *He won the match* made sense. If after reading the *He lit the match* sentence, the inappropriate meaning of *match* simply decayed (i.e., the competition meaning of *match* simply returned to baseline), that meaning should not have been harder to activate in order to comprehend the subsequent sentence.

Furthermore, as we shall describe later in this paper, we have conducted many experiments demonstrating that individuals who are less efficient at suppressing many types of information, for example, the color of ink in a Stroop color naming task, hold onto inappropriate meanings considerably longer than do individuals who are more efficient in suppressing extraneous information. Most recently, Faust and Gernsbacher (1996) reported a right-visual field, left cerebral hemisphere advantage for suppressing the inappropriate meanings of homonyms; we find it less plausible that a decay mechanism would be similarly lateralized. From all of these findings, we conclude that the mechanism of suppression, which enables the attenuation of superfluous mental activation, such as the inappropriate meanings of homonyms, plays a crucial role in lexical access. Now, we shall turn to discuss the role of suppression in anaphoric reference.

2.2. The role of suppression in anaphoric reference

Anaphoric reference is the process by which readers or listeners understand to whom or to what an anaphor, such as a pronoun, refers. Gernsbacher (1989) discovered that suppression enables anaphoric reference by attenuating the activation of other non-referents. By non-referents we mean the people or things to whom or which an anaphoric expression does not refer. For example, in the sentence, *Bill handed John the tickets to the concert, but he took them back immediately*, the pronoun *he* is an anaphoric device, which most people interpret to refer to the referent 'Bill'. Gernsbacher (1989) discovered that correctly interpreting such anaphoric devices is not so much a matter of activating one of the two possible referents: Both are highly activated because they were just mentioned in the first clause. Rather, understanding to whom the pronoun *he* in the second clause refers, depends on how quickly comprehenders can reduce the activation of the referent to whom the pronoun *he* does not refer.

2.3. The role of suppression in cataphoric reference

Just as anaphoric devices enable reference to previously mentioned concepts, cataphoric devices enable reference to subsequently mentioned concepts. Cataphoric devices include such overt markers as stressing a word in spoken discourse, or bold facing a word in printed text. Presumably speakers and writers mark certain concepts with cataphoric devices because those concepts will play a key role in the text or discourse. Thus, it would behoove listeners and readers if those key concepts had a privileged status in their mental structures.

Gernsbacher and Shroyer (1989) demonstrated that in spoken English, the unstressed, indefinite article *this*, as in *So this man walks into a bar*, operates as a cataphoric device. We presented spoken narratives to college students, telling them that, at some point in each narrative, the original narrator would stop talking; when that happened, it was their job to

continue. For instance, one of the passages that subjects heard was the following: / *swear, my friend Vicky, every time we go to a garage sale, she just, uh, she just goes crazy. 1 mean like last Saturday we went to one near campus, 'n she just had to buy this ashtray, 'n y'know*, … As this example illustrates, each narrative introduced several concepts, for example, *Vicky*, a *garage sale*, an *ashtray*. In each narrative, one of these concepts was our experimental concept (e.g., *this ashtray);* it was the concept we manipulated.

We found that when we introduced concepts with the indefinite *this*, subjects mentioned those concepts considerably more frequently, virtually always within the first clauses that they produced, and usually with less explicit anaphors such as pronouns. We should mention that through cross-splicing we ensured that the acoustic properties of the matched narratives and their critical concepts were otherwise identical. These data demonstrate that concepts marked by cataphoric devices, such as the indefinite *this*, are more salient in listeners' mental representations.

Furthermore, Gernsbacher and Jescheniak (1995) discovered the role that the cognitive mechanism of suppression plays in enabling this privileged status. Suppression enables cataphoric reference by attenuating the activation of other concepts. In this way, a cataphorically marked concept gains that privileged status in comprehenders' mental representations, so that it can be referred to more easily.

2.4. The role of suppression in syntactic parsing

All the experiments that we have described so far demonstrate the role that suppression plays in attenuating superfluous lexical- or concept-level activation. We have also examined the role of suppression in attenuating superfluous sentence-level activation. Motivated by the adage, *Time flies like an arrow; fruit flies like a banana*, often attributed to Groucho Marks, Gernsbacher and Robertson (1996) hypothesized a role that the mechanism of suppression might play in syntactic parsing. We proposed that suppression attenuates the activation caused by parsing a previous syntactic form. As the *time flies/fruit flies* example demonstrates, once we have parsed the phrase *time flies* as a noun plus verb, it is difficult not to parse the phrase *fruit flies* in the same way. Gernsbacher and Robertson (1996) examined a more stringent situation by using phrases such as *visiting in-laws*, which can be interpreted either as a plural noun phrase (i.e., people who are related to one's spouse and come to visit), or as a gerundive nominal (i.e., the act of visiting people who are related to one's spouse).

In our experiments, we preceded sentences containing phrases like *visiting inlaws*, with sentences that required a similar or conflicting syntactic parse. We found that after subjects read a sentence like *Washing dishes can be a bother* they were extremely slow and frighteningly inaccurate to say that the sentence *Visiting in-laws are a drag* was grammatical. Similarly, after subjects read a sentence like *Whining students can be a bother* they were extremely slow and frighteningly inaccurate to say that the sentence *Visiting inlaws is a drag* was grammatical. We interpreted these data as suggesting that correctly responding to these sentences requires attenuating, or suppressing, the activation of the previous syntactic form.

2.5. The role of suppression in general comprehension skill

Gernsbacher et al. (1990) reported that adults' skill in comprehending written language was highly correlated with their skill in comprehending spoken language, and both skills were highly correlated with their skill in comprehending nonverbal picture stories. We also found a critical characteristic of less-skilled adult comprehenders: They are less able to suppress quickly the inappropriate meanings of homonyms.

We discovered this critical characteristic by testing more- versus less-skilled comprehenders on the following task: Subjects read short sentences, such as *He dug with the spade*, and following each sentence, they were shown a test word, such as *ace*. The subjects' task was to decide quickly whether the test word fit the meaning of the sentence that they just read. On experimental trials, the final-word of the sentence was a homonym, such as *spade*, and the test word was related to a meaning of that homonym, but not the meaning implied by the sentence, for example, *ace*. We compared how rapidly more vs. less-skilled comprehenders could reject a test word that was related to the inappropriate meaning of the sentence-final homonym, with how rapidly they could reject the same test word after reading a control sentence, for example, *He dug with the shovel*. The more time subjects took to reject *ace* following the spade shovel-sentence, the more activated the superfluous inappropriate meanings must have been. We measured this superfluous activation immediately (100 ms) after subjects finished reading the sentences and after an 850 ms delay.

Immediately after both the more- and less-skilled comprehenders read the homonyms, both groups demonstrated a reliable amount of activation of the inappropriate meanings. Indeed, at this initial test point, the two groups did not differ in how activated the inappropriate meanings were. In contrast, after the delay, the inappropriate meanings were no longer reliably activated for the more-skilled comprehenders, suggesting that the more-skilled comprehenders had successfully suppressed the superfluous inappropriate meanings. But for the less-skilled comprehenders, the inappropriate meanings were activated just as highly after the delay as they were immediately, suggesting that the less-skilled comprehenders were less able to quickly suppress the inappropriate meanings.

3. The role of suppression in figurative language comprehension

Although we are intrigued by Gibbs' (1994) proposal that the distinction between figurative and literal language is more apparent than real, we agree that some uses of language appear to be more figurative than others. In the second half of our paper, we shall address the role of suppression in the comprehension of figurative language, such as metaphors, idioms, and proverbs.

3.1. The role of suppression in metaphor interpretation

Gernsbacher et al. (1995) explored the role of suppression in metaphor interpretation. We began with the hypothesis that interpreting a metaphor such as *Lawyers are sharks*, involves enhancing attributes of the metaphor's vehicle, *sharks*, that are common to the metaphor topic, *lawyers*. So, interpreting the metaphor *Lawyers are sharks*, would result in enhancement of shark attributes, such as tenacity, ferocity, and aggressiveness. We augmented this hypothesis by proposing that metaphor interpretation also involves

attenuating, or suppressing, the attributes of the metaphor's vehicle that are not appropriate to (or concordant with) a metaphorical interpretation. So for example, interpreting the metaphor *Lawyers are sharks*, might lead to suppression of shark attributes such as agility in swimming, having fins, and living in the ocean.

We tested both of these hypotheses by asking subjects to read a statement that might be metaphorical such as *Lawyers are sharks*, and then subjects were required to confirm the verity of a statement such as *Sharks are tenacious*. We used as a baseline condition, statements that should be interpreted literally, such as *Hammerheads are sharks*. We found evidence to support the hypothesis that interpreting a metaphor such as *Lawyers are sharks* leads to the enhancement of the attributes that are appropriate to the metaphorical interpretation. For instance, subjects were faster to verify the statement, *Sharks are tenacious* after they read the metaphor, *Lawyers are sharks* than after they read the literal statement, *Hammerheads are sharks*. We also found evidence to support the hypothesis that interpreting a metaphor leads to the suppression of attributes that are inappropriate to the metaphorical interpretation. For instance, after subjects read the metaphor, *Lawyers are sharks*, they were considerably slower to verify the statement, *Sharks are good swimmers*, than after they read the literal statement, *Hammerheads are sharks*. These data suggest that interpreting a metaphor involves both enhancing the attributes that are relevant to the metaphorical interpretation and more intriguingly, suppressing the attributes that are not relevant to the metaphorical interpretation.

We observed identical results when we used nonsensical statements as our baseline. For instance, subjects were faster to verify the statement, *Sharks are tenacious* after they read the metaphor, *Lawyers are sharks* than after they read the nonsensical statement, *Notebooks are sharks*. Conversely, subjects were slower to verify the statement, *Sharks are good swimmers*, after they read the metaphor, *Lawyers are sharks*, than after they read the nonsensical statement, *Notebooks are sharks*. These data again suggest that interpreting a metaphor involves both enhancing the attributes that are relevant to the metaphorical interpretation and suppressing the attributes that are not relevant to the metaphorical interpretation.

Keysar (1994) has also suggested that metaphor interpretation involves suppression. As Keysar points out, the utterance *This place is a prison* can be interpreted literally to refer to an actual jail, or metaphorically to refer to a place that has a very restrictive atmosphere. Keysar proposes that the literal and the metaphorical interpretations are often computed in parallel. If both interpretations are simultaneously activated, and if only one interpretation is intended by the speaker or writer, then again we need a mechanism for attenuating the activation of the inappropriate interpretation. Keysar has suggested such a mechanism under the rubric of 'elimination'. Indeed, Keysar (1994) writes that "the notion of elimination is analogous to the suppression mechanism that Gernsbacher and her colleagues identify as an important mechanism for the skill of reading: the ability to suppress the contextually inappropriate alternative" (1994: 250).

How does the process of elimination, which operates via suppression, work? According to Keysar (1994), selecting between the metaphorical versus literal interpretation of an

utterance depends on the context in which the utterance occurs. Some contexts render certain interpretations more plausible. For example, if the utterance *This place is a prison* occurs in a discourse that suggests that *this place* is very confining and restrictive, then the metaphorical interpretation of *a prison* as a place that restricts freedom becomes more plausible. Hence, what Keysar refers to as a 'plausibility effect' is present and it works to enhance the metaphorical interpretation. Similarly, if the utterance *This place is a prison* occurs in a discourse about wardens and inmates, then the literal interpretation become more plausible. In this way, context facilitates the selection of a metaphorical or literal interpretation. The process of elimination provides a 'negative' force by blocking or suppressing one of the alternatives.

For example, if *this place* is someone's very liberal family household, but nonetheless the utterance *This place is a prison* is claimed by a teenager living in that home, then the metaphorical interpretation becomes more activated – not because the metaphorical interpretation is more plausible, but because the literal interpretation has been suppressed. The referent of *this place* is explicitly stated to not be a jailhouse; it's a family's home. So, in this discourse situation, a literal interpretation is ruled out by the process of elimination. Thus, according to Keysar (1994), context can constrain the selection of both the literal and the metaphorical interpretation, and context does so by plausibility (a positive force) and elimination (a negative force). Elimination works via suppression.

Three experiments support Keysar's hypothesis. The test sentences in these experiments were counterf actuals, such as, *If this place were not a prison, then ...* The test sentences were preceded by contexts that implied the literal interpretation, implied the metaphorical interpretation, eliminated the literal interpretation, or eliminated the metaphorical interpretation. For example, the following scenario implies a literal interpretation: 'The atmosphere there always depended on who was in charge. Sometimes they would leave you on your own, at other times terror would prevail. If this place were not a prison, then … ' In contrast, the following scenario implies a metaphorical interpretation: 'Most of us have white collar jobs. You know, most of the time you're at your desk, working on one or more boring projects. If this place were not a prison, then…'

The eliminate-literal and eliminate-metaphorical scenarios were identical to the plausible-literal and plausible-metaphorical scenarios except that the eliminate-con-texts contained additional information at the beginning of the scenario. For example, the eliminate-literal scenario began 'I just quit my job after working there for 20 years'. And then the eliminate-literal scenario continued on like the plausible-literal scenario, 'The atmosphere there always depended on who was in charge. Sometimes they would leave you on your own, at other times terror would prevail. If this place were not a prison, then …' As another example, the eliminate-metaphorical scenario began, 'You're quite free here; they have a fairly liberal policy. The rules are minimal and not very imposing'. And then the eliminate-metaphorical scenario continued on like the plausible-literal scenario, 'Most of us have white collar jobs. You know, most of the time you're at your desk, working on one or more boring projects. If this place were not a prison, then …'.

In Keysar's (1994) first experiment, subjects read the scenarios and their task was to complete the critical experimental sentence (e.g., 'If this place were not a prison, then …'). After reading all the scenarios, the subjects were told that the sentences could be interpreted metaphorically or literally, and they were asked to indicate which interpretation they had in mind when they wrote their conclusions. The subjects' completions as well as their ratings demonstrated that the contexts biased subjects' interpretations as predicted for both the metaphorical and literal interpretations. Importantly, the additional information that produced the elimination contexts influenced readers to switch their interpretations, suggesting that the readers' interpretation resulted from contextual elimination, or suppression.

Keysar's (1994) second and third experiments investigated the hypothesis that selecting an interpretation by elimination (i.e., suppression) is more effortful than selecting an interpretation by plausibility. This prediction was made for both literal and metaphorical interpretations. Conclusions to the counterfactual sentences were constructed, for example, 'If this place were not a prison, I might be more motivated'. The conclusions fit both the metaphorical and the literal interpretation.

In Keysar's (1994) second experiment, subjects rated how easily they could understand the antecedents (e.g., 'If this place were not a prison') and conclusions (e.g., 'I might be more motivated') of the counterfactual statements. The antecedents were rated as more difficult to understand when they were preceded by the elimination contexts and less difficult to understand when they were preceded by the plausible contexts. The subjects' ratings for the conclusions were similar in all conditions. In Keysar's (1994) third experiment, he measured subjects' reading times for the antecedents and the conclusions. The conclusions took longer to read when they were preceded by the elimination contexts than when they were preceded by the plausible contexts. Subjects' reading times for the antecedents were similar in all four conditions, suggesting that subjects delayed interpretation until the end of the sentence.

Keysar (1994) concluded from all three experiments that an eliminating context can induce either a metaphorical or literal interpretation. Put another way : The role that suppression plays in metaphor interpretation is to suppress the literal interpretation, just as the metaphorical interpretation is often suppressed when a literal interpretation is selected; however, interpretations, both literal and metaphorical, are more difficult to construct by elimination, suggesting that suppression is somewhat attentionally demanding in this case.

3.2. The role of suppression in idiom understanding

Giora and Fein (this volume) have also proposed that suppression plays a role in figurative language comprehension. Like Keysar, they too propose that literal and figurative interpretations of metaphorical, as well as idiomatic, expressions can be activated in parallel; thus, again we need a mechanism for attenuating the activation of the inappropriate interpretation, hence, the role of suppression.

However, Giora and Fein propose some asymmetries in what gets activated and what gets suppressed. Their proposals about activation are based on a 'graded salience' account of figurative language comprehension, according to which salient interpretations are more

activated than less salient interpretations. By 'salient' the authors mean interpretations that are independent of context. Applying the graded salience account to idiom understanding, Giora and Fein (this volume) propose the following: Reading or hearing familiar idioms (e.g., *to kick the bucket*) should lead to both their idiomatic and literal interpretations becoming activated, regardless of the context in which they are read or heard because both interpretations are salient outside of context. In contrast, less familiar idioms (e.g., *to close the book*) are more likely to activate a literal interpretation outside of context; therefore, in a context that biases the literal interpretation (e.g., *After Susan finished reading the chapter, she closed the book*), only the literal interpretation will be activated, but in a context that biases the idiomatic interpretation, both the literal and idiomatic interpretations of less-familiar idioms should be activated.

A series of three experiments tested these predictions. Subjects in these experiments read familiar or less-familiar idioms (in one experiment; metaphors in the other two experiments) and the idioms were presented in contexts that supported either a literal interpretation or an idiomatic interpretation. After reading each idiom, the subjects were presented with two word fragments (e.g., t_b_e, which can be completed as *table*). One word fragment was related to the literal interpretation and the other was related to the idiomatic interpretation. The subjects completed the one word fragment that came to mind first. The dependent variable was the percentage of each type of word fragment correctly completed. For the most part, Giora and Fein's (this volume) predictions were supported.

The graded salience hypothesis predicts which interpretations should be more versus less activated, but not which interpretations should remain activated or be suppressed. To answer that question, Giora and Fein contrast the processing equivalence hypothesis with a 'functional' view of idiom interpretation. According to the processing equivalence hypothesis, the literal interpretation of an idiom presented in a context that biases its idiomatic interpretation should be suppressed, as should the idiomatic interpretation of an idiom presented in a context that biases its literal interpretation.

According to Giora and Fein's (this volume) functional view, the literal interpretation of an idiom is functional for idiom interpretation. Therefore, they predict that with familiar idioms, deriving the literal interpretation does indeed involve suppressing the idiomatic interpretation; however, they propose that deriving the idiomatic interpretation requires retaining the literal interpretation. We await further empirical testing to adjudicate between these two hypotheses.

3.3. The role of suppression in proverb explanation

Lastly, we turn to proverb explanation, and the possible role that the mechanism might play in that type of figurative language comprehension. As Gibbs and Beitel (1995) note, in their insightful and extensive review, proverb explanation is used as a diagnostic tool for evaluating everything from intelligence to psychopathology, language acquisition to personality, brain dysfunction to social norms, to say the least of categorization, abstract thinking, and reasoning skill. Gibbs and Beitel (1995) challenge the view that the failure to provide a figurative explanation of proverbial sayings such as *a bird in the hand is worth two in the bush, don't count your chickens before they hatch, haste makes waste, a stitch in*

time saves nine, too many cooks spoil the broth, many hands make light work, you can't make a silk purse out of a sow's ear, clothes make the man, absence makes the heart grow fonder, out of sight, out of mind, beware of Greeks bearing gifts, don't look a gift horse in the mouth, look before you leap, and *he who hesitates is lost*, reflects a deficit in abstract thinking.

As just one example, we forward here Gibbs and Beitel's (1995) hypothesis for why some schizophrenics are often unable to provide the 'standard' explanation for standard proverbs: "It seems that in at least some patients with schizophrenia the ability to provide figurative interpretations to proverbs is disturbed because they are more easily distracted by associations between words in proverbs and their own personal experiences" (1995: 148). In this way, Gibbs and Beitel (1995) suggest that the ability to explain proverbs might be compromised by the failure to attenuate interference from associations between words and personal experience – in other words, successful proverb explanation might depend on successful suppression, which we have argued plays a fundamental role in comprehension, including comprehension of figurative language.

4. Conclusions

In this paper, we have outlined the crucial role that we propose that suppression plays in many aspects of language comprehension. We define suppression as a general, cognitive mechanism the purpose of which is to attenuate the interference caused by the activation of extraneous, unnecessary, or inappropriate information. We illustrated the crucial role that suppression plays in general comprehension by reviewing numerous experiments that demonstrate that suppression attenuates interference during lexical access (how word meanings are 'accessed'), anaphoric referenee (how referents for anaphors, like pronouns, are computed), cataphoric reference (how concepts that are marked by devices, such as spoken stress, gain a privileged status), syntactic parsing (how grammatical forms of sentences are decoded), and individual differences in (adult) language comprehension skill. We also reviewed research that suggests that suppression plays a crucial role in the understanding of figurative language, in particular, metaphors, idioms, and proverbs. We are optimistic that this approach to language – as driven by general cognitive processes and mechanisms – and this exploration of one of those mechanisms – the suppression of superfluous information – will be fruitful in further exploring language, including figurative language, comprehension.

Biographies

Morton Ann Gernsbacher received her Ph.D. in Experimental Psychology from the University of Texas at Austin. She is currently the Sir Frederic C. Bartlett Professor of Psychology. She has published research on a wide variety of topics in the area of psycholinguistics including sentence processing, narrative comprehension, picture comprehension, suppression of inappropriate information, individual differences in comprehension, text coherence, composition, cataphoric devices, and conceptual anaphora.

Rachel R.W. Robertson received her B.S. in Psychology from the University of Oregon. She is the Director of the Language Comprehension Laboratory at the University of Wisconsin-Madison. Rachel Robertson has published in the areas of sentence processing and narrative comprehension.

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