



word recognition approach could account for the substitutions by claiming that the reader did not look carefully enough at the printed symbols or by saying that the reader confused similar symbols. That is, the reader made mistakes in recognizing or in sounding out these words.

In contrast those theorists working within a psycholinguistic framework would claim that the reader made use of syntactic, semantic, grapho-phonetic, and pragmatic knowledge during the reading. The first substitution is of a verb for a verb, and the second is a noun for a noun. Thus, the reader used syntactic knowledge. The use of syntactic cues is especially evident in the fact that "wants" is properly inflected to agree with the subject. In addition, the reader used semantic knowledge, knowledge that "sun" and "set" frequently cooccur. Finally, the reader used grapho-phonetic knowledge (knowledge of either graphemes or phonemes or a combination of the two) because the expected and observed responses look and sound alike. However, the reader made some incorrect predictions and attended more at times to perceptual cues than to the meaning of the sentence.

Both theories, then, can offer some explanation for (1). But what about (2)? What does a word recognition theory of reading have to say about the substitution of "I" for "he"? There is no graphemic or phonological similarity here. Furthermore, these are short, frequently occurring words that the reader (in this case a sixth-grader) should have been expected to have mastered. In short, the word recognition theory of reading has nothing to say about cases like (2).

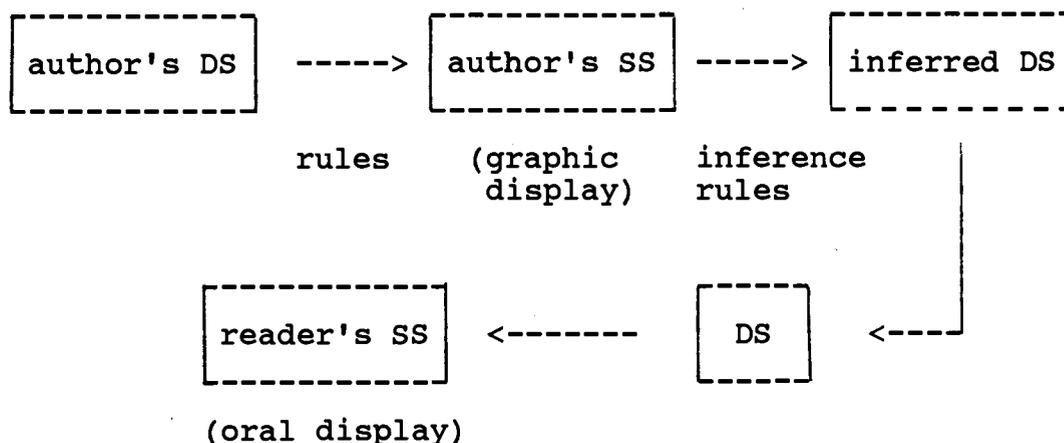
On the other hand, the psycholinguistic theory can offer an explanation. For one thing, the reader used syntactic knowledge at the point of substituting "I" for "he" since both the expected response and the observed response are pronouns in subject position marked for nominative case. The reader's syntactic knowledge enabled him to predict correctly that a nominative pronoun would occur. In addition, since both words here are personal pronouns, there is a semantic similarity between the

expected and observed responses. Furthermore, the reader used pragmatic cues to infer pronoun reference. The pronoun occurs as a dialog carrier, and the reader predicted that the unnamed narrator in this first-person narration would speak these lines. The reader appears to have used the earlier possessive pronoun "my" as a cue for pronoun reference rather than the proper noun "Mr Barnaby". Thus, the reader used syntactic, semantic, and pragmatic cues to make his prediction, and these non-perceptual cues overcame the grapho-phonetic cues in the text. As a result, there was a variation between his observed response and the expected response. Since only the psycholinguistic theory of reading can account for the substitution in the second sentence, it is to be preferred to a word recognition theory of reading.

### 1.1 A Psycholinguistic Theory: The Goodman Model of Reading

Kenneth Goodman has developed a psycholinguistic model of reading. Goodman views reading as a "psycholinguistic guessing game", not as a process of recoding letters to sounds or of recognizing sight words. He schematizes the process of writing and oral reading as shown in Figure 1.

Figure 1. Goodman's Model of Writing and Oral Reading



In this process "The writer encodes thought as language and the reader decodes language to thought." Note that this model

does not assume a recoding from graphic visual input to phonological representation. Goodman argues that readers actively construct texts. Central to Goodman's psycholinguistic model of reading is the notion of "dual texts". The author has a mental text from which certain portions are selected to form the written text. The reader then selects from the written text to create a mental text. Thus, there is both a printed text and the personal text the reader has constructed. There is no direct connection in the diagram between the author's deep structure and the reader's surface structure. This feature of Figure 1 reflects the fact that what the author intended is not necessarily what the reader understood. Although the concept of dual texts as well as the concepts of deep and surface structure are central to Goodman's model of reading, these concepts play no role in word recognition theories. In fact, word recognition theories, in essence, have no articulated theoretical base.

The idea here of dual texts, that there is both a printed text and a mental text the reader constructs, is an important one. Many of the observed responses of readers during oral reading can only be accounted for by considering that there is a difference between what is printed on the page and what the reader has constructed. For example, in (3) the reader's early substitutions help explain the substitution of "he" for "she".

Mr Penny  
(3) Mrs Jones looked up from her sewing.  
he  
"Penny, why are you so excited?" she asked.

In the text the reader constructs, the referent for "she" is "Mr Jones", not the "Mrs Jones" in the printed text. After the substitution of "Mr" for "Mrs", the possessive "her" was also replaced in the reader's text. As this example shows, the substitution of "he" for "she" is a logical consequence of the earlier substitutions. However, without the notion of dual texts, the substitution is difficult to account for.

Goodman's model of reading as a constructive process depends

on viewing reading from a transactional point of view. As Goodman (1983) explains:

In the transactional view, which we take, reader and writer or speaker and listener engage in transactions through text. Similarly we can think of transactions between text and speaker or listener. We prefer Dewey's term, transaction, as interpreted by Louise Rosenblatt (1978) to the term that we and others have used, interaction, because transaction means that each is altered in the process. The text is no longer something external but in fact is something constructed and reconstructed by the reader during reading. Readers in turn are changed during the transactions in terms of their schemata, the conceptual and affective systems whereby they organize experience. In the terms of Dewey and Piaget, knower and known are changed in the process of knowing.

The transactional view differs from a behavioristic approach which focuses on the affect of the text (environment) on the reader and also differs from a cognitive approach which focuses on the affect of the reader (background knowledge) on the text. Goodman comments that in any language episode there are three components: "speaker, listener, and text in oral language and writer, reader, and text in written language. In both cases the language episode occurs in a situational and pragmatic context. One cannot usefully separate any of these from the others or from their contexts for study but each can provide a vantage point from which to study language."

A transactional view of reading is central to a constructivist view of language processing. The concept of dual texts outlined above is an integral component of this transactional approach. Goodman describes the process in some detail.

According to Goodman the reader uses four cyclical processes in order to infer deep structure from the graphic display. These cycles are the optical, perceptual, syntactic, and semantic. Each

plays an important role:

1. Optical --
  - a. Scan in the direction of print display.
  - b. Fix-focus eyes at point in the print.
2. Perceptual --
  - a. Sample-select: choose cues from available graphic display.
  - b. Feature analysis: choose features necessary to choose from alternate letters, words, structures.
  - c. Image formation: form image of what is seen and expected to be seen.
  - d. Compare with expectations.
3. Syntactic --
  - a. Assign internal surface structure.
  - b. Assign deep structure.
4. Construct meaning --
  - a. Decode.
  - b. Assimilate/Accommodate.

Within each cycle there is the possibility of recycling, going back to an earlier stage and trying again. The basic elements of the process within each cycle include sampling, inference, prediction, confirmation (or disconfirmation), correction, and integration. Throughout the process, the efficient and effective reader is making minimum use of available graphemic cues and maximum use of syntactic, semantic, and pragmatic competence.

#### 1.2 Miscue Analysis: The Basis for the Goodman Model

The model of reading outlined in the previous section is based on Goodman's work with miscue analysis. "Miscue" is Goodman's term for a point in oral reading where the expected response (the researcher's expectation based on what is in the printed text) and the observed response (what the reader says) do not match. If there is a match between the expected and observed responses, nothing can be inferred about the process underlying reading. However, when a miscue occurs it is possible to discover

something about the underlying process. Research using miscue analysis has shown how readers rely on their knowledge of the grapho-phonetic, syntactic, semantic, and pragmatic subsystems of the language to construct meaning during reading.

The present study is based on miscue analysis. Readers, according to the psycholinguistic theory, use cues from the grapho-phonetic, syntactic, semantic, and pragmatic systems to construct texts. One component of the pragmatic system is the text cohesion created by, among other things, chains of pronoun reference. Readers assign pronoun reference on the basis of various cues in a text. What these cues are and what strategies readers use to assign pronoun reference is the principal concern of the present research.

## 2.0 Cue Categories

Readers use various cues to make predictions. In the case of pronouns these cues include pragmatic cues as well as semantic, syntactic, and grapho-phonetic cues. Pragmatic cues are those derived from preceding text and from the reader's knowledge of written conventions for representing speech. Evidence that readers use all four types of cues to assign pronoun reference comes from their miscues. The following analysis focuses on miscues on nominative personal pronouns made by four readers of the story "My Brother is a Genius".

Most commonly, reference for nominative personal pronouns is anaphoric, usually to a proper noun, as in the following passage:

0506 Mr Barnaby stopped pacing. "Hummmmm," he said.

However, there are also frequent cases where reference is exophoric, as in the following example:

0226 I don't know about that, but I know we get a good  
0227 education in our school. And they encourage...

Exophoric reference occurs when no explicit antecedent exists in the text. For example, there is no explicit antecedent for either "we" or "they". Readers must use their pragmatic

knowledge to establish a referent for each of these nominative pronouns in the texts the readers construct. This requires readers to make inferences.

In fact, since "My Brother is a Genius" is a first-person narration in which the narrator is never named, the reader must also infer a referent for "I". In addition, readers use their knowledge of oral discourse to assign reference to speakers in dialog. As these examples show, exophoric reference is reference to something outside the text. A third possible type of reference, cataphoric reference, did not occur in the story.

The nominative personal pronouns in "My Brother is a Genius" may be categorized according to the kind of cue available to the reader for assigning reference. The categories are as follows:

1. NP precedes -- the first NP denoting a character or characters (usually a proper noun) which precedes the pronoun serves as its coreferent.
2. PN precedes -- a pronominal, identical in person, number, and gender is the first pronominal to precede the pronoun in question. Narrative and dialog strands of the text are treated separately in determining preceding pronouns.
3. Dialog carrier -- the pronoun serves as a dialog carrier and follows all or part of a direct quotation.
4. Self-reference or direct address in dialog -- the pronoun occurs in dialog and refers to the speaker or hearer.
5. Paragraph-initial "I" -- the pronoun "I" occurs as the first NP referring to a person in a paragraph.
6. High-potential miscue PN -- the pronoun is at a high-potential miscue site if it fails to meet any of the criteria for 1-5.

In the following sections I explain in more detail and give examples of pronouns that qualify for each category.

### 2.1 NP Precedes

In English, the category NP (noun phrase) is used to designate a phrase with a head noun and any modifiers. The NPs that act as referents for pronouns referring to people most commonly

contain proper nouns, such as "Mr Barnaby", as heads, but the head may also be a common noun, such as "brother" in the NP "my baby brother". If an NP used to signal a change in person reference is the first NP that precedes a pronoun with which it is coreferential, that NP should provide a cue for the reader to determine reference. The following is an example of a passage in which an NP establishes the topic and serves as a cue for the following pronoun.

0602 "Our address is 221 Forest Road," I added hurriedly.  
0603 That evening, Mr Barnaby telephoned and then came  
0604 to the house. After he'd talked to...

In this passage there is a shift in person reference from the narrator ("I") to Mr Barnaby. The shift is signalled by the proper noun, "Mr Barnaby", which precedes the pronoun "he". "He" takes its reference from "Mr Barnaby", the immediately preceding NP referring to a person. The paragraph break also indicated a potential change in person reference.

Of the 193 nominative personal pronouns that occur in "My Brother is a Genius" 11 fall into the category "NP precedes". However, it is necessary to define more precisely what constitutes a preceding NP. In the first place, it must be the first NP preceding the pronoun that designates a person. If another NP designating a person intervenes, the reader could predict that the pronoun would refer to it instead. In addition, there may be a maximum distance principle. The data suggests that the NP must be in the same or the preceding sentence.

Secondly, although I include NPs that occur in both subject and object position in the category "NP precedes", I predict, on the basis of the miscues of four readers, that NPs in subject position will generally provide more salient cues for reader predictions than NPs in other positions. There are about an equal number of nouns in subject and object position in the story. However, subject NPs more frequently serve as topics than object-position NPs.

The following is an example of a passage in which an NP in

object position is coreferential with the following pronoun.

0604 After he'd talked to my mother and father  
0605 for a while, they took...

Two of the four readers substituted "he" for "they" in this passage. The substitutions indicate that the readers did not use the object-position NP, "mother and father", as a cue to signal change in person reference. Instead, they continued to infer reference from the preceding pronoun, "he", which refers to Mr Barnaby.

This example suggests that there will be variation within the category "NP precedes". That is, reference will be easier to assign for some pronouns in this category than for others. Nevertheless, pronouns qualify for the category "NP precedes" whether that NP is in subject or object position.

Further evidence that readers use preceding NPs to assign reference comes from the miscue made in the following line.

1013 Andrew's eyes dropped, then closed. <sup>He</sup> I went...

The reader appears to have used the reference to Andrew in the first sentence to predict the pronoun reference in the second sentence. In this case, that prediction was sufficiently strong to cause the reader to ignore perceptual cues since there is no grapho-phonetic similarity between the expected response, "I", and the observed response, "he". In this instance the noun used as a cue to establish person reference is in possessive form within the NP.

In some instances a pronoun intervenes between the pronoun being classified and a preceding NP. This is the case for "he's" in line 0701.

0701 "Mother! Dad!" I yelled, "Andrew isn't typical! He's  
0702 -- he's a genius!"

In this context "he's" in line 0702 is listed under the heading "PN precedes" since, even though the reader has both the preceding pronoun and the preceding proper noun to use as cues for

assigning reference, the preceding pronoun is the closer cue. For this reason, a pronoun is not in the category "NP precedes", even when an NP having the same person and number precedes, if any other pronoun intervenes.

In summary, I categorize a pronoun as "NP precedes" if it agrees in person, number, and gender with the first NP that designates a person preceding the pronoun and if no other pronoun intervenes. The preceding NP may occur in any sentence position and the noun may be marked for possessive.

## 2.2 PN Precedes

A second context which provides readers with pragmatic cues for determining pronoun reference is one in which another pronominal precedes. Generally, once person reference has been established, writers use a series of pronouns to maintain that reference. For that reason, a preceding pronoun should serve as an unambiguous cue for assigning pronoun reference.

However, at least two factors introduce some ambiguity. For one thing writers strive for some variation, and a noun antecedent may be repeated. In addition, in passages with dialog, new pronouns are introduced to refer to speaker and listener.

There are 43 cases of pronouns preceded by other pronominals identical in person, number, and gender in "My Brother is a Genius". These may be further subdivided. There are three types of preceding pronominals that can help readers make correct inferences: preceding nominative pronouns, preceding object pronouns, and preceding possessive adjectives. Thus, in this category, as in the first category, there is variation. In the same way that preceding nouns in nominative position provided stronger cues for readers than nouns in object position, preceding nominative pronouns appear to be more salient cues for establishing reference than preceding object pronouns or preceding possessives.

1. Nominative Pronouns. In some passages there is a series of identical nominative pronouns.

0205 I mean I really yelled it. I guess a fellow...

In passages such as this the first pronoun establishes person reference, and, given no cues to the contrary (such as an intervening NP referring to a person) the reader can use the first pronoun to predict the form of subsequent pronouns.

In some sequences, a pronoun serving as a dialog carrier intervenes between two pronouns with identical reference. For example, in the following lines "I said" comes between the two occurrences of "he".

0510 "How old is he?"

0511 "Eight months," I said. "But he's going on nine."

I consider cases such as the second occurrence of "he" as one in a series of pronouns (PN precedes). Based on the miscues of four readers, I hypothesize that the presence of the preceding "he" will serve as a cue that will enable a reader to correctly predict the second occurrence. Thus, application of the rule for successive identical pronouns is blind to the presence of pronouns acting as dialog carriers. In the same way, a pronoun in dialog may intervene between two pronouns in narrative. Part of the ability readers develop in reading stories is the ability to keep separate the reference in dialog and narrative strands. While both pronouns with an immediately preceding identical pronoun and those which occur in passages where another pronoun intervenes (in dialog or narrative) are put in this category, I predict that readers will miscue more often in the second situation.

An example of such a passage in which pronouns in dialog seem to have led to wrong predictions is the following.

0905 "You!" he said

You

0906 in a sickly whisper. "You!" He stood...

Readers must separate the narrative and dialog strands here to use the "he" in line 0905 as a cue for the reference of the "he"

in 0906. The prominence of the intervening "You!" immediately preceding "he" may have caused this miscue.

Further evidence that readers use preceding pronouns to infer reference comes from miscues such as the following:

I

0811 "I never thought he was typical,"  
0220 ...In a little while he was asleep.  
He  
0221 I went on reading.

In the first example, the reader predicted that the reference for the two pronouns would be the same. In this case, however, the subjects of the main and embedded clauses differ. Nevertheless, the prediction was sufficiently strong to cause the reader to ignore perceptual cues. In this case, the two pronouns occur in the same sentence. Readers may also predict that reference will be maintained across sentences, as in the second example. Here the reader's prediction that the reference will be maintained overwhelms both pragmatic and perceptual cues.

2. Objective Pronouns and Possessives. A reader may also use a preceding object pronoun or a possessive as a cue to predict a subsequent nominative form as in the following sentence.

0516 "We could take moving pictures  
0517 of him when he's at his best."

The change here in person reference from "we" to "he" is signalled by the intervening object pronoun which acts as a cue to enable readers to make correct predictions. It should be added that the change from "we" to "him" causes readers few problems. Readers predict that subject and object position pronouns will typically refer to different people unless the object pronoun is marked for reflexive.

The object pronoun can occur in the same sentence as the pronoun it precedes or in the preceding sentence, as the following example shows.

0605 ...they took him into the bedroom. He leaned...

Here again the change in person reference is signalled by the

object pronoun that intervenes between the nominative forms.

Once again, evidence that readers rely on preceding object pronouns to infer reference of subsequent pronouns comes from reader miscues. The following passage provides several potential cues.

0502 If you have a contest, then all the  
0503 mothers whose babies don't win will be mad at you.  
They...

Here, there are two cues that could lead readers to make wrong predictions -- the subject and the object occurrences of "you" in the first sentence -- and one cue that could lead to a correct prediction, the NP "the mothers whose babies don't win". Readers who substitute "you" for "they" show evidence of using preceding pronouns as pragmatic cues to determine reference.

Another example of a passage in which attention to the object pronoun may have led to the miscue is the following.

0718 At first I just looked at him. "Philosophical?" I asked.  
he

Here, the lack of a paragraph break indicates that no change in person reference will occur. Apparently, the reader ignored that cue and attended to the object pronoun.

In the same way that reference can be inferred from a preceding NP marked for possessive case ("Andrew's eyes"), reference can also be inferred from preceding possessive adjectives, as in the following example:

0103 Part of your education. You just happen...

The cue for the reference for "you" in this line is the preceding occurrence of "your". Even though "your" is traditionally labelled a possessive adjective rather than as a pronoun, it functions as a pragmatic cue for reference in the same way that a pronoun does. For this reason, "you" in line 0103 is classified under the category "PN precedes".

Miscues such as the ones in the preceding passages support the contention that readers use preceding objective pronouns and

possessive adjectives as pragmatic cues to infer reference in the same way they use nominative pronouns to signal a change in person reference. As the miscues also indicate, readers may use commonly occurring pragmatic cues at inappropriate times. Thus, they must learn the limitations of the application of rules they hypothesize on the basis of frequent occurrence of text features and develop strategies that allow them to make successful predictions and inferences.

### 2.3 Dialog Carrier after a Quotation

There are 43 nominative pronouns which serve as dialog carriers following quotations in the story. An example of a conversational exchange in which pronouns serving as dialog carriers designate the speakers is the following.

0328 "I have an idea for a TV program," I said.

0329 "Splendid! Splendid!" he said.

In the first line the unnamed narrator is speaking, and in the second, the speaker is Mr Barnaby, the TV executive. The orthographic cues provided by dialog structure - the quotation marks and paragraph breaks - are sufficient to signal changes in person reference for most readers, who can apply their knowledge of the rules of oral conversation to the written form. Analysis of the miscues of four readers shows few miscues on dialog carriers.

The only limitation on dialog-carrier pronouns is that they follow all or part of a quotation. In the following example "she" causes miscues despite being a dialog carrier.

0317 Mr Barnaby was a very busy man. As the lady led me

0318 toward his office, she said, "Mr Barnaby is..."

There are few cases in "My Brother is a Genius" such as this one where the dialog-carrying pronoun precedes the quotation. If the dialog carrier precedes the quotation, the orthographic cues, the quotation marks and paragraph break, are not present as cues for the reader to predict that the upcoming pronoun is a dialog carrier. The previous example, in fact, is interesting because it presents conflicting cues. "She" is a dialog carrier preceded by

an NP ("the lady"), which should lead readers to correct predictions. However, both before and immediately following the pronoun, another NP, "Mr Barnaby", occurs. This NP may have greater force because it is explicitly a name. In addition, the possessive adjective "his" could lead readers to predict reference of the following pronoun. Finally, this story has only two female characters, and "she said" occurs only twice in the entire story, so readers may predict "he" on the basis of frequency.

As this example shows, readers may be presented with a number of potential cues for determining pronoun reference. Not all pronouns listed under the category "Dialog carrier" provide equally unambiguous reference cues. One sentence on which a reader miscued on a dialog carrier, repeated here, presents potentially conflicting cues.

0718 At first I just looked at him. "Philosophical?" I asked. <sup>he</sup>

In this sentence the presence of the preceding object pronoun appears to have been more a salient cue than the dialog carrier position. However, there was no paragraph break in this case. In addition, the word "philosophical", which caused miscues for all four readers, might either have served to distract the reader from the orthographic, dialog cues, or the word might not have been recognized as constituting quoted speech. In this case, then, even though the pronoun "I" serves as a dialog carrier, some readers may not recognize it as a dialog carrier and may base their inferences on other cues. In addition, some readers may have a general problem in recognizing or reading dialog.

Despite exceptions such as this, the four readers made few miscues on pronouns serving as dialog carriers, so this text position must provide important pragmatic cohesion cues for determining pronoun reference.

#### 2.4 Self-Reference and Direct Address in Dialog

Pronouns with exophoric reference frequently occur in directly quoted speech as well as in dialog-carrier position.

During dialog, characters often use pronouns to refer to themselves or to address others. There are 37 cases of self-reference and direct address that occur in "My Brother is a Genius". The most conventional way for speakers to refer to themselves is to use "I", and the most conventional way for speakers to address hearers is with the pronoun "you". Readers use this convention to predict that characters will use these forms in directly quoted speech.

For the four readers of "My Brother is a Genius", there was only one instance in which a miscue occurred on "I" or "you" in dialog. It occurred in the following passage.

I I  
0525 He placed a hand on my shoulder. "You know," he  
0526 said. "I think you may have hit on a gold mine, my boy."

This example is rather complex. The reader may have attended to the "I" substituted for "he" and predicted that the following pronoun would maintain that reference. This prediction of first-person reference is reinforced by the possessive "my". On the other hand, the reader may have made the miscue because he predicted that the speaker would refer to himself rather than address the hearer. In addition, "you" is used here in the idiomatic expression "You know". Any of these factors could have caused the miscue. Nevertheless, this was the only miscue any of the four readers made on "you" or "I" used for direct address or self-reference in dialog, so this text position must offer strong pragmatic cues for readers to determine pronoun reference.

This example raises an important point. One miscue may lead to other miscues. The locus of reference for a pronoun exists in the text that a reader constructs, not in the printed text. If a reader constructs a text that differs from the printed text, he or she may make inferences and predictions not predictable solely on the basis of an analysis of a printed text. A miscue is evidence that the text the reader is constructing may differ from the printed text. Any analysis of reader performance should consider all the miscues the reader makes on a particular passage.

A good example of how earlier miscues in a passage can help account for subsequent miscues is the following:

1008 I opened it to the S's. "Andrew, listen  
                                  he                                  he  
1009 to this," I said as calmly as I could.

An analysis based solely on text features would not predict either substitution of "he" for "I". The "I" operating as a dialog carrier would not be predicted to cause miscues for two reasons. First, it is a dialog carrier, and second, it follows another nominative "I". Thus, the reader has two pragmatic cues to base an inference on that there will be no change of person reference here. The final "I" in the sentence should not cause a miscue either since it is one of a series of identical pronouns.

However, these pronoun substitutions are easier to account for when all the miscues the reader made on the passage are taken into account. One reader restructured this sentence and read it as follows:

1008 I opened it to the S's section. Andrew listened  
1009 to this. He was as calm as he could.

The substitutions of "he" for "I" can easily be explained using the principles developed above once all the miscues are considered. The first "he" agrees with the preceding NP "Andrew" and the second NP follows in the sequence of similarly marked nominatives. This example provides evidence that at times some readers, as they attend to selected cues, construct texts that are syntactically and semantically acceptable even though they vary considerably from the printed text.

The four readers whose reading I analyzed seldom made miscues on the pronouns "I" or "you" used during the dialog to refer to the speakers or hearer, but they made miscues frequently in passages when speakers used "we" to refer to themselves or hearers during conversation. For example, one of the readers substituted "I" for "we" in the following passage.

                                  I  
0516 "Sure," I said. "We could take some moving pictures

"We" is less predictable than "I" or "you" because it occurs less often. Sometimes "we" represents a special register that readers may not be familiar with. Furthermore, "we" may not have an explicit coreferent.

In the previous example, the pronoun substituted was identical to the preceding pronoun, and the reader may have attended to that pronoun as a cue. However, there are also cases where the preceding pronoun is not identical to the pronoun substituted. For example, in the following passage where "I" was also substituted for "we", the preceding pronoun is "he".

0413 ...He walked around the office

I

0414 thinking. "Yes. We could have a contest..."

In this case the speaker is the TV executive, Mr Barnaby, and the reader infers that he will put on the contest. In fact, Mr Barnaby's "we" here has no explicit coreferent since the reference is not to the narrator and Mr Barnaby. Since there is no grapho-phonetic similarity between the expected response "we" and the observed response "I", this is again a case where the reader's prediction overwhelmed perceptual cues. This example shows that readers expect speakers to use "I" or "you", not "we".

A third example in which a reader substituted "I" for "we" in dialog occurred in the following passage.

0215 ...Andrew

0216 stopped crying and tried to take hold of the dictionary.

I

0217 "Let's see what we can find in the S's," I said.

In the story Andrew is an eight-month old baby, and the narrator reads words to him from the dictionary. In this passage, the narrator uses "we", but, in fact, only one person does the looking, so the miscue reflects that reality. An analysis of the printed text would suggest that "Let's" provides a cue for the following "we" in the form of the contracted objective first person plural pronoun. However, "us" is apparently not the antecedent in the text this reader constructed. Readers infer

of a paragraph, but as the previous example demonstrates, this is not necessarily the case. In addition, this category does not include "I" in dialog used as self-reference or "I" used as a dialog carrier.

There are two reasons that readers of this story could be expected to correctly infer the reference of paragraph-initial "I". In the first place, readers are given the paragraph break as a cue, and paragraph breaks generally signal a change in speaker. These formatting cues should override cues such as the noun and pronoun in the preceding paragraph. As was the case with the other cue categories, readers are presented with more potentially conflicting cues at sites such as this than at other sites. Nevertheless, the four readers made comparatively few miscues on instances of paragraph-initial "I".

A second reason that readers could be expected to make correct predictions in the context of a paragraph-initial "I" is that this story is a first person narration, so "I" is a sort of default value. That is, if there are no other cues to suggest the reference of a pronoun, readers can predict "I" in a first person narration.

A second clear example of paragraph-initial "I" occurs later in the story in lines 0813-0901.

0813 At the station Mr Barnaby rushed us into the studio and  
0814 pushed a crib for Andrew under one of the big cameras.  
0815 There were glaring spotlights and floodlights and cables  
0816 rigged up everywhere. There was a glassed-in part along  
0817 one whole side of the studio -- the control room. There  
0818 two men were signalling to each other, and one was pointing  
0819 to the clock.  
0901 I still thought...

In the first paragraph several characters are mentioned, but no clear cues are provided for the subsequent "I". Again, the paragraph break signals the shift to a new reference, and the four readers correctly predicted the first person singular form.

of a paragraph, but as the previous example demonstrates, this is not necessarily the case. In addition, this category does not include "I" in dialog used as self-reference or "I" used as a dialog carrier.

There are two reasons that readers of this story could be expected to correctly infer the reference of paragraph-initial "I". In the first place, readers are given the paragraph break as a cue, and paragraph breaks generally signal a change in speaker. These formatting cues should override cues such as the noun and pronoun in the preceding paragraph. As was the case with the other cue categories, readers are presented with more potentially conflicting cues at sites such as this than at other sites. Nevertheless, the four readers made comparatively few miscues on instances of paragraph-initial "I".

A second reason that readers could be expected to make correct predictions in the context of a paragraph-initial "I" is that this story is a first person narration, so "I" is a sort of default value. That is, if there are no other cues to suggest the reference of a pronoun, readers can predict "I" in a first person narration.

A second clear example of paragraph-initial "I" occurs later in the story in lines 0813-0901.

0813 At the station Mr Barnaby rushed us into the studio and  
0814 pushed a crib for Andrew under one of the big cameras.  
0815 There were glaring spotlights and floodlights and cables  
0816 rigged up everywhere. There was a glassed-in part along  
0817 one whole side of the studio -- the control room. There  
0818 two men were signalling to each other, and one was pointing  
0819 to the clock.  
0901 I still thought...

In the first paragraph several characters are mentioned, but no clear cues are provided for the subsequent "I". Again, the paragraph break signals the shift to a new reference, and the four readers correctly predicted the first person singular form.

## 2.6 Summary of Pragmatic Cohesion Cues

A total of 193 nominative personal pronouns occur in "My Brother is a Genius". Each pronoun may be categorized under one of six categories. Pronouns in each of the first five categories described above occur in contexts where cues are available to help readers make accurate inferences about pronoun reference. Within each of these five categories there is variability since some contexts provide conflicting cues, and readers must develop strategies to determine which cues to attend to. In addition, the miscue frequency of the four readers suggests that some categories more consistently provide cues to which readers attend than do other categories. Pronouns that fall into one of these five categories might be labelled low-potential miscue sites because of the available cues.

Some pronouns occur in passages where the indentified cues are not available. I hypothesize that readers will make miscues most frequently at these sites. Again, not all of these high-potential miscue sites are equally ambiguous. If the site is preceded by a noun or pronoun which does not agree in person, number, or gender with the pronoun in question, readers are faced with both a lack of helpful cues and also with potentially misleading cues. In these cases readers may have the most difficulty in determining pronoun reference.

In the following sections I use these categories to analyze in more detail the miscues made by four readers of "My Brother is a Genius". By identifying the sites where pronoun miscues are apt to occur, I am able to analyze a reader's performance on a particular text by comparing the number of pronoun miscues he or she makes at these sites with the number possible. Of course, the reader may also make pronoun miscues at other sites for various reasons. Analysis of these miscues could suggest additional categories of miscue types. Further, some pronoun miscues could result from other miscues that occur in the surrounding text.

### 3.0 Pronoun Miscues by Four Readers of "My Brother is a Genius"

The analysis of the pronoun miscues of four sixth graders reading "My Brother is a Genius" reveals marked differences in their individual performances. The two readers who made the most total miscues in reading the story made 43 of the 48 pronoun miscues. The reader who made the fewest total miscues in his reading had only one pronoun miscue. This suggests that readers' ability to use pragmatic cues to infer pronoun reference is correlated with general reading ability.

Even though the focus in the following sections is on reader miscues, it is important to point out that even the reader who made the most total miscues got pronouns right 87.6% of the time. In fact, the four readers made correct inferences about pronoun reference about 94% of the time. If pronoun miscues related to prior miscues are subtracted, this figure is even higher.

An analysis of individual performance is revealing because it suggests that certain kinds of pragmatic cues are more useful than others in inferring reference. That is, it is possible to establish a tentative hierarchy of pragmatic cues ranging from weakest to strongest on the basis of the data.

Further, a close examination of points in the text where individual readers made miscues on pronouns suggests that some of these are actually "good miscues" caused by misleading writing. By misleading writing (or editing in the case of basal readers) I mean text in which cues that normally lead to successful prediction of pronoun reference instead lead to wrong predictions. For example, if there is a passage in which a proper noun precedes a nominative pronoun which is not coreferential with that noun, the reader may still use the noun as a cue for reference and make a miscue. This is a good miscue in the sense that the reader is using an appropriate strategy. A careful examination of a text can reveal the extent to which it contains these kinds of passages.



categories as follows:

NP precedes	- 1	Self-ref or Dir. Add.	- 0
PN precedes	- 3	Paragraph-initial "I"	- 0
Dialog marker	- 1	High-potential site	- 16

There are 44 high-potential miscue sites in the story, and David made miscues at 16 of these sites. This represents a 36% rate. Among the miscues at high-potential sites, 6 were substitutions for "we" used for self-reference or direct address in dialog. Since there were only 7 of these miscue sites in the story, it is apparent that David makes especially strong predictions for this context.

On the other hand, at the low-potential sites, David made miscues only 5 times among 149 sites, or 3% of the time. He miscued most frequently at sites where a preceding pronoun served as the pragmatic cue. In two of these cases, the preceding pronoun is separated from the miscue site by dialog, so conflicting cues are present. An example is the following passage:

0520 "But what if he cries or something?" I asked.  
0521 "All babies cry," said Mr Barnaby. "He wouldn't..."

The preceding pronoun is separated from the miscue site by "I" used as a dialog carrier as well as two NPs that refer to persons. Therefore, the cue is considerably weakened.

### 3.2 Peter's Miscues

Peter substituted one nominative personal pronoun form for another 19 times during his reading. Three of these miscues appear to have been caused by prior miscues in the passage. The remaining 16 miscues are distributed among the categories as follows.

NP precedes	- 1	Self-ref and Dir. Add.	- 0
PN precedes	- 1	Paragraph-initial "I"	- 1
Dialog marker	- 4	High-potential site	- 9

Over half the miscues occurred at high-potential sites. Peter's 9 miscues at 44 sites represents a 20% miscue rate. On the other hand, at the low-potential sites, Peter made miscues 7

times among the 149 sites for a 4.6% miscue rate. Even though Peter made a great number of miscues in reading this story, he read 95% of the pronouns at low-potential sites correctly. Among these sites, the category where most of the miscues occurred was "Dialog marker". His four miscues in this category suggest he may have some difficulty recognizing or reading dialog.

### 3.3 Miscues made by Dorothy and Henry

The two other readers of "My Brother is a Genius" whose reading I have analyzed made far fewer miscues generally and far fewer pronoun miscues. This further suggests that the ability to use pragmatic cues may be correlated with overall reading ability.

Dorothy made only 3 miscues that involved the substitution of one nominative personal pronoun for another. One was at a high-potential miscue site. The other two were in the categories "PN precedes" and "Dialog marker". Henry's only miscue on a nominative personal pronoun occurred on a dialog carrier.

### 3.4 A Tentative Hierarchy of Pragmatic Cues

The combined results for the four readers suggest that for this story certain categories among the low-potential miscue sites provide stronger cues than other categories. Table 1 summarizes the miscues by category.

Table 1. A Summary of the Miscues of 4 Readers of "My Brother is a Genius" by Category

Category Name	Total Sites	Total Miscues	Miscues per Site	Miscues per Reader
NP precedes	11	2	.18	.045
PN precedes	43	5	.12	.029
Dialog marker	43	7	.16	.040
Self-ref, D.A.	37	0	0	0
Para-init "I"	15	1	.07	.017

These results are based on limited data. However, they suggest that for these readers, the most helpful cues were self-reference or direct address in dialog and the least helpful were preceding NPs and the dialog marker position. Thus, the hierarchy of cues from strongest to weakest is:

1. Self-reference or direct address in dialog
2. Paragraph-initial "I"
3. PN precedes
4. Dialog marker
5. NP precedes

Miscues at these low-potential sites were much less frequent than miscues at high-potential sites. These four readers made a total of 26 miscues at the 44 high-potential sites for a 59% rate. On the other hand, at the 149 low-potential sites, the readers made 15 miscues for a 10% rate. These results suggest that readers do make use of pragmatic cues to infer pronoun reference and that different kinds of cues differ in their usefulness for readers.

#### 4.0 Application of the Analysis to the Full Data Pool

In the preceding sections, I outlined a method for analyzing substitution miscues involving nominative personal pronouns. Using this method, I categorized pronouns as occurring in one of a variety of contexts which might or might not lead readers to make correct inferences about pronoun reference. In particular, I identified a number of pronouns that occurred at sites where pragmatic cues for inferring reference were lacking. I called these high-potential miscue sites since I hypothesized that readers would make miscues more often at these sites than at other sites.

The preliminary analysis in the preceding sections was based on the miscues of 4 readers. In this section I consider the miscues made by all 32 readers of "My Brother is a Genius". The data is drawn from a study carried out by Goodman and Goodman (1978). Eight populations are included in that study: four

second-language groups and four dialect groups. The second-language groups are Navajo, Hawaiian Samoan, Arab, and Texas Spanish. The four dialect groups are Downeast Maine, Appalachian White, Mississippi Rural Black, and Hawaiian Pidgin. These are stable dialect groups. The children are at least second-generation inhabitants of the area. The children selected for the study were rated by their teachers as average readers for their grades and for their schools. Goodman and Goodman's study showed that second-language and dialect readers make the same kinds of miscues as speakers of standard English.

#### 4.1 Results of the Analysis

For the 193 nominative personal pronouns in "My Brother is a Genius" readers made a total of 192 substitution miscues where the observed response was also a nominative personal pronoun. Of the 193 pronouns, 44 are identified as occurring at high-potential miscue sites. Readers substituted a different nominative personal pronoun at one of these sites 112 times. In other words, on the average, 2.5 readers made pronoun-for-pronoun miscues on each of the high-potential miscue sites.

This figure of 2.5 miscues per site is well above the average for the sample. In fact, there were only 80 miscues for the 149 pronouns identified as occurring at low-potential miscue sites, an average of .5 miscues per site. The only category among these low-potential sites for which there were more miscues than sites was "NP precedes", for which there were 13 miscues at 11 sites. This is still an average of only 1.2 miscues per site, less than half of what occurred at the high-potential miscue sites. Thus, for "My Brother is a Genius" the predictions for high-potential miscue sites are supported by the data.

#### 4.2 Conclusions and Educational Implications

The results from the full data pool support the claim that readers use cues to assign pronoun reference. Reading pronouns must not be a word-by-word process. If it were, readers would be

expected to make relatively similar numbers of miscues on pronouns in each category. The fact that readers make so many more miscues at high-potential sites, sites where cues are absent or where there are misleading cues, lends strong support for the psycholinguistic theory of reading which holds that readers assign pronoun reference by using pragmatic cues.

The method of analyzing texts described here is applicable to any text. If a printed text has a large number of high-potential miscue sites, readers may occasionally have trouble constructing cohesive mental texts. This will depend in part on the degree to which readers have developed successful strategies for dealing with degrees of pronoun reference ambiguity. Thus, being able to determine whether or not a particular text contains a number of high-potential miscue sites has certain practical applications. Furthermore, if teachers understand the theoretical basis of the approach to reading underlying the analysis, they can develop an understanding of how students assign pronoun reference. This could help teachers to see that the miscues students make in oral reading are often a sign of a gradually developing control of reading strategies rather than a weakness.

In addition, rather than assuming that students are too young to read a particular text or that they lack the necessary reading readiness skills, a teacher could use the method described here to look at how the pronouns in a text are distributed among cue categories and how those categories are realized. Certain texts quite simply may lack the cohesion that less experienced readers require. Providing such readers with opportunities to read more cohesive texts would seem to be an appropriate instructional strategy. Further, teachers could use the kinds of strategy lessons developed by Goodman and Burke (1980) with those students who make miscues reflecting use of inappropriate strategies. These lessons are particularly helpful because they engage students in interesting reading rather than giving them skill-sheets or other meaningless activities.

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