*The acquisition of word meaning from context by children of high and low ability**

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THE PROCESS of acquiring word meaning from context was investigated for high- and low-ability children. Fifth-grade children were given a task that tested their ability to derive the meaning of an unknown word from a sequence of contexts and to use the newly learned word in subsequent contexts. Significant differences were found in favor of the high-ability group. Qualitative comparisons revealed differences in the types of errors made by each group and differential difficulty within certain aspects of the task. Findings demonstrate characteristics of processing that differentiate successful and less successful meaning acquisition and underscore the complexity of the meaning-acquisition process.

L'acquisition du sens des mots à partir d'un contexte chez des enfants de compétence supérieure et inférieure

ON A ÉTUDIÉ le procédé d'acquisition du sens des mots à partir d'un contexte chez des enfants de compétence supérieure et inférieure. On a donné à des élèves de septième un travail qui testait leur capacité de puiser le sens d'un mot inconnu à partir d'une séquence de contextes et d'utiliser ce mot nouvellement acquis dans des contextes subséquents. On a trouvé des différences significatives en faveur du groupe à haute capacité. Des comparaisons qualitatives ont révélé des différences dans les genres d'erreurs faites par chaque groupe et la difficulté différentielle dans certains aspects du travail. Les découvertes expliquent des caractéristiques de développemement qui différencient l'acquisition heureuse et moins heureuse du sens et soulignent la complexité du procédé d'acquisition de sens.

La adquisición del significado de palabras del contexto en niños de alta y baja habilidad

SE INVESTIGÓ el proceso de adquirir el significado de palabras del contexto en niños de alta y baja habilidad. Niños de quinto grado recibieron una tarea para probar su habilidad para derivar el significado de una palabra desconocida de una sequencia de contextos y a utilizar la palabra recién aprendida en contextos subsiguientes. Se encontraron diferencias significativas a favor del grupo de alta habilidad. Al hacer comparaciones cualitativas se encontraron diferencias en los tipos de errores que cometió cada grupo y diferencias en el grado de dificultad en ciertos aspectos de la tarea. Los resultados demuestran características de proceso que diferencian a aquellos que son exitosos en adquirir el significado y los que son menos exitosos y subrayan la complejidad del proceso de adquirir significado.

Research on vocabulary, which can be described as research that bears either directly or indirectly on the improvement of vocabulary knowledge, has a history dating back at least to Thorndike's work in 1917 (Clifford, 1978). Major trends in vocabulary research have included investigations of the relationship between vocabulary knowledge and reading comprehension, the role of context in acquiring word meaning, and the effectiveness of vocabulary instruction. The accumulation of research has shown that fundamental assumptions underlying each of these trends is highly conditional. That is, the notions that vocabulary knowledge

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and reading comprehension are related, that context promotes vocabulary learning, and that instruction brings about vocabulary knowledge have been borne out by research, but only under certain conditions.

A current focus of vocabulary research is the investigation of the conditions within which these notions about vocabulary knowledge operate, and what brings about those conditions (see for example, Carnine, Kameenui, & Coyle, 1984; Freebody & Anderson, 1981a, 1981b; Jenkins, Stein, & Wysocki, 1984; Nagy, Herman, & Anderson, 1985; Sternberg, Powell, & Kaye, 1983). This orientation demonstrates a consideration of cognitive functions that underlie and enable vocabulary learning. Concern with cognitive issues has been reflected in several studies of the effectiveness of vocabulary instruction. Consideration of underlying cognitive processes has been demonstrated implicitly, in the design of the instruction (Draper & Moeller, 1971), explicitly, in the rationale and methodology as well as the instructional design (Beck, Perfetti, & McKeown, 1982; Gipe, 1978-1979; Kameenui, Carnine, & Freschi, 1982; Margosein, Pascarella, & Pflaum, 1982; McKeown, Beck, Omanson, & Perfetti, 1983), and in the discussion of factors contributing to certain results (Jenkins, Pany, & Schreck, 1978; Pany & Jenkins, 1978).

In addition to considering the functioning of cognitive processes in the design of vocabulary instructional studies, processing issues can also be investigated more directly by exploring how learners handle information in vocabulary learning and vocabulary application situations. Such an approach was taken, through investigations of acquiring word meaning from context, in Werner and Kaplan's (1952) classic developmental study and in a recent study by van Daalen-Kapteijns and Elshout-Mohr (1981).

Werner and Kaplan's study sought to describe the various ways children use language in deriving word meaning and the developmental effects on the use of language. In doing so, they focused on problematic aspects of children's use of context by using a purposely abstract, difficult task. The purpose of their study was to discover at what point in the process, and to which behaviors, children regressed when given such a difficult task. To gain an appreciation of the nature of the task, consider the following sentences which children were to use to derive the meaning of the artificial word *hudray* which was given the meaning of "to grow, increase, or expand":

1. You hudray what you know by reading and studying.
2. Mrs. Smith wanted to hudray her family.
3. To hudray the number of children in the class there must be enough chairs.

The study by van Daalen-Kapteijns and Elshout-Mohr (1981) sought characteristics of an efficient process of word-meaning acquisition by studying the responses of (relatively) high- and low-ability college students to a word-meaning acquisition task. The investigators found that both high- and low-ability groups formed a rough notion, or model, of an unknown word's meaning from initial contexts, but the groups worked to refine the models in different ways. The high subjects were able to maintain a certain invariance of meaning among different contexts, yet remain flexible enough to revise the word meaning as needed. Low subjects, on the other hand, tended to readjust the entire model or develop a new one to take its place.

The study reported here is closely related to those of Werner and Kaplan and van Daalen-Kapteijns and Elshout-Mohr in that it was undertaken to investigate differences in the process of acquiring word meaning from context in learners at different levels. The present study differs from the earlier studies in three ways. First, the task presented to children in the present study differs from that presented in Werner and Kaplan's study in that it was designed to be more at the level of contexts children typically encounter in school reading. The task was designed to yield a description of where difficulties in the process of acquiring word meaning from context ordinarily occur.

Second, the present study extended the investigation of word-meaning acquisition by ad-

dressing the question of how well an "acquired" word can be applied in later encounters.

Third, the present study differs from those of Werner and Kaplan and van Daalen-Kapteijns and Elshout-Mohr in that it has as a major goal the consideration of instructional issues.

METHOD

Materials

The materials used in this study consisted of an experimenter-created meaning-acquisition task containing six items, each designed around an artificial word. Each item consisted of a sequence of sentences containing an artificial word and clues to the word's meaning. The artificial words represented two nouns, two verbs, and two adjectives. The task was based on a hypothesized view of an effective process of acquiring word meaning from context, which is presented in the next section.

A View of the Meaning-Acquisition Process

The present view of the meaning-acquisition process was developed to serve as a basis for creating a meaning-acquisition task. The process has as its goal the discovery of a stable meaning for an unfamiliar word that makes sense in, and illuminates the meaning of, the contexts in which the word appears. This view does not necessarily cover all instances of learning words from context.

The hypothesized process begins when a person recognizes a word within a context as unknown and *selects* from the context concepts that constrain the meaning of the word. Then he or she *searches for* and *tests* meaning candidates within the context. Meaning candidates are defined as known concepts that seem to fit the constraints selected. Candidates are tested by matching the contextual constraints with the features of the candidate concept. A hypothesis about the word is then formed. If decision criteria are not reached (i.e., if the hypothesis formed does not include a decision that the word is now known), the process continues with the next encounter of the word in context.

With a subsequent encounter, the learner again selects constraints and searches for and tests meaning candidates. But between the selection and the search is another step, that of *coordinating* the constraints of the present context and prior context(s). In this way, information about the word's meaning is *compiled* and *refined* until the hypothesis formed about the word meets the decision criteria.

The Meaning-Acquisition Task

In this section, a description of the task and its relationship to the hypothesized meaning-acquisition process is provided. The stimulus material from one of the six items developed for the task is presented in Table 1. This item was developed around the artificial word *narp*, whose designated meaning was *ordinary*. The task took the child through a series of contexts containing an artificial word which eventually directed him or her to a designated meaning for the word. Each item in the task comprised five steps, which are described below.

Step 1. A context sentence containing an artificial word was read to the child and six choices for the word's meaning were presented, one at a time. Children were asked if each choice could be the meaning of the word and why or why not. The six choices were selected so that two of them could be rejected with reference to the context immediately around the word, or the "local" context. For *narp*, the local context was *house*. One of the six choices fit at the local context level but not at the fuller, or more "global," context level. The other three choices were permissible choices for the new word's meaning.

This first step represents two aspects of the view of the word-meaning acquisition process described earlier. First, the justifications that the children gave for their choices provided evidence of the contextual information used to select meaning constraints. Second, the children's evaluation of each choice as appropriate or inappropriate and their justification of choices reflected the testing of meaning candidates within the constraints chosen.

Table 1 Sample item from meaning-acquisition task

Step 1	Standing in front of it we all agreed that it seemed like a narp house.	
Choices		acceptable in sentences:
	expensive	1, 2a
	strange	1, 2a, 2b
	brick	local context of 1
	shy	2b
	ordinary	all sentences
	soft	none
Step 2	a) It was hard finding the right gift because everything in the store was so narp. b) When he's around older people, Henry acts narp.	
Step 3	a) It looked like a narp house, right at the corner near the bus stop. b) It looked like a narp house, and most people never thought much about it. c) It looked like a narp house, like all the others on the block.	
Step 4	On every narp weekday, the children went to school and their parents went to work.	
Step 5	Good sentences	Bad sentences
	a) A narp clock has two hands.	a) Someone who has magic powers is narp.
	b) Eating lunch is a narp thing to do.	b) People dress up and look narp on Halloween.
	c) It's narp to wear boots in winter weather.	c) Other people stay away from narp guys.

Step 2. Two additional sentences containing the same artificial word as in Step 1 were presented together. The child was told to use information from both sentences to decide if each of the six choices fit the meaning of the word and why or why not. The first sentence presented allowed the same three choices as the sentence in Step 1, and the other allowed two of those choices and one choice that was disallowed for the initial sentence. Thus, the child was, ideally, able to accept two choices as possible meanings at this point. This step reflects the coordination of two contexts to select constraints and the testing of candidates within the coordinated constraints in the present view of the word-meaning acquisition process.

Step 3. Three sentences were presented based on one of the sentences shown earlier, but different detail had been added in each case. After each sentence, the child was asked if it told any more about the meaning of the word, and if so, what. In this step, one sentence contained no additional information that distinguished the meaning choices and the other two gave clues that allowed a final choice to be determined. This step reflects the view of the word-meaning acquisition process in that information about meaning is compiled and refined.

Step 4. At the end of Step 3, the child was asked what he or she thought the meaning of the word was. An additional sentence was presented only if the child was incorrect or still unsure of the meaning. The sentence for Step 4 consisted of a strong context that gave explicit clues to the meaning of the word. The child was then asked if he or she knew anything more about the word's meaning. If still unsure, the child was told the correct meaning. Step 4 reflects the aspect of the word-meaning acquisition process in which a decision is made as to a word's meaning.

Step 5. Six sentences were presented and the child was asked, for each, if it was a "good" sentence, that is, true, or a "bad" sentence, because it was not true. This step was designed so that three sentences were good and three bad, regarding their use of the artificial word. This step corresponds to what can be described as the goal of the meaning-acquisition process. That is, it tests if the child, having reached decision criteria about the word (or having been told its meaning), can use the knowledge of the word's meaning to interpret the meaning of new sentence contexts.

Subjects and Design

The subjects in this study were 30 fifth-grade children from a small, urban school district in western Pennsylvania. High and low vocabulary ability groups were formed with 15 children in each group. Criteria for the groups were set after examining scores obtained by all the children at the end of their fourth-grade year on the Vocabulary subtest of the Stanford Achievement Test (Madden, Gardner, Rudman, Karlsen, & Merwin, 1973). Children whose vocabulary scores fell in the middle of the distribution (this turned out to be grade equivalent scores from 4.2 to 4.7) were eliminated from consideration as potential subjects.

The high-ability group was formed with all fifth-grade children for whom scores could be obtained who had achieved a grade level equivalent score of 4.8 or above. These scores represent high ability for this population of children, although scores beginning at this level are average in terms of national norms. The mean vocabulary score of the high group was 5.8.

The low-ability group was formed with all fifth-grade children for whom scores could be obtained who had achieved a grade level equivalent of 4.1 or below, and who had scored 3.3 or above on the Reading subtest of the Stanford Achievement Test. This second criterion was added in an attempt to eliminate children whose ability was so low as to signal possible problems with understanding the task requirements. The mean vocabulary score of the low group was 3.2.

The Reading subtest scores for the Stanford Achievement Test were also calculated for each group. The high group's mean on the reading test was 5.8, the same as for the vocabulary test. The low group's mean on the reading test was 4.4, considerably higher than their vocabulary test mean.

Procedure

The task was administered by the experimenter individually to each child. The items were presented on index cards and read aloud to the child. The task was presented in 2 three-item sessions. Responses were tape recorded and later transcribed for scoring.

The items and choices within each item were presented in a fixed order. This decision was made because order effects did not seem a risk here, because items were not being compared with each other. The interest was individual differences, which might artificially vary more if order of items or choices varied.

Scoring

Seven scores, two each for Steps 1 and 2 and one each for Steps 3, 4, and 5, were obtained. The seven scores were summed across items. Reliability of the scoring system was determined by having a second judge score 20% of the data which consisted of the responses to all six items by three children from each group, selected randomly from within each group. The reliability, which was determined by the match between the two evaluations of each response, was .95.

Step 1 was scored for the two aspects of meaning acquisition that it reflected: the selection of constraints and the testing of candidates within constraints. For *constraint selection*, each choice within each item was worth 2 points, which were awarded if a child's reason for accepting or rejecting a choice was correct and sufficient (i.e., reflected consideration of local and, when needed, global context, to reach a conclusion). One point was awarded if a constraint was chosen that was correct, but not sufficient (e.g., when a choice was correctly accepted, but only local context had been considered).

The *testing of constraints* was worth 1 point for each choice. The point was awarded if the child correctly evaluated the choice, given that some correct constraint, either local or global, had been selected. The reason for this prerequisite was that if the child evaluated the choice without using contextual constraints, the evaluation would not constitute testing of constraints.

Step 2 was scored for coordination of two contexts and for testing of candidates within the coordinated constraints. For *coordination of contexts*, each choice within each item was

worth 1 point, which was earned if the child referred to both sentences in justifying the evaluation of a choice. For *testing within coordinated constraints*, each choice was worth 1 point, which was earned if the child correctly evaluated the choice, given that both sentences were used in the justification.

Step 3 was scored for the *use of additional contexts to refine word meaning*. One point was scored for each sentence if the child could correctly explain why the sentence did or did not give further clues to the word's meaning.

Step 4 was worth 2 points per item, which were awarded if the child could correctly *identify the meaning* of the word at the end of Step 3. One point was awarded if the child could identify the meaning after the additional sentence was presented.

Step 5 was worth 1 point for each sentence. A point was awarded if the child could correctly *evaluate a sentence that used the newly "acquired" word* as good or bad and could correctly explain why the word did or did not make sense in the context.

RESULTS

The seven scores obtained from the meaning-acquisition task each represented an aspect of the meaning-acquisition process. These aspects were (a) selection of constraints from context, (b) testing a meaning choice within constraints, (c) use of two contexts to constrain meaning, (d) evaluation of a meaning choice given two contexts, (e) use of additional contexts to refine word meaning, (f) identification of word meaning, and (g) discrimination of sentences that use or misuse the newly learned words. The data for the high and low groups on each of the seven scores obtained were analyzed by *t* tests.

Prior to collecting data, it was decided that, in addition to the comparisons made on the seven aspects of meaning acquisition, some more fine-grained qualitative comparisons of response types would also be made. The specific comparisons to be made were not established a priori but rather were directed by patterns that arose within the data.

Because these fine-grained comparisons involved reduced sample size resulting in exaggerated variability for some comparisons, a small *n*, and nonindependent responses, many types of statistical analysis were inappropriate. Thus, comprehensive analyses were not performed on these comparisons. In three selected cases, however, *t* tests were used to assess comparisons that were of particular interest. Only those three comparisons are discussed here.

The results presented are organized around the seven aspects of the word-meaning acquisition process represented by the seven scores obtained from the task. The fine-grained comparisons are discussed within these aspects.

1. *Selection of constraints from context.* High-ability children were significantly better at selecting available constraints from context, $t(28) = 4.47, p = .001$. This result is presented in the first two rows of Table 2.

When children justified their meaning choices in some way other than using the available contextual constraints, their responses were considered incorrect justifications. Incorrect justifications were examined as a fine-grained comparison. Two types were prominent in children's responses. They were labeled as nonuse of context and misuse of context.[1]

Nonuse responses were responses that either gave no information about what evidence children had used to evaluate the meaning choice, or concerned orthographic or phonological features of the words with no semantic information. An example of a nonuse response that gave no evidence occurred when, as a justification, the child either merely read the sentence, substituting the choice for the target word, responded with "it just fits/doesn't fit," or said "I don't know." An example of a nonuse response based on phonological features would be rejecting *brick* as a possible meaning for *narp* because "narp sounds pretty different from brick."

Misuse of context justifications occurred either when the child combined contextual information with outside information to create a "scenario" in which to evaluate a meaning choice, or when the child prematurely restricted possible meaning choices. Thus, in both types

Table 2 Comparisons of the two groups on seven aspects of the meaning-acquisition process

Aspect	Group	Mean (%)	Standard Deviation	Degrees of Freedom
Constraint Selection	High	78.4	9.267	
	Low	61.9**	10.837	28
Constraint Testing	High	91.8	5.181	
	Low	85.5**	6.647	28
Use of Two Contexts	High	53.6	18.071	
	Low	32.2**	20.969	28
Evaluation/Two Contexts	High	78.7	11.437	
	Low	69.1	27.227	18.79[a]
Additional Contexts	High	54.2	13.724	
	Low	39.8**	14.764	28
Meaning Identification	High	81.6	13.023	
	Low	69.4*	12.452	28
Sentence Discrimination	High	86.6	13.763	
	Low	62.8**	21.941	28

[a]Separate variances used to estimate error, which results in partial degrees of freedom.
*Difference in means is signficant, $p < .05$. **Difference in means is significant, $p < .01$.

of misuse responses, the child was developing constraints that did not exist within the context. For example, consider a scenario which occurred in response to the choice *lose* for the artificial word *bafe* in the sentence, "The doctor told her to *bafe* her glasses." A child rejected the choice, saying, "The doctor told her if she lose her glasses, she couldn't get no more." Scenarios represented a kind of free association between the context and meaning choice rather than a consideration of the choice's appropriateness to the context.

An example of a response that restricts the possible meaning of the word occurred in response to the choice *wear* for *bafe* in the sentence, "The doctor told her to *bafe* her glasses." A child rejected *wear* as a possible meaning for *bafe* "cause he told her to remove them" (*remove* was a meaning choice that had been presented previously).

Table 3 presents a breakdown by category for each group's incorrect justification responses. These results represent 14 subjects per group, because 1 subject in each group had no incorrect justifications. The means presented in all tables are unweighted.

As can be seen from the table, the pattern of responses differed between the two groups. For the high-ability group, the nonuse of context category accounted for a greater percentage (65.9) of errors than did the misuse category (21.5). However, for the low-ability group, the

Table 3 Mean percent incorrect justifications in each category for constraint selection

	Category		
Group	Nonuse of Context	Misuse of Context	Other
High (70)	65.9 (52)	21.5 (13)	12.3 (5)
Low (119)	43.8 (53)	37.4 (43)	18.8 (23)

Note. Frequencies are in parentheses.

misuse category and nonuse category accounted for a more nearly equal percentage of errors (37.4 vs. 43.8).

To assess differences in the two groups' errors here, a t test was used to compare the percentage of misuse responses between the groups. This category was tested because it seemed to shed light on errors that can occur in assigning meaning to context.

Despite the apparent discrepancy in the means for the high and low groups (21.5 vs. 37.4), the difference was not significant, $t(26) = 1.51$, $p = .143$. A strong contributor to this result was likely due to 1 subject who made 100% of his errors in this category, while all other children in the group exhibited 50% or less of their errors in this category. Thus there does appear to be at least a trend toward differences between high- and low-ability groups in the types of errors made in constraint selection.

2. *Testing a word choice within constraints.* The high-ability group did significantly better in evaluating meaning choices within constraints, $t(28) = 2.88$, $p = .008$. This result is shown in the second two rows of Table 2. Thus, even when constraints were correctly identified, the low-ability group was at a disadvantage in evaluating meaning choices as fitting those constraints.

3. *Use of two contexts to constrain meaning choices.* The comparison of the two groups on the use of two contexts showed a significant difference in favor of the high-ability group, $t(28) = 2.99$, $p = .006$. This result is shown in the third two rows of Table 2. Thus, when presented with two contexts, the high-ability children were more likely to consider both of them in evaluating a meaning choice.

4. *Evaluation of a meaning choice given the use of two contexts.* Differences between the high- and low-ability groups on this aspect were not significant, $t(18.79) = 1.26$, $p = .223$. As can be noted from the fourth two rows of Table 2, the variances for the two groups for this aspect were discrepant. The variances were significantly different, $F(14, 14) = 5.67$, $p = .003$, which necessitated the use of separate variance estimates to calculate the t statistic.

An additional characteristic of this aspect of the word-meaning acquisition process is that, psychologically, it involves two parts. The first is judging the choice's appropriateness for each sentence, and the second is reaching an overall decision about the choice. For those choices in each item that could either be rejected from both sentences (reject/reject) or accepted in both sentences (accept/accept), a separate step of reaching an overall decision was not meaningful. In contrast, when the choice was accepted in one sentence and rejected in the other (reject/accept), those conflicting decisions must be resolved with one final decision. (Of course, only rejection of the choice can be correct, but nevertheless a conflict is present, due to differential evaluation of the sentences.) Because the reject/accept situations required an extra processing step, the responses for those situations were compared to reject/reject and accept/accept situations.

Table 4 shows the correct evaluation responses of each group broken down to reflect these three situations. These results represent all subjects for the reject/reject cases, all high-ability subjects and 13 low-ability subjects for the accept/accept cases, and 14 subjects per group for the reject/accept cases. As can be

Table 4 Mean percent correct evaluation in reject/reject, accept/accept, and reject/accept cases (Step 2)

	Category		
Group	Reject/Reject	Accept/Accept	Reject/Accept
High	95.7	79.0	26.4
(218)	(120)	(73)	(25)
Low	89.3	71.5	8.3
(111)	(58)	(48)	(5)

Note. Frequencies are in parentheses.

Table 5 Mean percent errors in evaluation of two contexts due to sentence evaluation and overall decision (Step 2)

Group	Reason for Error	
	Incorrect Evaluation of Sentence(s)	Incorrect Overall Decision
High	72.6	27.3
(48)	(30)	(18)
Low	77.3	22.7
(44)	(32)	(12)

Note. Frequencies are in parentheses.

seen from the table, the reject/accept cases stand out in two ways. First, the proportion of correct responses is much lower here than for the reject/reject and accept/accept cases, for both groups. Second, there is an apparent difference between the groups for the reject/accept cases. The difference for reject/accept cases was assessed by a *t* test and found to be significant, $t(26) = 2.05$, $p = .050$.

Because of the two steps involved in evaluating reject/accept cases, a question arises as to what proportion of errors can be attributed to failing to evaluate the choice correctly in each sentence and what proportion is due to failing to resolve the reject/accept conflict, that is, wrongly accepting the choice even though it had been rejected for one of the sentences. Table 5 presents these results. Fourteen subjects from each group are represented. As can be seen from the table, the greater proportion of errors for both groups is due to incorrect evaluation of one or both sentences rather than failing to resolve the conflict correctly.

5. *Use of additional contexts to refine word meaning.* Differences in the ability to obtain correct word-meaning information from three additional contexts were found to be significant between the two groups, $t(28) = 2.77$, $p = .010$. This result is shown in the fifth two rows of Table 2.

6. *Identification of word meaning given direct meaning clues.* The high- and low-ability groups were shown to differ significantly in their ability to identify the correct meaning of the target word, given direct meaning clues, $t(28) = 2.62$, $p = .014$. This result is shown in the second-to-last two rows of Table 2.

7. *Discrimination of sentences that use or misuse newly learned words.* High-ability children were significantly better at discriminating sentences that used or misused the newly learned words, $t(28) = 3.56$, $p = .001$. This result is shown in the last two rows of Table 2.

The errors that children made in discriminating appropriate and inappropriate uses of the target words were examined, and three types of errors were identified. These were labeled context-driven responses, limited concept responses, and misinterpretation responses.

In *context-driven responses,* children did not consider the assigned meaning of the target word to derive an interpretation of the sentence. Rather, either the target word was ignored and the interpretation based solely on the surrounding context, or some other word that had a strong association to the context was substituted for the target word.

An example of a context-driven response that ignored the word is evaluating the sentence, "People dress up and look *narp* (ordinary) on Halloween" as good "cause people do dress up on Halloween." In such cases children either simply confirmed or rejected the validity of the surrounding context, or formed some association to it.

An example of a context-driven response in which a substitution was made is judging the *Halloween* sentence given above as good because "it could mean scary." Here children allowed for a separate meaning for the word, but

that meaning was not semantically independent in that the context of the sentence governed the meaning that the children ascribed to the word.

In *limited concept responses,* children used the assigned meaning of the target word but failed to use the interdependence of word and context to develop a sentence interpretation. An example of this is evaluating the sentence, "If you sign a *linbad* (agreement) it's like making a promise" as bad, because "a promise and a agreement's two different things."

In *misinterpretation responses,* children gave consideration to the assigned word meaning within the context, but arrived at an inaccurate evaluation or interpretation of the sentence. An example is evaluating the sentence, "Sometimes you can end a fight by making a *linbad* (agreement)" as bad because "when they fight, they fight, they not supposed to make an agreement when they fight."[2]

Table 6 shows the percentage of each group's errors in Step 5 attributed to the response types described. These data represent 12 of the 15 subjects in the high group and all of the low group. The percentage and frequencies of error types may seem discrepant, especially for the high group. This is because responses of 2 subjects in the high group were disparate with the set of scores for the group. These 2 subjects were responsible for 77% of the errors in the context-driven category, and they made almost no other errors.

In the low group also, 2 subjects evidenced scores in the context-driven category that were disparate with the rest of the group, although the disparity was not so great as in the high-ability group. These 2 subjects in the low group were responsible for 42% of the errors in that category.

Table 6 shows a very different pattern of errors between the two groups for the context-driven and misinterpretation categories. The context-driven errors are particularly interesting because they may yield insights about difficulties children encounter with the integration of word and context to construct meaning. In order to analyze these data so as not to give undue weight to the highly discrepant scores, a trimming procedure was used. In this procedure, recommended by Winer (1971) for handling extreme observations, equal numbers (in this case, two) of the highest and lowest scores are removed from the sample, and the resulting reduced, or trimmed, sample is treated as the sample data. The means for the trimmed sample were 21.6 for the high group and 44.1 for the low group. The difference was assessed by a t test and found to be significant, $t(17) = 2.29$, $p = .035$.

DISCUSSION

Learning vocabulary through inferring the meaning of new words from context has long been a prevalent and highly recommended technique for vocabulary development. However, research has shown that gaining word meaning from context is far from an automatic process, and particularly that less skilled students are much less likely to succeed in gaining meaning (Quealy, 1969; Rankin & Overholser, 1969). The present study proposed specific aspects of

Table 6 Mean percent errors in each category for sentence discrimination (Step 5)

	Category			
Group	Context-Driven	Limited Concept	Misinterpretation	Other
High (63)	29.2 (34)	22.5 (8)	40.0 (17)	8.3 (4)
Low (191)	45.9 (112)	21.0 (21)	17.5 (35)	15.8 (23)

Note. Frequencies are in parentheses.

the process of acquiring word meaning from context in order to investigate where within the process differences between children with high and low vocabulary ability occur.

Three notions about the process of acquiring word meaning from context can be derived from the results of this study. These notions are, first, that the low-ability group evidenced a misunderstanding of the relationship between word and context; second, that the low-ability group, and to a lesser extent the high-ability group as well, demonstrated a semantic interference when considering two contexts simultaneously; and third, that the performance of both groups indicated the complexity of the meaning-acquisition process.

Misunderstanding of the Relationship Between Word and Context

The poorer performance of the low-ability group in the selection of contextual constraints and in the use of newly learned words, as well as the nature of their errors within these two aspects, seems to indicate a misunderstanding of the relationship between a word and the surrounding context. The understanding of this relationship comprises an awareness that concepts in context represent limits that constrain but do not determine word meaning. Using these limits implies a recognition of the type of information that is appropriate to the task of deriving meaning, for numerous associations can be made to a given context, but not all will be supported by the context.

Excerpts from children's protocols serve to illustrate this notion of contextual limits and the differential understanding of the limits shown by the high- and low-ability groups. Consider a response from a high-ability group child to the choice *scared* for the word *depcro* in the sentence, "The worried rider couldn't control the *depcro* horse": "It might mean scared, cause somebody could have shot a bullet or something, made it scared, and he couldn't control it." This child reasons by bringing in an example of something that could cause a horse to become uncontrollable. The example helps her to understand the relationship between *scared* and *controlling a horse*, and obeys the limits set by the context. In contrast, consider the following response from a low-ability group child about the choice *size* for the word *linbad* in the sentence, "After working on the problem the group was ready to make a *linbad*": "Yes, they probably buy a dress and didn't know what to do, so they probably figured out their problems and found a size." Here, too, the child is attempting to develop a relationship between a part of the context (working on a problem) and the meaning choice (size), but he ends up with a scenario that is not supported by the context. As these examples demonstrate, working within contextual limits enables one to extract accurate information about potential word meaning from context.

Semantic Interference in Considering Two Contexts

When considering two contexts for evaluating word-meaning choices, both groups were very accurate in reject/reject cases, somewhat less accurate in accept/accept cases, and showed much poorer performance in reject/accept cases. Although this pattern held for both groups, the high-ability group was found to be more successful in reject/accept cases.

When two sentences were used, the most common response was to reject the choice in both sentences. This was true to the extent that not only were most reject/reject cases correctly evaluated, but rejecting the choice in both sentences was most often the response when accept/accept and reject/accept cases were incorrectly evaluated. One explanation of this tendency is the notion of a semantic interference between the two contexts. That is, the meaning obtained from one context is carried over to the other and interferes with an accurate evaluation of the second context. Consider first the accept/accept cases. The tendency to reject the choice

in both sentences here may stem from difficulty in fitting a word to two contexts that reflect somewhat different senses of the word. For example, items for sale in a store are *ordinary* in a somewhat different way than a person is *ordinary;* boys and girls *growing* up is different from *growing* corn. Because a choice may not seem to fit each context in the "right" way (i.e., the same way), it may be rejected. This notion is a speculation, and the only support that can be offered is that children seemed able to make correct judgments in Step 1, when a single sentence was presented, about the same choices that were incorrectly rejected in Step 2, when two contexts were given.

In reject/accept cases, interference may occur in that a context from which a choice can be easily rejected carries over a reject bias to the second context. For example, the two sentences presented for the *depcro* item were, "The woman at the desk was too *depcro* to move," and "The zookeeper tried to get the baby lion into the cage, but the lion was too *depcro*." The choice, *fast,* can readily be rejected from the sentence about the woman, because of the impossibility of being "too fast to move." This implication of inaction, then, may carry over to the lion sentence, and *fast* is rejected there as well. In support of this notion, it is noted that when children consider both sentences here, the choice is rejected in both sentences in 14 of 18 cases. However, when children attend only to the *lion* sentence, *fast* is correctly accepted in 5 of the 6 cases. This pattern of interference in reject/accept cases appears several times in the data.

The evidence of semantic interference suggests that multiple contexts may impair the ability of low-ability learners to derive information from context regarding word meaning, at least if they are left to do so on their own. High-ability learners were also involved in the pattern of poorer performance in reject/accept cases. Perhaps, then, it requires semantic sophistication beyond the level of the children in this study to take advantage of multiple contexts.

Complexity of the Task of Meaning Acquisition

Certain findings of this study serve to underscore the notion that acquiring word meaning from context is a complex process in which a series of processing steps must contribute to achieve a successful outcome. What this complexity means operationally is that, even under conditions that seem nearly optimal, successful outcomes may not be forthcoming. Specifically, such circumstances arose in three places within the findings of this study. The first is the finding that low-ability children were less able to test a meaning choice correctly within constraints they had identified from context. In cases of incorrect constraint testing, children succeeded in identifying a part of the context that did constrain meaning, but then failed to use it in evaluating their choices. Thus, even under what would appear to be optimal conditions, that is, the correct identification of constraints and the availability of meaning choices, successful testing of a choice within constraints does not automatically occur, at least for children of lower ability.

Another indication of task complexity occurred in the identification of word meaning. The low-ability group was less successful at identifying the correct word meaning than the high group. This speaks to the issue of complexity because in this study several contexts for each word, developed with very deliberate clues including direct clues to word meaning, were presented consecutively to each child individually. Yet, even within this very structured environment, differences were found between high- and low-ability groups.

A third indication of the complexity of the meaning-acquisition process is that a simple operationalization of learning a word, that is, either deriving a correct definition from context or being told the definition, did not, for the low-ability group, translate into ability to use the newly learned word to interpret subsequent sentences that immediately followed the learning task. This suggests that low-ability children are

not only at a disadvantage in deriving word meaning, but, once word meaning is provided, they remain at a disadvantage in applying the new word.

Instructional Implications

The characterizations of processing discussed in this article carry implications both for instruction in the use of context to derive word meaning and for direct instruction of vocabulary. First, three aspects of the process of acquiring word meaning from context were the most directly implicated in the differences between effective and less effective use of context. These three aspects, selecting constraints from context, taking advantage of multiple contexts, and using new words following initial learning, might be considered as possible topics for instruction in using context. However, the findings of this study indicate that the presentation of effective instruction in these areas is not straightforward, because success within these aspects did not always yield an overall successful outcome. For example, for the low group especially, selecting appropriate constraints did not always lead to getting correct information about word meaning.

The way that the development of the ability to use context is usually addressed is to provide children with a wide variety of contexts that may contain unfamiliar words, with perhaps some general direction that one should look within and around the target sentence for clues to word meaning (e.g., Durr, 1976). Less frequently, specific types of clues, such as cause and effect, synonym, etc., may be directly introduced. However, the findings of this study suggest that it is not enough to teach children where constraints are located in contexts or the various forms constraints may take or to reflect on multiple contexts when available. What needs to be learned is more elusive, such as to what extent outside information can be brought to bear without violating the limits of the context, and the amount of flexibility allowed in assigning meaning to concepts within the context.

Work of other researchers supports the notion of the problematic nature of deriving word meaning from context and the difficulty of overcoming these problems through instruction. Sternberg and Powell (1983) set forth a theory of learning from context that hypothesizes that the likelihood of learning word meaning from context depends not only on information available in the context but also on factors such as weeding out irrelevant information, integration of information gleaned into a coherent word meaning, and usefulness of prior knowledge. These factors are labeled mediating variables. In some preliminary results, Sternberg and Davidson (1983) showed that although teaching students to use context clues did improve performance, mediating variables played a substantial role in the success of the instruction.

Carnine et al. (1984), in reviewing factors contributing to successful use of context for acquiring word meaning, cite the importance of a reader's past experience in using context, which sets up a kind of "chicken/egg" problem. Carnine et al. then instructed students in the use of context clues. Although instructed students were able to use context more effectively, the authors concluded that a more potent instructional strategy was called for to teach context skills to an acceptable level.

Based on the nature of the task of acquiring word meaning from context as demonstrated by the present study and by other researchers, it seems that the technique of teacher modeling would be well suited to improve children's context skills. A teacher could communicate important concepts of acquiring word meaning from context by demonstrating the use of context to derive contextual constraints, test candidates, compile information about the word's meaning, and eventually interpret subsequent contexts.

The suggestion to use teacher modeling for developing context skill parallels a discussion by Carnine et al. (1984) about the kind of instruction that is adequate for teaching various cognitive skills. They assert that while certain conceptually easy skills can be taught through techniques such as systematic practice, other, more complex, skills require the use of "system-

atic modeling and questioning" (p. 201). Carnine and his colleagues have shown the effectiveness of incorporating modeling into the instruction of various comprehension skills such as critical reading (Patching, Kameenui, Carnine, Gersten, & Colvin, 1983), study skills (Adams, Carnine, & Gersten, 1982), and text-based inferences (Carnine, Kameenui, & Woolfson, 1982).

The use of teacher modeling for the instruction of complex skills is also advocated by Collins and Smith (1982). They recommend the technique as a first step in developing comprehension-monitoring ability, describing it as a "kind of 'slow motion' film of the way comprehending takes place in a sophisticated reader" (p. 175).

To model the meaning-acquisition process, a teacher could present a context containing an unknown word and work through it toward deriving the meaning of the word. With subsequent contexts, the teacher could show how additional information might eliminate or confirm certain meaning choices. After exposure to teacher modeling, the children could begin to think aloud the information they infer from contexts, and receive teacher feedback. Exposure to successful models and interactive practice in deriving information from contexts could give children the opportunity to develop a sense of how to use context to take advantage of the information it offers without bringing to bear information that is irrelevant or causes interference.

The suggestion for the use of a modeling strategy can be extended to direct instruction in vocabulary. Providing models of interpreting contexts containing new words that are being learned could help children to understand that word meanings have both stable and flexible elements and to develop ways to apply words in new contexts and test their appropriateness. This type of knowledge about word meanings may lessen the problems demonstrated in this study in the use of new words following a learning experience that involved only a correct definition. The implication is that having a correct definition, or exposure to multiple contexts, is not enough—at least for low-ability children—to allow a word to become a useful part of one's vocabulary repertoire. Indeed, such limited experience may not be sufficient for high-ability children either. Although high-ability children were more successful in using the newly learned words in this study, only a very limited concept of word use was tested, and it was done immediately following learning.

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Footnotes

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[1]In addition to these two response types, which accounted for over 80% of the incorrect justifications in each group, an "other" category was necessary. This category consisted both of responses that could be categorized, but whose categories contained four or fewer responses over both groups, and of responses from which no interpretation of the child's justification could be made.

[2]A category of "other" responses was also necessary, and contained responses such as "I don't know," and those that were unique or difficult to interpret. One such example was the response to the sentence, "It's *narp* (ordinary) to wear boots in winter weather": "No, it's just the weather, and you don't wear boots if it's just the weather."