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ABSTRACT
        A study was conducted to examine students' reading
difficulties from a metacognitive perspective by considering the
content of their awareness and the control they demonstrated over
that awareness as they reflected on similarities and differences in
various types of reading materials. Subjects were 35 seventh grade
students representing seven different achievement levels on the
reading comprehension and vocabulary subtests of a standardized
achievement test. The repertory grid technique devised by G. A. Kelly
was used to elicit subjects' constructs about nine different types of
reading materials (including advertisements, maps, and storybooks)
that represented different purposes and comprehension levels and
offered chances for subjects to construe both surface and deep level
structures. Significant differences were found on the number of deep
level constructs among the low, middle, and high ability groups.
Although high achievers used more deep level constructs that were
elaborated and refined, they did not reduce their number of surface
or low level constructs. Cluster patterns representing the
organization of materials according to similarity of reading purposes
were found in a moderate degree at the middle achievement levels;
however, complexity cluster organization, construction, and
integration were evident only in the highest level. The 10 content
categories that emerged from the constructs were highly similar for
all achievement levels. The report includes a five-page list of
references. (FL)

Construct Systems of Seventh-Grade Students and Their

Relationships to Reading Achievement

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Running Head: Construct Systems of Readers

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Abstract

Construct systems of seventh-grade students at varying reading achievement levels were investigated to consider the metacognitive awareness that these students' constructs reflected. Thirty-five subjects (5 from each achievement decile 30th through 90th) were randomly selected from 398 students and asked to compare and contrast nine types of reading materials (e.g., map, advertisement, storybook). Significant differences were found to exist on the number of deep level constructs among the low, middle, and high ability groups. Although high achievers were found to use more deep level constructs which were elaborated and refined, they did not reduce their number of surface or low level constructs. Cluster patterns representing the organization of materials according to similarity of reading purposes were found in a moderate degree at the middle achievement levels; however, complexity in cluster organization, construction, and integration was evidenced only in the highest achievement level. The ten content categories that emerged from the constructs were found to be highly similar for all achievement levels.

Construct Systems of Seventh-Grade Students and Their

Relationships to Reading Achievement

Emphasis on finding viable answers for difficulties
students have in reading has led some researchers to
investigate questions dealing with students' concepts of
reading. Basically, students' perceptions of reading have
been considered from two major research perspectives:
metalinguistic and metacognitive.

Researchers concerned with the metalinguistic
perspective have investigated children's concepts of reading
instruction terminology (e.g., Reid, 1966; Downing & Oliver,
1973-1974), orientations to books and print (e.g., Clay,
1973), and awareness of oral-written relationships (e.g.,
Mattingly, 1972). Generally, findings indicated that
beginning readers were not aware of instructional
terminology and literacy behaviors (e.g., top to bottom
progression). In addition, concepts of letters, syllables,
and word units have been found to develop through reading
instruction and encounters with written language (e.g.,
Clay, 1973; Francis, 1973; Ehri, 1979).

Studies that have specifically dealt with students'
concepts of reading from a metacognitive perspective have
investigated the underlying understanding or the semantic
realm of students' perceptions of "what reading is" (e.g.,
John & Ellis, 1976) as well as conceptual influences on

their reading performance (e.g., Canney & Winograd, 1979;
Myers & Paris, 1978). In general, researchers have suggested
that readers experiencing difficulty comprehending also view
reading as a code rather than a process of gaining meaning
(Johns & Ellis, 1976; Tovey, 1976; Myers & Paris, 1978;
Canney & Winograd, 1979; Gambrell & Heathington, 1981;
Garner & Kraus, 1981-1982). These researchers described
code-based readers as those who attended to surface level
cues (Smith, 1975) and graphophonic cues (Goodman, 1970)
involving visual observations or sound-symbol relationships.
In contrast, meaning based readers are described as those
who attended to deep level cues, understanding, and
prediction (Smith, 1975; Goodman, 1970).

Students' acquired reading concepts have been found to
be reflected in their achievement (Edwards, 1962; Johns,
1972; Canney & Winograd, 1979). Good readers, employing
metacognitive strategies in comprehension, were found to
monitor context more efficiently and were better able to
recognize text alterations (e.g., Isakson & Miller, 1976;
Raphael, Myers, Tirre, Fritz, & Freebody, 1981). In
addition, better readers were more likely to self-correct
(Clay, 1969) and their corrections were found to be better
approximations of the letter order represented in the text
(Weber, 1970). Different types of readers from various age
groups were not found to increase their use of strategies or
regulations of reading as materials were increased in

difficulty (Olshavsky, 1978) nor were their views of the
reading process found to vary when different materials or
subject matter were presented (Stansell, Harste, & De Santi,
1978). However, a basic question posed by Johns (1974)
asking what a meaningful concept of reading should include
is still being considered by researchers. Recently,
discussions have involved metacognitive awareness (i.e., the
knowledge and control over thinking and learning) and the
relationship metacognition has in the development of
efficient readers (Brown, 1982).

Previous studies attempting to gain access to students'
metacognitive perceptions of reading have mainly relied on
interview techniques. Examples of questions include "What is
reading?" (e.g., Oliver, 1975), "What do you think you do
when you read?" (Tovey, 1976), and "What things does a
person have to do to be a good reader?" (Garner & Kraus,
1981-1982). Although older readers were found to be better
able to describe their metacognitive awareness (Myers &
Paris, 1978), verbalizations about what "reading is" were
found to be limited and often defied explanation (Mason,
1967; Oliver, 1975; Johns & Ellis, 1976). The present study,
utilizing Kelly's (1955) repertory grid technique, attempted
to gain further insight into students' reading difficulties
from a metacognitive perspective by considering the content
of students' awareness and the control they demonstrated
over their awareness as they reflected on similarities and

differences in various types of reading materials.

Theoretical Framework

Personal Construct Theory

The personal construct psychology of Kelly (1955) was used as the theoretical base to explore students' concepts or constructs about reading. Kelly proposed that as individuals seek to make sense of the world they develop an organized network of constructs that they use to control, predict, and anticipate events. Therefore, individuals' perceptions in a given situation are determined by their unique, subjective cognitive patterns or "templates" which they have created to develop a theory about reality. Individuals' construct systems or theories continuously change as they validate the accuracy of their anticipations. Hypotheses, tests of experiences, and reconstructions within individuals' systems either enrich or stabilize the basic features of their psychological processes. As construct systems change, individuals change.

Kelly posited that individuals' cognitive systems are composed of dichotomous constructs (e.g., friendly/mean, friendly/unfriendly) that are used to differentiate between and among elements (i.e., individuals, objects, situations) in their environments. Constructs are created when two elements are viewed as similar and in contrast to a third.

As a construct is developed, a range of convenience is
formed to refer to those elements for which the construct
has some applicability. The network of relationships that
exist between and among the constructs may be correlational,
logical, or scalar.

Kelly's Method of Measuring Constructs

Kelly (1955) devised the repertory grid technique as a
means of eliciting dichotomous poles of constructs for a set
of elements. It is a qualitative, nonparametric technique
originally used to explore individuals' interpersonal
construing of different role types. Since the development of
the grid, researchers (see Bannister & Fransella, 1980 and
Pope & Keen, 1981) have found the technique useful in
determining the content and organization of individuals'
construct systems, the tones of their systems, and the
degree of abstractness, flexibility, and interest of their
systems. Specifically, this investigation examined: (a) the
frequencies of both surface and deep level structure
constructs among different achievers; (b) the core content
categories of seventh-grade readers' constructs; and (c) the
relationship of students' achievement and the organizational
clusters found within their construct systems.

Method

Subjects

The combined normal curve equivalent (NCE) scores of
the reading comprehension and reading vocabulary subtests on
the California Achievement Test of 398 seventh-grade
students were sorted into nine possible decile placements.
The NCE scale range for this test is 1 to 99 with an average
mean score of 50. The achievement score distribution for the
particular school from which the sample was drawn had a mean
score of 64.4. Adequate representation of the two lower
deciles (1-9 and 10-19) was not found; therefore, these
groups were excluded. Thus, five students were randomly
selected from each achievement decile between 30 and 99.
These thirty-five students (16 girls and 19 boys)
represented seven achievement levels and served as subjects.

Materials

The repertory grid technique was used to elicit
dichotomous constructs about specified materials that
involved print. Elements were represented in object form
with nine types of reading materials. These included an
aspirin box with printed dosage directions, a state map, a
familiar storybook, an encyclopedia, a dictionary, a
specific topic book about seashells, a paperback comic
collection of a familiar cartoon character, a detailed book
of instructions for a game, and a newpaper jean

advertisement. Care was taken to select printed materials found in the subjects' environment that would not be considered to represent either highly positive or negative connotations. Criteria for element selection included: materials that represented different purposes and comprehension levels; possibilities for the subjects to construe surface level and deep level structures; elaborated and concise materials; fiction and nonfiction materials; and materials that contain a variety of topics and those that were about one topic.

Procedure

The nine types of (reading materials) were placed on a table in front of the subject in the order listed on the elicitation grid sheet (see Figure 1). The subject was told

Insert Figure 1 about here

that "the purpose of the game or puzzle is to explore your views about reading." The subject was then asked to name the items. The subject's attention was drawn to the first three items and was asked to say in what way two of them were alike (this became the emergent pole of the construct) and in what way the other element was different (this became the contrast pole of the construct). The subject was then asked to place the remaining items with either one or the other of the construct poles. The materials were physically placed at

either extreme by the subject. Triads of elements used to elicit the sort were presented sequentially. Frequently, in pilot data as well as the present study, the imposed preplanned elicitation was not suitable after the first few sorts. When it did not appear beneficial to continue the planned order of sorts, the subject was asked to find two items in the materials that were similar in some way. After the two similar items were selected, the subject was asked to find one that was different. Providing students with this choice of triad selection generally increased the number of constructs. However, all subjects in the present study were asked sometime during the elicitation session to consider the first seven sorts listed on the elicitation grid sheet. The elicitation process continued until the subject could no longer identify any new construct about the elements. The above data collection lasted approximately 35 minutes for each subject.

Coding and Collecting the Data

Each subject's constructs were recorded on a single sheet that had been previously prepared to include the elements. These elements were placed across the top, and blanks on either side of the page served as a place to record the subject's dichotomous constructs. An example of a subject's protocol is shown in Figure 2.

Insert Figure 2 about here

Blank boxes between the dichotomous constructs were used to record a √ or an x. If the element was representative of the emergent pole, a √ was placed in the appropriate grid box. If the element was assigned to the contrasting pole, an x represented this choice. A dash (-) was recorded if the subject had difficulty applying a particular construct to an element. A record of the sorts, placed on the left of the grid sheet, noted the triad that prompted the construct. However, a construct response was not always given. When this occurred, a slash was placed through the triad sort number and the subject was asked to consider the next sort. Additional triad selections that were spontaneously given by the subject were recorded by simply placing a dot by each element that initiated the construct.

Results

Construct Frequency

Students in the study gave a total of 275 constructs. Sixty-eight per cent of the constructs were determined to be deep level and the remaining thirty-two per cent were considered surface level. Each construct was determined to

be unique by considering (a) the amount of differentiation used in comparing and contrasting the elements and (b) the verbal labels attached to the differentiation. Equivalent constructs, then, would be those in which the subject construed the elements exactly and/or restated or used similar verbal labels. Verbal labels or constructs, were then categorized as to their surface level or deep level. Surface level constructs were defined as those attending to visual observations and graphophonic representations of print (e.g., large print/small print, pictures/no pictures). Deep level constructs were defined as those attending to inference, interpretation, and semantic observations (e.g., fiction/nonfiction, sequential character development/no character development). Three raters independently categorized the constructs as surface level or deep level yielding a mean percentage of agreement of 93.5. The number of constructs given by the students ranged from 2 to 14. The mean and standard deviation for the deep level constructs and surface level constructs are presented in Table 1.

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Insert Table 1 about here

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To determine the relationship between reading achievement and the number of surface level and deep level constructs, the 35 subjects, representing seven achievement levels, were divided into three groups (low, middle, and

high). The groups were determined from the distribution
found within the seventh grade from which the sample was
drawn. The low group represented achievement scores that
ranged from 30 to 49, the middle group ranged from 50 to 79,
and the high group ranged from 80 to 99. Table 2 presents
the mean scores for each group on deep level and surface
level constructs.

Insert Table 2 about here

A one-way ANOVA was performed on the deep level and
surface level constructs for each of the achievement groups.
Significant differences were found on the deep level
constructs ($\underline{F}$ = 10.5, $\underline{p}$ < .01) among the three groups of
readers. A significant difference was not found to exist
among the three groups on surface level constructs ($\underline{F}$ = .05,
$\underline{p}$ > .05). A Newman-Keuls test, based on 10 in each group,
indicated significant differences ($\underline{p}$ < .05) in deep level
constructs between the low and middle groups and the middle
and high groups.

Correlation provided a better estimate of the magnitude
of the relationships between achievement and the levels of
constructs. Pearson's coefficient of correlation revealed
the relationship between achievement and deep level
constructs to be $\underline{r}$ = .61, ($\underline{p}$ < .001). No significant
correlation was found to exist between achievement and

surface level constructs ($\underline{r}$ = .088).

Verbal Content Categories

The verbal labels used by students were sorted by the researcher to isolate categories that were distinct in the subjects' construct systems. The extent of conceptual overlap is unknown; therefore, the categories are not intended to represent distinct purposes but the core groupings the subjects used as they differentiated between and among the reading materials. The verbal content analysis of the 275 constructs indicated that 10 core categories would account for the classification of 99.8 per cent of the constructs. The following categories emerged from the verbal content analysis: story (13%), directions (11%), information (9.5%), advertisement (8%), provides help (8%), topics (7.6%), entertainment (6.5%), fiction (6%), pictures (6%), and materials (words, 3.6%; format, 11.6%; and subject matter, 9%).

Major differences in core categories were not found among the different achievement levels. Students' responses at different achievement levels, then, did not necessitate the establishment of unique categories. However, some qualitative differences in verbal labels (constructs) were found within the categories which related to different achievement levels. Higher level achievers (70 to 99) were found to use surface or low level constructs as well as deep, elaborated, and complex constructs. However, the

reverse was not true. Lower level achievers (30-0?) were found to use surface level constructs but not elaborated deep level constructs. For example, in the story category, low achievers used the construct "story/not story" to sort the materials while high achievers used characterization (e.g., "talking people in book"); setting (e.g., "gives background," "imaginary place"); and plot (e.g., "tells happening"). In other words, high achievers should not be expected to always give verbal labels representative of deep level constructs nor should verbal labels representative of surface level constructs be used as a means of gaining insights into different achievement levels.

Methodological note. The verbal content in the core category materials was influenced to some extent by the choice of reading materials. One concern in selecting the reading materials was that subjects might react to the specific item (e.g., jeans) rather than the type (e.g., advertising). This concern was apparently unnecessary as 75.6 per cent of the constructs related to the type of reading material represented rather than the specific item. However, the three subheadings under the core category materials: words, format, and subject matter were found to contain specific references (e.g., brief/more to read, hard cover/paper cover, about Indians/not about Indians) to the characteristics of the particular items used in the study. These subheading categories would be expected to change or

disappear in subsequent replication studies when different reading materials are used to elicit constructs.

Relationships Construed Among Elements

The relationships that subjects construed among the elements were determined by analyzing the element clusters of each of the seven achievement levels. Sorting patterns from the raw grids were entered into the Sociogrid computer program (Shaw, 1980). This program considered each construct pattern given by individual group members and calculated the degree of shared agreement or overlap among the group's grids. The common patterns for each group were then entered into the Focus computer program (Shaw, 1980) which produced element clusters. The clusters of the focused grids were analyzed by considering: (a) the abstraction or differentiation within the system; (b) the complexity of the clusters including the interrelations among the clusters and the hierarchical arrangement of the clusters; and (c) the integration of the elements within the subsystems.

The element clusters of low achievers were found to be limited in: abstraction (e.g., did not differentiate among the types of materials); organization (e.g., did not recognize likenesses and differences in the materials' structure); and integration (e.g., did not relate all items within the subsystems). Variations were found among the low achievers in sorting patterns and verbal labels. For example, one student in the 40 achievement range placed the

narrative or storybook in the construct pole <u>fact</u> while
another student in this range of achievement placed the
storybook, the shell book, and the cartoon book in the
construct pole <u>story</u>. Although element clusters of the low
achievers generally indicated a distinction between
fictional and nonfictional materials, they were not
characterized by sorting materials according to other
represented purposes (e.g., instructions).

Middle achievers' element clusters often contained
pairs of elements that indicated a moderate organization
capability to sort materials according to information,
directions, and entertainment purposes. However, subjects in
this achievement range, as well as those in the low group,
often paired the unusual materials (i.e., aspirin box and
advertisement) on concrete characteristics. The middle
achievers' clusters were usually characterized by
fragmentation and a lack of abstraction.

Only the clusters formed by the construct patterns of
the highest achievers (90-99 level) clearly represented
ability to construe purposeful relationships among the
elements. The materials were organized and related into the
following clusters: cluster <u>a</u> (see Figure 3) represented

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Insert Figure 3 about here

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entertainment and fictional materials; cluster <u>b</u> represented

general information and factual materials (encyclopedia and
dictionary) with linkage and integration at a highly related
level to types of materials providing specific information
(shell book and advertisement); and cluster c represented
concise instructions or directions materials (map and
aspirin box) with linkage and integration to a type of
reading material providing elaborated instructions (game
book). Cluster a containing the stoybook and cartoon book
was determined by the group to have the least relationship
to the other clusters. Thus, when these high achievers were
asked to compare and contrast the different types of reading
materials, they clustered the elements containing factual
content into two subclusters b and c. This group considered
each element unique in that no two were construed to be
similar at the 100 per cent level. Therefore, complexity was
evidenced in (a) construction, represented by the
differentiation or abstraction which formed the clusters;
(b) organization, characterized by an hierarchical system
composed of interrelated subclusters; and (c) fragmentation,
represented by the integration of all elements into the
subsystems.

The construed relationship differences among the
achievement levels were found to exist in the organizational
structure of the element clusters. Only the highest level
achievers inferred underlying structures of all represented
material types and sorted the materials into organized

clusters. In contrast, subjects in all other achievement
levels were restricted in their ability to construe
similarities among the various types of reading materials.
They often paired the unusual elements and grouped the same
pair or triad of elements together on all sorts without
distinctly differentiating between each item.

Discussion

This section includes a discussion of three major
findings about metacognitive awareness which appeared to be
the most important of the study. Additional discussion
includes speculations and possible implications for
classroom instruction.

The first finding to be discussed is the relationship
that was found to exist between frequency of deep level
constructs and reading achievement as evidenced by a
correlation of r = .61. This finding is comparable to those
of Canney and Winograd (1979), Gambrell and Heathington
(1981), and Garner and Kraus (1982) who probed the
relationship between concepts about reading and achievement
and found that better readers focused on meaning in their
responses while poorer readers focused on decoding and
mechanical aspects. In the present study, a significant
difference was found among the low, middle, and high
achievement groups on their use of deep level or inferential

constructs. Differences between the low and middle groups
and the middle and high groups were also statistically
significant. Therefore, the frequency of deep level
structure constructs could be predicted to increase
significantly from low to middle achievement groups and from
middle to high achievement groups.

The second finding is related to subjects' use of deep
and surface level constructs. Although high level achievers
in the present study were found to use significantly more
elaborated and refined deep level constructs than the middle
or low achievers, they did not reduce their number of
surface or low level constructs. No difference was found to
exist among the low, middle, and high achievement groups on
their use of surface level constructs. A speculative note
drawn from Kelly's (1955) organization corollary about this
finding would suggest that as students' cognitive systems
develop they do not lose their ability to differentiate in
simple concrete terms, but they extend their range of
differentiation. This increased differentiation, as
evidenced by the students' use of deep level constructs,
allowed the higher achievers to approach the reading task
with a more complex set of constructs. This second finding
is similar to the results Johns's (1972) reported in which
half of the better readers' responses were categorized as
nonmeaningful. Johns (1974) noted these variations of better
readers to give meaningful and nonmeaningful responses and

posed a question as to what a meaningful concept of reading should include. One conclusion drawn from the findings of this study would suggest that high achievers do not always give verbal labels representative of meaning or deep level. However, based on the results of the present study, high achievers could be expected to give more deep level constructs than surface level constructs. The ratio of deep level constructs to surface level constructs was 3:1 for the high achievement group, 2:1 for the middle achievement group, and 1.4:1 for the low achievement group.

The third major finding relates to differences found along the achievement continuum among readers' capacities to recognize underlying purposes of the reading materials represented by the elements in the study. Cluster patterns representing the organization of materials according to similarity of reading purposes were found in a moderate degree at the middle achievement levels; however, complexity in cluster organization, construction, and integration was evidenced only in the highest achievement level. This finding is consistent with those of Canney and Winograd (1979) and Hickman (1977) who found that skilled readers had a meaning priority based in purposefulness and usefulness. Smith (1967) found that good readers made more strategy adjustments when different reading purposes were specified. Brown (1982) suggested that less able readers do not sense the need to be strategic or plan ahead so helpful

"expectations to guide the reading process" (p. 43) can be determined prior to the reading act. A relationship, then, appears to exist between reading achievement and the ability to identify and relate different types of materials according to their purpose, features, or structure. Myers and Paris (1978) suggested that awareness of task parameters (i.e., information that a person has and uses during an activity) in reading "reflects a general developmental accomplishment" (p. 689) acquired in settings, situations, and with age. While age may well correlate with increased task awareness, the present study controlled for age by limiting the subjects to seventh graders and yet dramatic differences in metacognitive awareness were found to exist. Deficiencies appear to be related to the content of the metacognitive awareness. Subjects who gave more semantic descriptions of the materials (i.e., deep level constructs) were found to have higher reading achievement scores. Therefore, the content of the metacognitive awareness appears to (a) guide the intentionality by which students approach different reading materials and (b) ultimately affect students' reading achievement.

Implications For Instruction

A pressing question which is currently being considered is whether metacognitive knowledge about reading should be

explicitly taught in training sessions or be implicitly
acquired through meaningful reading experiences (Kendall &
Mason, 1982). Findings of the present study appear to
suggest that only the very highest achievers were able to
make sense of these common reading materials. However, this
finding does not necessarily support training students to
consciously sort reading materials according to their
purposes in order to increase their reading achievement
and/or metacognitive awareness. The necessity of training
students in metacognitive awareness would possibly be a
superficial means of glossing over deeper inadequacies. In
the present study, low and middle achievers' construct
systems appeared to lack complexity in organization,
construction, and integration. An assumption of the present
study was that subjects' constructs reflected the networks
that they have developed in making sense of previous reading
tasks. Kelly's (1955) theory implies that change within
individuals' cognitive systems occurs when understanding
takes place. In other words, if students have not understood
that the reading process is an interactive process used to
gain meaning, they are restricted in their ability to
approach reading tasks.

One main influence from which students derive their
constructs of reading is through classroom instruction
(e.g., Reid, 1966; Downing, 1969; Tovey, 1976; Harste,
Burke, & Woodward, 1981). Some researchers have suggested

that reading instruction needs to be meaning based where students are actively involved in a thinking process (e.g., Denny & Weintraub, 1966; Downing, 1969; Canney & Winograd, 1979; Nichols, 1984). Clay (1969) in a review of the effects of reading programs on different types of students, suggested that poor readers' problems appeared to be related to being unable to put it all together rather than to learning a particular reading skill. Findings of the present study would support this premise. Low and middle achievers' interpretations of the sorting task reflected limited conceptualizations which were inconsistent in inference or deep level structure. It appears that findings of the present study would provide theoretical support for reading instruction with a meaning emphasis. Instruction concerned with meaning would reduce uncertainty about the reading process and would promote the formulation of constructs reflecting reading purposes, inference, and predicting capabilities. Support for this suggestion can be found among researchers who have suggested that readers' constructs or acquired knowledge determine strategies used to make sense of the context (Armbruster, Echols, & Brown, 1983) and knowledge intentions guide the reading process with prediction and control (Myers & Paris, 1978). The restricted ability of the low and middle achievers in the present study to sort the materials according to purpose indicated a deficiency that would appear to limit the way they approach

reading tasks. Success in reading, therefore, appears to be related to readers' constructs which guide their strategies.

Additional exploration in the areas of metacognition and reading is needed in order to determine the extent to which instruction influences readers' constructs. Investigations that probe relationships between the influences that different reading approaches have on students' unconsciously acquired knowledge about the reading process and their conscious intentions on reading tasks should provide needed information about instructional practices. Possibly a better understanding of students' perceptions of reading experiences would lead to instructional practices that promote the development of constructs reflecting inference and predicting capabilities.

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Footnote

Table 1

Construct Means and Standard Deviations for Total Sample

	M	SD
Deep level	5.342	2.436
Surface level	2.514	1.482

Table 2

Comparison of Achievement Groups on Deep and

Surface Level Constructs

	Achievement groups		
	Low	Middle	High
	$\underline{M}$	$\underline{M}$	$\underline{M}$
Deep level constructs	3.4	5.3	7.4
Surface level constructs	2.5	2.6	2.4

Figure 1. Elicitation grid sheet.

1) This is a game (puzzle) about reading.

2) Let's name the items:

NAME _____

3) First Triad , etc. - "In what important way are two of them (these) alike but different from the third?" (Kelly, 1955, p. 222).

4) Could you place the other items in _____ and _____?

EMERGENT POLE √ (1)	aspirin box E1	map E2	storybook E3	encyclopedia E4	dictionary E5	shell book E6	cartoon book E7	game book E8	advertisement E9	CONTRAST POLE X (3)
	1	1	1							
			2	2	2					
					3	3		3		
		4		4			4			
							5	5	5	
	6	6		6						
						7		7	7	
	8		8				8			
					9	9			9	

ORDER OF ELEMENT PRESENTATION

Figure 2. Example of a subject's protocol.

1) This is a game (puzzle) about reading.

2) Let's name the items:

NAME _____

3) First Triad , etc. - "In what important way are two of them (these) alike but different from the third?" (Kelly, 1955, p. 222).

4) Could you place the other items in _____ and _____?

Sort	EMERGENT POLE ✓ (1)	aspirin box E1	map E2	storybook E3	encyclopedia E4	dictionary E5	shell book E6	cartoon book E7	game book E8	advertisement E9	CONTRAST POLE X (3)
	Helps You	✓	✓	✗	✓	✓	✓	✗	✓	✓	Just to Read
	Non Fiction	✓	✓	✗	✓	✓	✓	✗	✓	✓	Fiction
2	Read Some of it	✗	✓	✓	✓	✓	✓	✗	—	✗	Read All of it
3	Help Solve Something	✓	✓	•✗	✓	•✓	✓	✗	•✓	✗	Doesn't Help Solve
4	Help You Find Something	✓	✓	✗	✓	✓	✓	✗	✓	✓	Don't Help You
5 6	Help You Write Report	✗	✓	✓	✓	✓	✓	✗	✗	✗	Won't Help You Write Report
7	Read for Fun	✗	•✗	•✓	✗	✗	✓	•✓	✓	✗	Would not Read for Fun

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Figure 3. Element clusters of Focus grid for 90-99 achievement group.

Percentage of relationship among elements

a | b | c

52

64

88

94

17

18

13 15   14

12   11   16

3 7 |5   4   9 |1 2 8

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