Typographic Cueing ON SCREEN

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The effects of typographic cues, such as bold, underline, italic, capitals have been studied in print. The indications are that typographic cueing can improve the recall of material and this is most evident if recall immediately follows reading. This study investigates whether cueing on screen facilitates recall and introduces factors that have been explored when cueing content in printed material. A series of documents was read on screen followed by a set of multiple choice questions, which covered a range of question types. Cued material was either a phrase or sentence in red type, and these related to either main facts or incidental details. A control condition contained no red. Instruction regarding cueing was also varied.

We found a difference in overall recall between the cueing conditions, but no significant difference between the experimental conditions and the control. The difference was attributable to better recall of cued phrases than cued sentences. However, this difference was found only for incidental material. These results suggest that cueing a whole sentence containing detail can hinder overall recall, but cueing the specific detail is helpful.

Looking at answers to particular questions, we found an interaction between the instruction regarding the use of red and the type of question. For most questions performance was better without instruction regarding red type, but this was not the case for some questions. Telling participants that red highlights the answers to some of the questions helped them locate where an item came within the text, if red was used.

Overall, these findings provide no evidence that cueing is generally useful, despite the close relationship between some cued material and questions and explicit information on this relationship. Mixing questions on cued and non-cued material may remove any possible benefits of cueing.

INTRODUCTION

Typographic cueing provides a non-verbal way of guiding readers and focusing attention. By using typographic techniques (such as bold, underline, italics or color) to cue material, information designers can help readers to focus on material that requires the most attention. Most existing work has looked at the application of cueing to printed material, whereas this study explores typographic cueing on screen.

Glynn (1978) suggests that one of the assumptions underlying typographic cueing is that it works because of an isolation effect; by using cueing to set apart some information, the cued information is more likely to be noticed by readers. This is also referred to as making material perceptually more salient (Ausubel, Novak and Hanasian, 1978). But while there is wide agreement on why typographic cueing may be useful for readers, there are few guidelines discussing what cues are appropriate and little research to suggest how cues are best used (Beck, 1991).

The general consensus emerging from the literature is that typographic cueing can improve the recall of cued material. Foster (1979), in his overview of the cueing literature, argues that there is considerable evidence that typographic cueing can improve recall. Improved recall is demonstrated most frequently if it is tested immediately after reading (193). Foster's conclusion is echoed by Beck (1984, 1991) who notes that cueing generally helps readers to recall the cued information.

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PROPORTION OF CUED MATERIAL

While typographic cueing may generally improve the recall of cued material, some research suggests that excessive cueing may reverse any positive effects. Excessive cueing may make it difficult for readers to focus on important information.

Marks (1966) explored the quantity of material that should be cued through a study of children's reading of simple instructions. Marks found that cueing key words (by using bold or larger type) tended to improve performance, but cueing the entire set of instructions (through underlining) was detrimental to performance. Although Marks' study suggests that cueing key words rather than entire passages may improve readers' performance, it is not possible to draw this conclusion from the study because of the different cueing devices used. However, Marks does conclude that readers' attention can be focused by cueing only key words, while excessive cueing and 'indiscriminate underlining created an extremely crowded effect which militated against readability' (150).

The effects of the density of cueing was also noted by Crouse and Idstein (1972). They found that fairly dense cueing (with the answers to 22 questions underlined in a 210-word text) failed to improve readers' ability to answer the questions. Sparse cueing (with the answers to 30 questions underlined in a 6,000-word text) significantly improved readers' recall. This study suggests that having fewer cues in a text may encourage readers to pay attention to the cued material. However, as Foster (1979) notes, this study leaves unanswered the question of whether there is an optimal proportion for cued material (195).

Complex cueing, which is using different types of cues to highlight different types of content, may not bring any advantages to readers (Hershberger, 1964). Hershberger tested several types of cueing (including underlining, variations in type size and color) with school children and found that complex cueing failed to improve their learning. Although the complex cueing appeared to reduce the amount of 'enrichment content' (unimportant material) learned, it failed to facilitate children's learning of 'core content', i.e., the most important material. In a follow-up study, Hershberger and Terry (1965) concluded that, in contrast, simple cueing can help participants to learn more of the core content. Their simple cueing

involved using just one cue (red type) to distinguish core content from the enrichment content in black type.

TYPE OF CUED MATERIAL

Another concern for researchers, highlighted in Marks' (1966) study, is what type of material should be cued. Ausubel, Novak and Hanasian (1978) suggest that the effect of cueing is most pronounced when factual material, rather than abstract material, is cued. Readers may also be influenced by whether the cueing involves key words, key phrases, entire sentences or entire paragraphs. Marks concludes that cueing key words is most useful and that cueing entire passages creates problems for readers. But, as Foster (1979) notes, it is difficult to draw any conclusions about how much and what material should be cued because many studies do not specify how the cued material was chosen and because most studies of typographic cueing can not be compared. If the decision is made to cue the core content, identifying the most important sections can be criticized for being the subjective judgment of the research worker (194–195).

Foster (1979) also notes that relevant cues are most useful. In his study, Foster used capital letters to cue sentences within a passage of text. He used two cueing conditions: one condition cued sixteen sentences providing relevant core content, the other cued sixteen random sentences. Foster found that relevant cueing led to a greater recall of core content.

The relevance of cued information is likely to be linked to readers' trust about whether the cueing will be useful. Readers may make an initial judgment about the value of cues, and use this judgment to guide the attention that they give to all cues within a text. Fowler and Barker (1974) examined this question in their study of college students' recall of cued material. Fowler and Barker's experiment involved four conditions: some participants used a pen to actively highlight important information as they read, some read text highlighted by other students, some read text highlighted by the experimenter and some read text that was not highlighted. While Fowler and Barker found no reliable differences in participants' overall retention, they did find that highlighted material was significantly more likely to be remembered than non-highlighted material. In addition, they

found that the degree of improvement was influenced by the faith that participants had in the person who did the highlighting. Participants reading text that had been highlighted by the experimenter performed significantly better in recalling the highlighted material.

EFFECTS OF CUEING ON OTHER MATERIAL

Typographic cueing may generally improve readers' recall of the cued content, but there is some evidence that this improved recall may come at the expense of non-cued content. Cueing may not influence the total amount of material recalled from a text; instead, it may influence what material is recalled (Glynn, 1978).

This trade-off in what material is recalled is evident in Fowler and Barker's (1974) study. They found no significant difference in overall recall across the four conditions used in their experiment. However, they did find that the recall of cued material was significantly better for participants reading cued text.

Beck (1991) explored this question because of concerns raised in other studies that highlighting intentional information may be detrimental to the learning of incidental (non-cued) information. Beck's work did not support this concern. In a series of studies with school children, he found that cueing helped children to retain intentional information without affecting their retention of incidental information.

An earlier study by Cashen and Leicht (1970) with older students seems to make even stronger claims for the retention of non-cued material. Using multiple choice questions, they tested recall of material that was adjacent to the cued (underlined) statements. They found superior performance for both underlined statements and those adjacent, when compared with the control condition (no cueing). In this study, the authors speculate that improved recall may have been due to spending longer on cued material as there were no limits on the length of time spent reading. However, this speed-accuracy trade-off does not appear to be necessary for superior performance. Hershberger and Terry (1965) reported no difference in reading times of cued and uncued material, but an improvement in recall of important information, relative to unimportant. There was also no overall reduction in the amount recalled.

INSTRUCTIONS TO PARTICIPANTS

The value of cueing may be influenced by what participants are told about the cues used in a text. For example, participants may perform differently if they are told at the beginning of an experiment that cued material contains important information or if they are provided with training in processing cued material (Beck, 1984). The importance of participants' initial impressions of the value of cues is clearly evident in the experiment conducted by Fowler and Barker (1974).

Typographic cueing may be most effective if the information that is cued is also directly relevant to the information required for follow-up tests. Crouse and Idstein (1972) note that, when cueing directs learners to the information required for a follow-up test, cueing is likely to improve recall. In their study, Crouse and Idstein specifically told participants to study the cued material.

How participants are instructed was explored by Coles and Foster (1975) who also cued material that was directly relevant to the questions in a follow-up test. In their first experiment, Coles and Foster did not inform participants about the cueing; they found that while the participants in the cued condition performed numerically better than those in the non-cued condition, there was no significant difference between the two conditions. In a second experiment, Coles and Foster informed participants that the cued material was important. Contrary to their expectations, they again found a numerical improvement but no significant difference between the cued and non-cued conditions. In a third experiment, Coles and Foster gave more elaborate instructions and encouraged participants to adopt a specific reading strategy. This time, they found a significant difference caused by cueing when readers were instructed to use the reading strategy. They conclude that the effects of cueing will vary between texts and readers, and that the value of cues will depend on readers' faith in them.

PRINT VERSUS SCREEN

The research reviewed so far has investigated typographic cueing in print. Various researchers have pursued general comparisons of reading from paper and reading from screen (e.g., Gould, Alfaro, Barnes, Finn, Grischkowsky and Minuto, 1987; Hansen and Haas, 1988; Oborne and Holton, 1988; Jorna and Snyder, 1991; Muter and Maurutto, 1991; O'Hara and Sellen, 1997). A main finding has been that

reading from screen is significantly slower than reading from paper (Dillon, 1992). Rates that have been reported for reading from screen are 199 words per minute (Muter and Maurutto, 1991); 244 words per minute (Dyson and Haselgrove, 2000); 151 words per minute (Dyson and Haselgrove, 2001). Given the differences between individuals' reading rates, this degree of variation is not surprising. A further source of variation identified by Jackson and McClelland (1979) and found by Dyson and Haselgrove (2001) is the tendency for faster readers to have higher levels of recall.

Although research has looked at reading from screen, there appear to have been few attempts to explore how typographic cueing on screen may affect recall from passages of continuous text. An unpublished study (Backman, Lundberg, Nilsson and Ohlsson, 1984)[1] used red type to cue more important clauses, in contrast to white type on a blue background. This seemed to work better for good than poor readers, but the effect of red was still relatively weak. Ten years later, using the more sophisticated display of a Macintosh screen, Cory (1994) compared underlining and highlighting as cues to the most important sections of text. Unfortunately, the published article focuses solely on the other variable introduced into the study: the user's cognitive style.

[1] Summarized in an abstract by Rune Pettersson.

Color was once a primary means of typographic differentiation on screen, before it was possible to render different typefaces, type sizes, type styles etc. Consequently, articles from the 1980s address the use of color within systems in use at the time, i.e., teletext and viewdata (e.g., Reynolds, 1980; Bruce and Foster, 1982; Foster and Bruce, 1982; Backman et al., 1984; van Nes, 1986). Although color as a means of differentiating material was explored, this was generally as an aid to searching and retrieving information, rather than in the context of continuous reading.

The greater sophistication of current display technologies, and a significant increase in the amount of material that we can read from screen, particularly on the WWW, limit the generalizations which can be made from past research. However, color has been retained as a means of typographic cueing in web pages which frequently use color to indicate links or differentiate elements of text, such as headings.

RESEARCH QUESTIONS

This study explores whether typographic cueing on screen can aid recall, using red type as a simple cueing device. A comparison is made between the cueing of phrases and sentences. Based on the findings of Marks (1966) and Crouse and Idstein (1972), we would expect cueing less material (i.e., phrases) to produce better recall than denser cueing (i.e., sentences).

The type of material cued is also varied, comparing main facts and incidental details. We avoid subjectivity in selecting which material to cue by using documents and questions which were piloted for use in earlier experiments (Dyson and Haselgrove, 2000, 2001) where it was important to establish an objective basis for devising comprehension questions. The pilot identified the most important 'units' of documents, which provided a criterion for developing questions that addressed the main issues, as opposed to details. On the whole, we would expect questions testing recall of specific information to be answered less accurately than those that are more general, and based on more important units of text (Dyson and Haselgrove, 2000). Cueing may reinforce this difference, having equal effects on the two types of material. Alternatively, as there is more scope for improving the recall of details, differences between the two may be reduced by cueing.

The effect of cueing on recall of non-cued material is also explored in this study as questions address a range of types of material, other than the main facts and details (Dyson and Haselgrove, 2000, 2001).

Finally we vary instruction to see how this may affect the value of cueing (Coles and Foster, 1975).

METHOD

EXPERIMENTAL DESIGN

The experiment compared five cueing conditions: four with cued material and one that served as the control condition, i.e., no text was cued. Two conditions cued text that related to main facts, and the other two cued incidental material. In both cases one document cued phrases and the other cued sentences. All participants received the five cueing conditions (within subject variable), but half were given no prior indication that there would be cued material (no instruction)

and the other half were informed that the cued material highlighted answers to some of the questions (instruction).

The time taken to read each text was recorded together with recall scores based on multiple choice questions covering a range of types of material (see below).

All participants started with a practice document. Those who received no instruction regarding cueing received a document identical to the control condition, i.e., contained no cued material. The participants who were given instruction read a practice document which contained four instances of cued material: two phrases and two sentences (in each case with one referring to main factual and one incidental material). The design is summarized in table 1. The pairing of documents with cueing condition and the order of presentation was determined by a Greco-Latin square balanced design.

TABLE 1
Between and within subject variables

BETWEEN SUBJECT	USE OF INSTRUCTION	NO INSTRUCTION						INSTRUCTION					
WITHIN SUBJECT	CUEING CONDITION	No Cueing	No Cueing	Main Factual Phrases	Main Factual Sentences	Incidental Phrases	Incidental Sentences	Main Factual Phrases Main Factual Sentences Incidental Phrases Incidental Sentences	No Cueing	Main Factual Phrases	Main Factual Sentences	Incidental Phrases	Incidental Sentences
	DOCUMENTS	Practice	1	2	3	4	5	Practice	1	2	3	4	5

PARTICIPANTS

Thirty volunteers were recruited from within the Department of Typography & Graphic Communication at the University of Reading, UK. They were either undergraduate or postgraduate students.

A number of articles that were considered to be of general interest were selected from the magazine *National Geographic*. (Permission was obtained to use these articles.) The documents were edited to be approximately equal length (up to 1000 words) by deleting text from the end, ensuring that the story line remained intact.

Six types of questions were used which appeared to require either recall of specific information (detail or a main fact) and 'higher order' questions (McConkie, Rayner and Wilson, 1973), which required the reader to make inferences about what was read. Five of the six question types were written as multiple choice questions, with three alternative answers. The sixth type of question measured recognition of short extracts (a sentence or the first part of a sentence) from the document.

The questions requiring recall of main facts and incidental details were used to identify which material to cue. In the phrase conditions, the words appearing in the correct answer (within the multiple-choice alternatives) were cued. Where sentences were cued, these incorporated both the question and the correct answer. To maintain consistency across questions and documents, if a sentence incorporated some relevant material, the whole sentence was cued. This resulted in some variation in the number of words cued, but maintained a clear distinction between cueing phrases and sentences.

All question types were applied to each condition to gauge the effect of questions on non-cued material, as well as questions on cued material. There were three main factual (MF) and three incidental (I) questions for each document. There was also one title question (T) asking which of the alternative titles best fit the text; one main idea question (MI) covering one of the main ideas in the text; a structure question (S) asking about the order of items within the text, i.e., what came before or after a particular item; ten recognition questions (R) asking whether the extract had appeared in the text. Recognition questions consisted of ten short extracts, of which five were taken from the text that had been read, and five from the same source material, but from a part that had not been read. This ensured that the theme and writing style of the extracts were similar.

EQUIPMENT

A Compaq Prolinea 575 computer was used to present the experimental material on a Sony Multiscan 15sf color monitor with a video image area of 11.25" by 8.5" (14" maximum viewing image). This was set to a resolution of 800 x 600 pixels and 256 colors.

The text was displayed using Microsoft Word for Windows 7 in 10 point Verdana, a sans serif typeface designed for screen. Cued material was displayed in red type, with the remaining type in black on a white background. The interlinear spacing was 12 points with an additional 12 points between paragraphs. The line length averaged 55 characters per line. Figure 1 illustrates the layout of the screen.

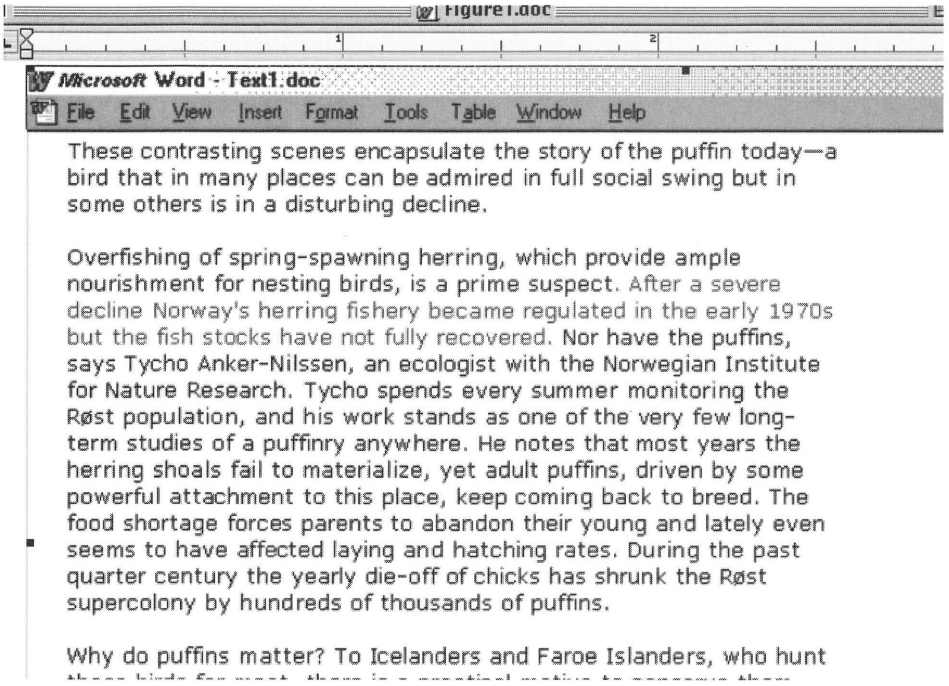


FIGURE 1
Screen layout showing a document with a cued sentence

PROCEDURE

Following initial briefing, a practice trial was given to familiarize participants with the type of questions they would be asked and ensure they knew how to move through documents and call up the next document. They were given the option to scroll through the document with the mouse or use cursor keys.

On completion of the practice trial participants were asked to silently read a series of five documents displayed on screen and the time taken to read each document was recorded.

Nine multiple-choice questions were asked about each document with three alternatives per question, which were answered without referring back to the document. The order of questions and order of alternative answers were randomized for each participant. These questions were immediately followed by ten recognition questions.

After these questions, participants were asked to rate their enjoyment in reading the text, based on the content. They were given a rating scale from 1 (did not enjoy at all) through to 5 (very enjoyable).

On completion of these tasks, participants were asked to fill in a short questionnaire to provide information on their use of computers and reading habits. This asked about their frequency of using computers, reading from screen, word processing and accessing the web (on a scale from 0: not at all to 5: very frequently).

Two further questions explored their attitudes regarding reading from screen, asking them to rate their dislike or enjoyment of reading from screen, and what they did if they found a web page that was of interest to them (e.g., skim and if useful or interesting print out, or read from screen).

RESULTS

SPEED OF READING

There were no statistically significant differences in reading speed across the five cueing conditions and no effect of giving instruction. The average rate was 200 words per minute.

OVERALL RECALL

Scores for recognition questions were adjusted as chance level of performance is 0·5 for these questions and 0·33 for the multiple choice (as three alternatives were available). The adjustment standardized chance level at 0·33 for all questions, so that scores became relative to their distance above or below chance. The answers to all questions were scored as a proportion and transformed (2 arcsin $\sqrt{}$) for statistical analysis. Where scores are a proportion of perfect performance there is a maximum limit and an angular transform is appropriate (Kirk, 1995). Following these adjustments and transformations, chance is equal to 1·57 and a perfect score 3·14 for all question types.

A two-way analysis of variance was carried out on the combined recall scores from the six types of questions with instruction as a between subject factor and cueing condition as a within subject factor. This found a main effect of cueing condition ($F(4,112)=2{\cdot}54$, $p<0.05$). There was no significant main effect of instruction and no interaction between cueing condition and instruction. The data are illustrated in figure 2, averaged across the two forms of instruction. The standard error bars on each data point give an indication of the variability between participants.

Differences among individual means were examined using linear contrasts as not all comparisons between the conditions needed to be tested (Howell, 1982, 276). No difference was found between the four experimental conditions (MFP, MFS, IP, IS) and the control (C) with no cueing suggesting that cueing has not improved overall recall in a simple manner. There was no significant difference between main factual and incidental recall (across phrases and sentences). Cueing of phrases produced significantly better recall than cueing sentences ($p<0{\cdot}025$) although this can be attributed to incidental material. Cueing incidental phrases was better than cueing the whole sentence ($p<0{\cdot}01$), but cueing main factual phrases did not significantly improve recall compared with cueing main factual sentences.

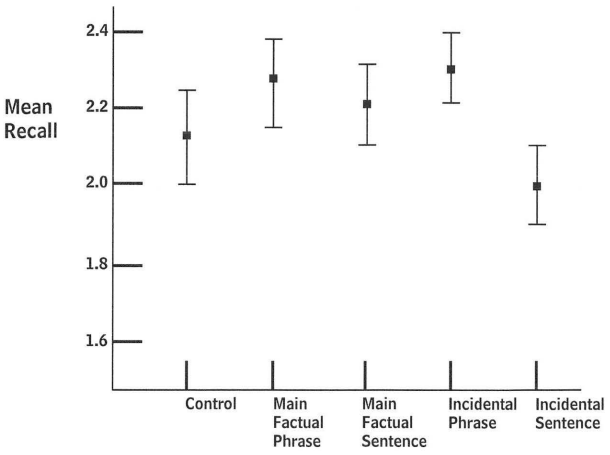


FIGURE 2
Mean recall scores across five cueing conditions.

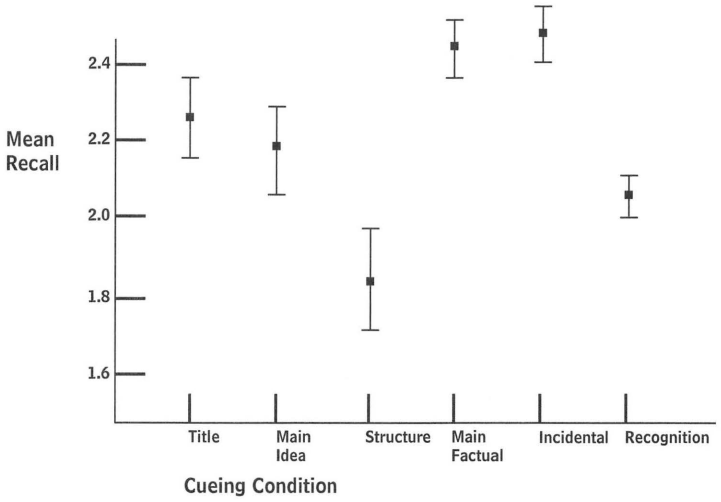


FIGURE 3
Mean recall scores across six question types. T: Title; MI: Main Idea; S: Structure; MF: Main Factual; I: Incidental; R: Recognition

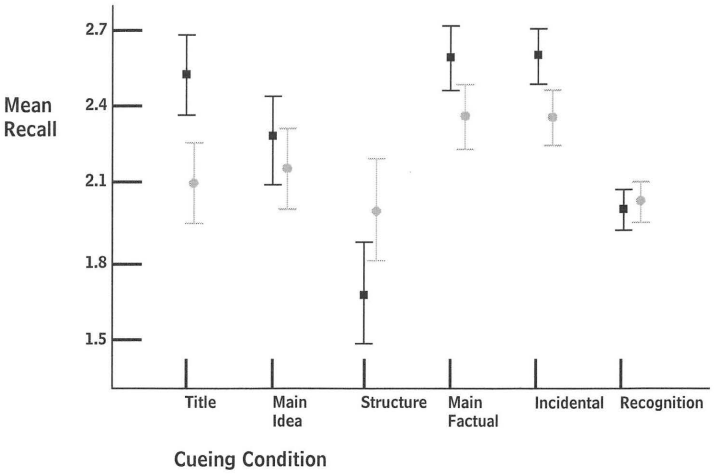
QUESTION TYPES

A second analysis of variance included question type (six levels) and found a significant main effect ($F(5,140)=8{\cdot}42$, $p<0{\cdot}0001$). There are differences in the level of recall depending on question type, which are illustrated in figure 3. Again using linear contrasts, main factual and incidental questions are answered better than all the others ($p<0{\cdot}01$), and there is no significant difference between the two. Structure questions are the most difficult and are significantly worse than all others ($p<0{\cdot}01$).

If the control condition is excluded from the analysis of variance to compare only the experimental conditions, there is a significant interaction between the instruction given to participants and the question type ($F(5,140)=2{\cdot}35$, $p<0{\cdot}05$). Figure 4 shows the recall scores for each type of question with and without instruction. Structure and recognition questions are different from the remaining questions when comparing instruction and no instruction ($p<0{\cdot}01$). When no instruction regarding the cueing is given, performance is superior on title, main idea, main factual and incidental questions, compared with giving instruction. In contrast, structure questions are answered better when instruction is provided, than when it is not; recognition questions are not affected by instruction.

FIGURE 4
Mean recall scores across six question types

■ without instruction
● with instruction



As answers to the structure question seem to be particularly difficult and to be affected in a different way by instruction, compared with other questions, this question type was further explored. Analysis of variance on the answers to this question across the five cueing conditions and two types of instruction produced a significant interaction between instruction and cueing condition ($F(4,112)=2{\cdot}88$, $p<0{\cdot}05$). The data are illustrated in figure 5. The difference between control conditions with and without instruction and experimental conditions with and without instruction is significant ($p<0{\cdot}025$). Instruction hinders participants in answering structure questions when there is no cueing, but has little effect, or helps, when there is cueing. The graph shows that the advantage of informing participants of cueing is associated with incidental material, rather than main factual.

READING PERFORMANCE, ENJOYMENT AND READING HABITS

Pearson's Product-Moment Correlations were computed between individual reading rates on each document, recall and participants' rating of their enjoyment in reading the text. There were no significant correlations so enjoyment did not relate to speed of reading or recall and speed of reading did not correlate with recall.

Correlations carried out to explore possible relationships between reported reading habits and performance (reading speed and recall) found no significant correlations.

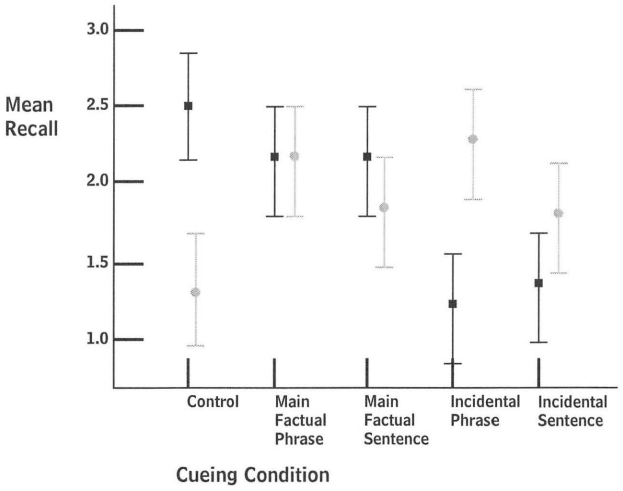


FIGURE 5
Mean recall scores for structure questions across five cueing conditions

- without instruction
- with instruction

However, the pattern of reading habits appears logical. Frequency of computer use correlates with frequency of screen reading ($R=0{\cdot}4$, $p<0{\cdot}05$), so those who report using computers more often also report reading from screen more often. Frequency of screen reading also correlates with enjoyment of screen reading ($R=0{\cdot}66$, $p<0{\cdot}0001$) and with what participants say they do with a web page that is of interest to them. Those who read from screen more frequently are more likely to read the web pages on screen, as opposed to skimming and then printing out.

DISCUSSION

The results provide no support for a general improvement in immediate recall of material read from screen that is cued in red. However, cueing of phrases produces better recall than cueing whole sentences, particularly when incidental details are cued. Therefore the suggestion reached by Marks (1966), that more discriminate use of cueing is preferable, may also apply to reading from screen. The confounding factor in the Marks study was removed in the current experiment which used the same cueing devices for both phrases and sentences.

This experiment, however, does not establish whether the advantages of cueing less material are due to identifying more specific items (with phrases) or simply cueing

fewer words. Cueing sentences increases the density of cueing (Crouse and Idstein, 1972), so that a greater proportion of material is cued. An alternative way to increase this proportion would be to cue a greater number of phrases, but this was outside the scope of the current study.

The larger difference in recall between incidental sentences and phrases, compared with main factual sentences and phrases, suggests that a greater density of cueing may not be a sufficient explanation for poorer recall. Both the amount and type of cued material seems to be relevant. A specific detail, unlike a main fact, may be conveyed in a few words and if the whole sentence is cued, identification of the detail may be obscured.

The lack of a difference between the recall of main factual and incidental material may be due to a ceiling effect in recalling more important information. This is the material that tends to be recalled more accurately without cueing (Dyson and Haselgrove, 2000, 2001). Cueing incidental details may have focused participants' attention on them and thereby improved their recall to the level of the more important units (main factual). This works more effectively when only phrases are cued.

In this study, there appears to be no adverse effect of cueing on the recall of non-cued material. Although the main factual and incidental questions are answered better than all other questions based on non-cued material, this is the case with or without cueing. There is no interaction between cueing condition and question type.

Introducing cueing also had no effect on reading speed, as reported by Hershberger and Terry (1965). The average reading rate falls within the range of other studies that have measured speed of reading from screen (Muter and Maurutto, 1991; Dyson and Haselgrove, 2000, 2001). There appears to be no trade-off between speed of reading and recall, nor a tendency for faster readers to have higher levels of recall (Dyson and Haselgrove, 2001).

Instructing participants that the cued material highlights answers to some of the questions does not improve overall recall. As with the Coles and Foster (1975) study, it may be necessary to go further than a simple instruction and suggest a

specific reading strategy. However, the introduction of instruction does interact with the type of question, suggesting some form of strategy may have been adopted.

Recognition questions are unaffected by instruction, perhaps because a rather different type of recall is being measured. Recognition questions do not require understanding of the text, but memory for specific wordings. As these particular extracts are not cued (and participants may have realized this as the experiment progressed) instructions regarding cueing, or even cueing itself, may be irrelevant. This is supported by very similar recognition scores across all five conditions.

The difficulty of structure questions is consistent with earlier studies (Dyson and Haselgrove, 2000, 2001) and in this experiment instruction differentially affects recall of structure depending on whether or not cueing is applied. Due to instruction, participants may have decided to use the sections in red type as reference points, thereby using the cueing to help locate items. The extremely poor recall (worse than chance) with no cueing, when instructed, may possibly be due to a reliance on the red, which is not available in the control condition. Participants were not informed that one document contained no cued material.

When cueing is applied to incidental material, especially phrases, informing participants of the relevance of the cueing to the follow-up tests may have increased their attention to what were otherwise seemingly unimportant details. These appear to have been used to improve the recall of the order of items (structure questions). Performance on incidental questions does not show a similar improvement with instruction, but the level of recall is generally much higher for these questions (with or without instruction).

Although this study has produced no clear evidence that typographic cueing on screen improves the recall of cued material, we cannot conclude that these results differ from those for print. The literature on cueing in print was used to inform and direct suitable hypotheses for testing on screen, and the experiment was not designed to compare the two forms of reading. The results suggest that further exploration of the use of cueing on screen would be useful, looking specifically at facilitating the location of items within a narrative, a particular problem when reading from screen (Dyson and Haselgrove, 2001).

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