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Evaluation of List vs. Paragraph Text Format on Search Time for Warning Symptoms in a Product Manual

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Abstract. Published research comparing different types of format in product manuals using performance measures is limited. As the availability of information mushrooms, the ways to best relay information to users has become increasingly important. Documentation designed to minimize search time while maximizing knowledge acquisition could benefit users. The present study examined the effect of two types of text format (list versus paragraph) with the same semantic context on the time to search and find a symptom of Toxic Shock Syndrome (TSS) in a diaphragm product manual. Total time to examine the overall manual and the specific page with the TSS symptoms were recorded. After this task, the manual was removed and participants were asked to write out as many TSS symptoms as they could remember. Results indicate that the arrangement of symptoms in a list format significantly decreased search time compared to paragraph format when viewing the symptoms page. No significant difference was found between the two formats for overall examination time of the manual or for the number of symptoms recalled. The results indicate that list format can benefit users seeking information that is embedded in other text.

1. Introduction

With the increasing links to computer networks and with a more literate society, the amount of information potentially available to people has dramatically increased. Mere exposure to textual information, however, does not necessarily mean that knowledge is seen and read. Most text is in a paragraph/prose-type format. It may be that this kind of formatting is not always the best structure to facilitate information search. Instead other types of formatting may better enable a search for information. Research on the formatting of text on computer displays indicates that information acquisition is assisted when the textual material is displayed in a list-type format as compared to paragraph format [1]. Other research suggests that information presented in list format facilitates the ease with which textual material is scanned [2]. One reason for the benefit of list format over paragraph format in information search tasks is that the former has a lower print density than the latter. Research indicates that text with greater print density increases search times [2].

Besides computer displays, research involving consumer product documentation suggests a list format to be beneficial compared to a paragraph format. Desaulniers [3] determined that product warnings in outline format were more likely to increase compliance compared to paragraph format. Also, participants judged text arranged in an outline-type format to be easier to process and to have greater eye appeal than text in a paragraph-type format.

While there is research suggesting that list format may be beneficial to users viewing computer-based material and product labels, the issue whether it is better than paragraph format in product manuals has not been addressed. While it might not be possible to format

an entire product manual into a list format, some types of information might be better arranged in a list structure to facilitate attention capture. Users' ability to acquire important information, e.g., concerning safety and health, might be aided when risk information is presented in a list-type format as opposed to a paragraph format. Many products have hidden risks that require warning information to prevent injury. Some of these products are medical devices used by consumers. Like many medical devices, diaphragms have risks. There are two main risks of diaphragm use. One is undesired pregnancy which becomes more likely when the device is used inappropriately. The other is Toxic Shock Syndrome (TSS), a rare but potentially lethal disease. Death can be forestalled if the disease is diagnosed in its early stages. However, the symptoms of TSS can mimic those of other illnesses, such as influenza. Therefore it is important for users and health professionals to recognize that the device could be a proximal cause of an illness yielding a range of symptoms so that proper treatments can be hastened. Therefore, information about the disease should be apparent in the printed materials supplied with the diaphragm.

The present research examines whether symptom information in a product manual is found faster when presented in list format compared to paragraph format with semantic content held constant.

2. Method

2.1 Participants

Twenty individuals ($M = 27.55$, $SD = 9.75$) from the Raleigh, North Carolina area were assigned randomly to one of two conditions (10 per group). Eleven of the participants (55%) were females.

2.2 Materials

A black and white photocopy of an Ortho® (Ortho-McNeil Pharmaceutical Corporation, Raritan, NJ) diaphragm product manual was used [4]. The manual is intended to be given to women fitted with this prescription-medical device by a health care professional. The manual contained 22 pages of text and illustrative diagrams. The original manual was entirely in paragraph prose format.

Two versions of the manual were used. Both were identical except the version used in paragraph-format condition had the TSS symptoms in the original paragraph format, as shown in Figure 1, whereas in the list format version the symptoms were presented in bulleted, list format, as shown in Figure 2. Certain portions of the manual were retyped in both conditions so that font type and size was identical for both manuals. In both manuals the manipulated section appeared in the same location as in the original manual, on page 17. The ordering of the symptoms was consistent across both conditions.

> Primary symptoms of TSS are sudden high fever (usually 102° or more), and vomiting, diarrhea, fainting, or near fainting when standing up, dizziness or rash that looks like a sunburn. There may also be other symptoms of TSS such as aching of muscles and joints, redness of the eyes, sore throat and weakness. If you have sudden high fever and one or more of the other symptoms, remove your diaphragm and consult your physician immediately. Women with a known or suspected history of TSS should not use the diaphragm.

Figure 1: TSS Symptoms in Paragraph Format

Primary symptoms of TSS are sudden high fever (usually 102° or more), and one or more of the following:

- vomiting
- diarrhea
- fainting, or near fainting when standing up
- dizziness
- rash that looks like a sunburn
- aching of muscles and joints
- redness of the eyes
- sore throat
- weakness

If you have sudden high fever and one or more of the other symptoms, remove your diaphragm and consult your physician immediately. Women with a known or suspected history of TSS should not use the diaphragm.

Figure 2: TSS Symptoms in List Format

Time to examine the entire manual and the symptoms page, in seconds, was recorded with two stopwatches.

2.3 Procedure

The testing consisted of two parts: (1) reading a scenario question and finding the answer in the manual and (2) free recall of TSS symptoms. Each participant was tested independently.

Each participant was given a gender-specific scenario (female is shown in Figure 3 and male in Figure 4) and question along with one of two versions of the manual. The participant was instructed to read the scenario and question and find the answer in the manual. Recording began when the participant opened the manual. Once the participant turned to the page in the manual with the TSS symptoms, the second timer was started. Both timers were stopped when the participant located the correct answer to the question. After finding the answer, the manual was removed, and the participant was asked to record as many TSS symptoms as he or she could remember.

An association has been reported between diaphragm use and Toxic Shock Syndrome (TSS). This is a serious condition that could be fatal.

You use a diaphragm. This morning you notice a sudden 102-degree fever and you feel faint when you stand up. Could this be a symptom of Toxic Shock Syndrome according to this manual?

Figure 3: Scenario and Question given to Females

An association has been reported between diaphragm use and Toxic Shock Syndrome (TSS). This is a serious condition that could be fatal.

Your female friend, relative, or significant other uses a diaphragm. She begins to complain to you about a sudden 102-degree fever and feelings of faintness when she stands up. She needs your help to figure out if this could be a symptom of Toxic Shock Syndrome. Is it or not according to this manual?

Figure 4: Scenario and Question given to Males

3. Results

The means and standard deviations for total-manual and warning-page readings times as a function of format (list vs. paragraph) are provided in Table 1. The means and standard deviations of the symptoms recalled as a function of format are provided in Table 2.

A Mann-Whitney U Test was performed to evaluate reading times as a function of format. No effect of format was found using the measure of the total time examining the manual, $U = 44.5, p > .05$. When participants started to examine the warning page, the time to answer the scenario question was significantly faster when the symptoms were presented in a list format compared to a paragraph format, $U = 1.00, p < .001$. No effect of format condition was found for the number of TSS symptoms recalled, $U = 31, p > .05$.

Table 1: Means and Standard Deviations of Examination Times by Format Type

	Examination Time (seconds)			
	Total Manual		Warning Page	
Format	*M*	*SD*	*M*	*SD*
List	66.15	51.07	6.72	2.46
Paragraph	48.61	12.64	16.88	8.02

Table 2: Means and Standard Deviations of Symptoms Recalled by Format Type

	Symptoms Recall	
Format	*M*	*SD*
List	3.30	0.67
Paragraph	2.90	1.29

4. Discussion

The results indicated that when participants began to look at the page of the manual containing the sought-after information about TSS symptoms, they were faster in answering the scenario question when the material was in list format than in the paragraph/prose format. There was no effect of format condition for total manual reading time, but this was possibly due to the vast majority of the manual being identical and individual participants varying considerably in how fast they looked through the pages of the complete manual. However, when the time was measured on the specific manipulated warning page there was much less variability, and hence there was more power to detect a difference in examination times between the manuals.

While there was a trend for the list format to produce greater symptom recall than the paragraph format in a subsequent memory test, the difference was not significant. Possible reasons for this result include (a) participants were looking for an answer for a particular question regarding a subset of symptoms and they did not focus on the non-relevant symptoms, and (b) the small sample sizes employed in this study limited statistical power. Additional investigation is necessary to determine if list format can aid incidental memory of task irrelevant items. Also, future research on text formatting should examine the extent to which the effect generalizes to other products and demographic groups. Research in other domains suggests that list format has utility in other domains [1 – 3] and with varied groups of participants [5].

In many cases, list format takes more surface space to present the same information compared to presentation in a paragraph format. A question unanswered in this research is whether list format will continue to show a search-performance benefit over paragraph format when surface area is held constant (e.g., reducing print size and line spacing in the list format version to match the footprint of the paragraph format version). Nevertheless in many instances, product manuals are not limited in space, and when the information is particularly important, such as hazard warnings, the extra space required to provide information in a list format probably should not be compromised.

References

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