PRIVACY POLICIES: CLOZE TEST REVEALS READABILITY CONCERNS

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ABSTRACT

Concern over technology capabilities versus individual privacy and recent changes in laws governing financial institutions are both driving forces related to the publication of privacy statements on many company websites. An important issue related to these policies, however, concerns consumers' ability to understand them. This paper reports the results of a study that tested the readability of four different companies' privacy statements, employing use of a web-based information system to automate the Cloze test for readability. Study findings revealed that a very small percentage of participants earned scores high enough to be considered able to read and comprehend the policies without additional assistance.

Keywords: privacy policies, readability, Cloze test, web-based Cloze tests

INTRODUCTION

Many companies have recognized consumers' concerns about their privacy in today's digital environment and have privacy statements posted on their web sites. The Gramm Leach-Bliley (GLB) Act specifically addresses banks and other financial institutions. The GLB regulations even offer strategies companies can apply to ensure their notices are written in a "clear and conspicuous" manner (4). To measure readability, companies may use tests such as the Flesch Reading Ease test available through Microsoft Word, or the Fog Index, another frequently used readability measure. While the Flesch and Fog tests measure difficulty, they may fall short in measuring how comprehensible a document is. Both measurements have some drawbacks as they are based largely on length of the sentences and the length of the words within the text. These scoring systems operate on the assumption that longer sentences are more difficult to comprehend than shorter ones.

Taylor (8) found the Cloze procedure a more reliable indicator of difficulty of written materials than standard formulas such as the Flesch Reading Ease or the Fog Index. As an alternative, the Cloze test provides a means to measure how "average" consumers actually understand key sections of written material. Within the business arena, the Cloze test has been used in numerous studies to measure understandability of such business-related materials as accounting statements (6) and narrative disclosures (1).

A standard application of the Cloze test requires selecting various sections of text in a document and replacing a selected pattern of words of the text with a blank for readers to fill in. The basic premise of the Cloze test is that, if the material is well written, the reader should be able to fill in the blanks based on the rest of the sentence (closure). Readers would have difficulty filling in the blanks in materials that are not written for understanding. Stevens, Stevens, and Stevens (7)

noted a score of 57% exact word replacements represents an independent reading level (able to read the material unaided) with 90% comprehension. Articles posted by the Privacy Rights Clearinghouse (5) also use a 60% to 100% exact word replacements necessary for understanding a document. In a readability study of employee benefit packages, Haar and Kossack (3) also used 60% as an acceptable level; however, after studying various companies' materials, they reported no package met or exceeded a 60% comprehensibility cutoff. Stevens, Stevens, and Stevens (7) and others who have studied readability issues also noted that a reader's prior knowledge is the key variable in comprehension. Based on a review of previous research, no single readability test is viewed as the definitive measure. The researchers elected to use the Cloze test because of earlier research suggesting its value in measuring how well readers comprehend materials.

STATEMENT OF THE PROBLEM AND STUDY METHODOLOGY

The principal question addressed in this study is how readable and understandable are privacy policies companies make available to consumers. Can consumers read them at a level that indicates they can comprehend the materials without additional assistance? Based on analysis of scores participants earn using a web-based information system to automate the Cloze test, how well do people actually comprehend privacy statements published by companies? The researchers also investigated the strength of correlations between Cloze scores and a number of variables such as age group, gender, previous knowledge of privacy statements, perceived importance of readable materials for consumers, and perceived level of difficulty of the Cloze test procedure.

Based on Flesch Reading Ease and Fog Index scores of privacy policies of Fortune Most Admired Companies and large financial institutions, the researchers selected policies from BellSouth, Fifth Third Bank, SouthTrust, and Wal-Mart. Students in selected freshman, sophomore, and junior-level classes served as the participants in this study. The authors of this study projected that students had not read many, if any privacy statements and that the test sample would approach the materials with a similar limited knowledge of content. The researchers designed a web-based information system to automate the Cloze testing procedure. The testing system is described in the section below. The researchers replicated a Cloze test procedure used in various earlier studies such as those by Adelberg (1), Bormuth (2), Stevens, Stevens and Raabe (6), and Taylor (8). The procedure requires passages set up to present the first sentence with no blanks to fill in; every sentence thereafter in the passage should have every fifth word blank for the participants to complete. The passage should be long enough to provide a minimum of 50 blanks to fill in. To gather feedback from students concerning the Cloze test exercises, the researchers also surveyed participants once they had completed the exercises.

THE WEB-BASED TESTING SYSTEM

We designed a web-based information system to automate the Cloze testing procedure. By electronically automating the testing procedure, we dramatically increase the ease with which the test is administered by removing time-consuming steps such as eliminating words from the passages, preparing paper copies of the tests, and grading the tests. The process also makes it easier for many computer-literate test takers by allowing them to type in their answers instead of

requiring them to write answers. Before test takers are allowed to participate in the testing procedure, three steps must be completed:

1. Cloze passages are entered into the system
2. Test takers are added to the system
3. Cloze passages are activated for test takers

Entering a Cloze passage is simply a matter of inputting a portion of the text from the document to be evaluated into the system (along with a passage title). Upon receiving the text, the system processes the passage by replacing every fifth word (after the first sentence) with a blank and by storing the replaced words as the correct answers for the passage. To ensure a minimum of 50 blanks for the test taker to fill in, the text contains at least 250 words after the first sentence.

In the second step, test takers are added to the system by an administrator, providing characteristics of each participant for later statistical analysis on test results. This provides the ability to know who has not yet completed the test and ensures that no one repeats a passage, thus biasing the individual's score. The system is designed so that the administrator adds a minimal set of information about each test taker—including at least a user name and password. Then, either the administrator or the test takers themselves (upon their first login) enter additional information describing the test taker—age, gender, etc. (Since our test takers were students in the first use of the system, the administrator loaded the data rather than placing the burden and responsibility of this step on the students.)

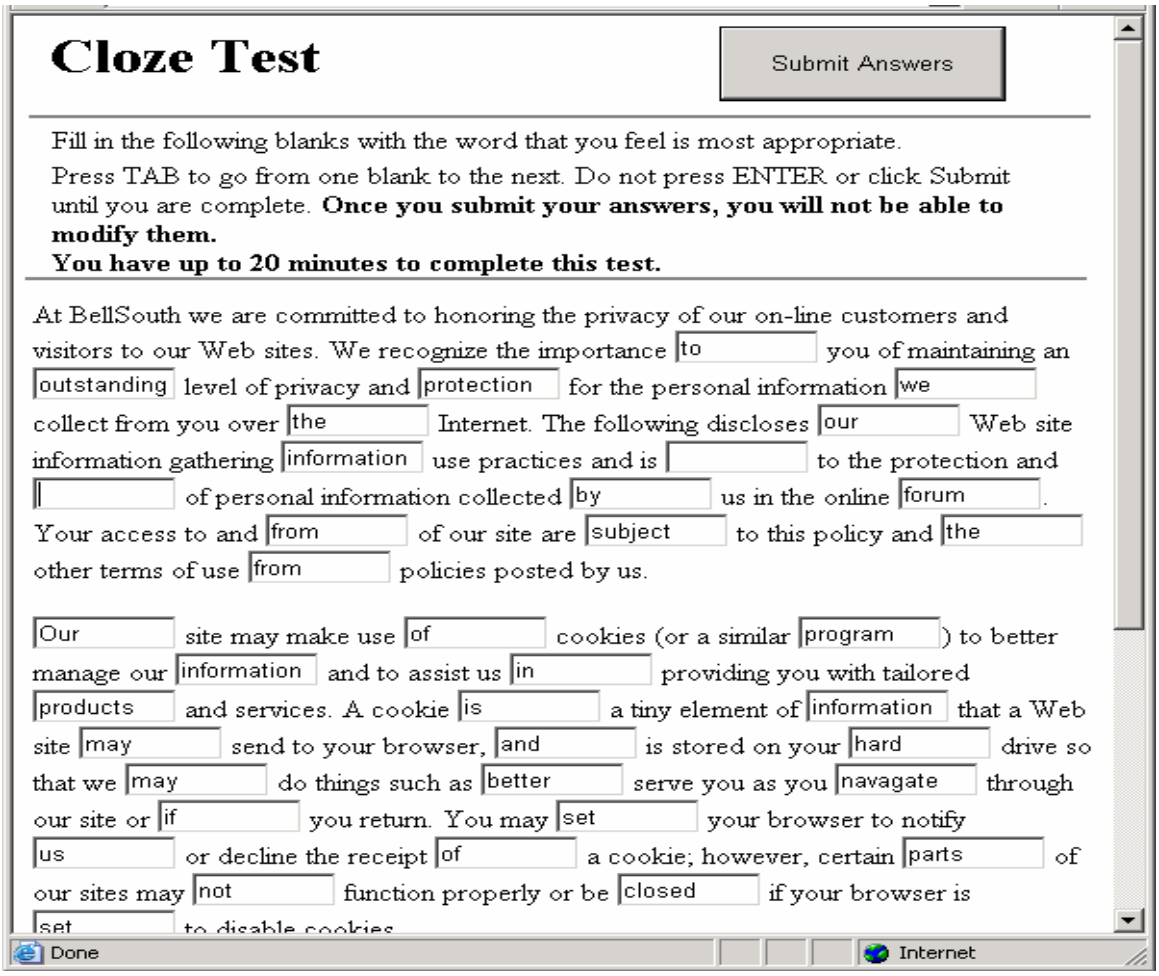
The third step of activating Cloze passages is provided to help ensure the security and usability of the system. Security is supported in that test takers can see the Cloze tests according to a specific time schedule and can only take a Cloze test on a particular passage once. To enhance usability, the system displays only the tests currently available to test takers, thus eliminating the need for a participant to search through a possibly lengthy list of tests to take at different times.

Once the three steps to set up the testing procedure are complete, test takers may log into the system to take the Cloze tests that are currently activated. After selecting a passage, a test taker completes two main stages. The first stage requires the user to fill in the blanks to complete the test. An example of the form used for this stage is shown in Figure 1. The example includes the basic form with the answers the participant provided prior to clicking on the "submit answers" button. Upon submission of their responses, the system determines the correctness of each answer by performing an exact string comparison between the test taker's answer and the correct answer. The Cloze score is calculated as the percentage of answers that are correct.

Test takers are ushered into a second stage once the automated grading procedure is completed. In this second stage, participants are given the option to correct any grading mistakes by identifying correct answers that are now listed as wrong. Viewing the passage with the correct answers (and their responses) gives the participants the satisfaction of knowing how their scores are derived—which answers are considered to be correct, which are not—as well as the satisfaction of knowing the correct answers for blanks that were a struggle in the previous stage. Participants can inform the system of responses that should be considered correct because of typographical errors, misspellings, or use of an acceptable synonym. After the participants

submit their evaluations of their responses, those they perceive are correct are flagged within the system and an updated Cloze score is calculated.

Figure 1



FINDINGS

Of the 102 participants who answered the survey, 5 had not completed any Cloze test. Those answering the survey were fairly evenly divided between males (51.5%) and females (48.5%). The majority of participants were between 18 and 24 years of age (79.6%). All other participants were 25 or older. Only 14% reported reading more than six privacy statements before participating in the Cloze tests; 44.6% reported having read no privacy statements prior to the tests. The majority of students spent an average of between 5-9 minutes (31.6%) or 10-14 minutes (36.7%) on a single company's passage. Over 90% of participants indicated they would prefer taking any future Cloze tests online versus paper-and-pencil method.

The Wal-Mart passage was considered the easiest to read by 64.6% of participants when asked the "easiest passage" question on the follow-up survey; 44.2% perceived Fifth Third the hardest passage. When questioned about overall reading ease of the privacy statement materials, 58.2% considered them somewhat difficult and 10.2% considered them very difficult. While 28.9%

perceived the Cloze test procedure easy to complete, 46.4% considered it to be of medium difficulty, and 24.7% considered it to be difficult. Based on the responses to the previous question, the researchers were not surprised to find that 68% reported the second phase of the test that allowed them to review and identify misspellings and synonyms to be of value. However, less than 40% of the student participants reported a high level of effort put forth in the exercise. Over 60% of participants perceived that it is of maximum importance that companies prepare readable/understandable materials when making documents available to consumers.

As the grouped bar chart (Figure 2 below) illustrates, very few students scored above 60% correct answers on any passage other than SouthTrust. Since the literature suggests that a minimum score of approximately 60% correct answers is needed to demonstrate that a reader can comprehend the material without assistance, this would indicate that none of the four passages was easily read/comprehended. Based on a previous research project, the SouthTrust and Wal-Mart passages were originally selected by the researchers as the two easier passages to read, based on their Flesch Reading Ease and Fog Index scores.

Figure 2

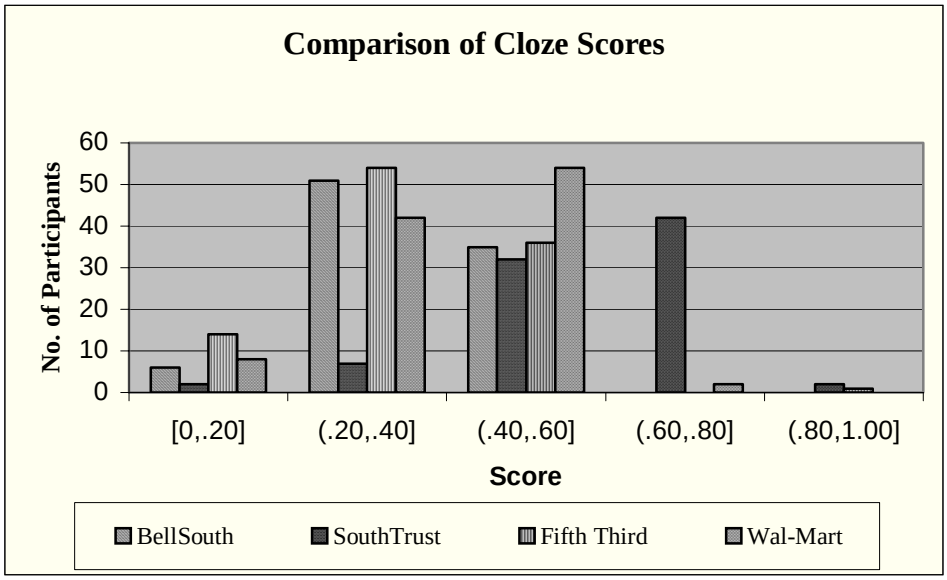


Table 1 lists statistics calculated based on the Cloze scores earned by participants for the various companies' privacy policies. By comparing each pair of Cloze score means using paired samples t-tests, we found statistical evidence (at a .05 significance level) for the rank order shown in the table. The SouthTrust passage emerged as the easiest to read of the four, with a mean difference of .18 between its Cloze passage when compared to Wal-Mart, which ranked second in ease of reading. Of particular note is the number of participants scoring over 60% correct answers on the SouthTrust passage in comparison to the other three passages. Although minimum scores are not presented below, The SouthTrust passage was also the only passage for which all participants got at least one answer correct.

Not all students completed the second phase of the Cloze tests in which they could identify misspellings and synonyms before obtaining an updated score. When the researchers checked the

actual second phase materials to verify the updated scores, many entries were disallowed because of unacceptable substitutions. Therefore, no full analysis of the updated scores is presented.

Table 1
Comparison of Company Cloze Passages

Rank	Company	N	Mean	Max.	Std. Dev.	N above 60%	95% Confidence Interval of the Meane	
							Lower	Upper
1	SouthTrust	87	.5837	82.46	.1467449	44	.552043	.615347
2	Wal-Mart	106	.3989	66.70	.1221990	2	.375320	.422390
3	BellSouth	92	.3678	55.17	.1068747	0	.345744	.390010
4	Fifth Third	105	.3507	94.23	.1409558	1	.323456	.378013

When Pearson Correlations were run between test scores and variables gathered through the survey, a few were significant at the .01 or .05 level. (See Table 2.) Cloze scores for all four companies were positively correlated with age grouping (older students more likely scored higher than younger students) and gender (females were more likely to score higher than males). Also positively correlated were Cloze passage scores and importance of readability of materials companies prepare for customers (those who perceived readability of company documents a more important issue were more likely to score higher). Yet another positive correlation was found between test scores and number of privacy statements previously read (those who had read some privacy statements prior to the test were more likely to score higher). Cloze scores were negatively correlated with perceived ease of reading the passages (those who perceived passages as harder to read scored lower) and participants' perception of difficulty of the Cloze procedure (those who identified the Cloze procedure as more difficult were more likely to score lower).

Table 2
Correlations

Cloze Scores	Variables					
	Age (18-24 or 25+)	Gender	Ease of reading statements	Importance of readability	Prior statements read	Difficulty of Cloze procedure
SouthTrust Score	.188	.317**	-.065	.214	.223*	-.359**
Wal-Mart Score	.280**	.141	-.049	.212*	.268**	-.256*
BellSouth Score	.142	.089	-.233*	.208	.146	-.257*
Fifth Third Score	.250*	.224*	-.015	.131	.216*	-.253*

* Significant at the .05 level ** Significant at the .01 level

CONCLUSIONS AND IMPLICATIONS FOR FURTHER RESEARCH

This study incorporated the use of a web-based information system to automate Cloze test procedures to measure level of readability of selected companies' privacy statements. Materials from BellSouth, Fifth Third, SouthTrust, and Wal-Mart were used in the study. Evaluating participants using the same levels as previous studies of the Cloze test, a large majority of participants scored less than 60% correct responses on the passages. They would, therefore, be labeled as *not* able to read and comprehend any of the four passages without assistance. Since the participants in this project were all undergraduate students, this would suggest that the privacy policy materials prepared by the four companies studied may not be easily read and comprehended by many consumers. However, because student participants self-reported that many did not put their full effort into the exercise, caution must be taken in drawing conclusions from the scores. Pearson Correlations revealed that older participants were more likely to score higher than younger participants, females were more likely to score higher than males, and those who had read privacy statements prior to the Cloze tests were more likely to score higher.

The results of this study suggest that the participants could not read and comprehend the materials without assistance. Further research is needed to validate these findings. Further research studies are also planned with software and hardware documentation materials, including software training materials; various accounting documents; human resource management documents; and other types of business documents. Findings from this current study and future related studies can be of value to technical writers, textbook publishers, and others who prepare materials the general public may be required to read.

REFERENCES

1. Adelberg, A.H. (1979, Summer). Narrative disclosures contained in financial reports: Means of communication or manipulation? *Accounting and Business Research, 179-89.*
2. Bormuth, J. (1965). Optimum sample size and Cloze test length in readability measurement. *Journal of Educational Measurement,* 2, 111-116.
3. Haar, J., & Kossack, S. (1990). Employee benefit packages: How understandable are they? *The Journal of Business Communication,* 27(2), 185-200.
4. Hochhauser, M. (2001). Lost in the fine print: Readability of financial privacy notices. Retrieved February 2, 2004, from http://www.privacyrights.org/ar/GLB-Reading.htm
5. Privacy Rights Clearinghouse Fact Sheet #24b Cloze Readability Test. Retrieved 2/2/04 from http://www.privacyrights.org/fs/fs24b-ClizeFinancial.htm.
6. Stevens, W.P., Stevens, K.C., and Raabe, W.A. (1983) Communication in accounting: Readability of FASB statements," *Review of Business and Economics Research,* 110-18.
7. Stevens, K.T., Stevens, K.C., and Stevens, W.P. (1992). Measuring the readability of business writing: The Cloze procedure versus readability formulas. *The Journal of Business Communication, 29(4), 367-382*
8. Taylor, W. (1953). Cloze procedure: A new tool for measuring readability. *Journalism Quarterly,* 30, 415-433.