

On the Reading of Product Owner's Manuals: Perceptions and Product Complexity

Brad Mehlenbacher
Technical Communication/English Department
North Carolina State University
Raleigh, NC 27695-8105
Brad_m@unity.ncsu.edu

Michael S. Wogalter
Psychology Department
North Carolina State University
Raleigh, NC 27695-7801
Wogalter@NCSU.edu

Kenneth R. Laughery
Psychology Department
Rice University
Houston, TX 77005
Laughery@ruf.rice.edu

ABSTRACT

This research focuses on the self-reported use of owner's manuals for automotive vehicles. The results indicate that owner's manuals are frequently not read. Nevertheless, people prefer owner's manuals to electronic presentations of the same product information. Implications for facilitating reader use of product documentation are discussed.

INTRODUCTION

Most consumer products come with some form of documentation such as an owner's manual, instructional sheets, and labels. Frequently, these materials contain warnings about potential hazards. To ensure safety and health, people often need to gain necessary information from accompanying documentation, yet some research suggests that people may not read this material (Rettig, 1991; Schriver, 1997).

For some products such as automobile, computer-related, and electronic products, the documentation can very extensive (e.g., getting started guides, user's guides, reference manuals, troubleshooting guides, online help systems, tutorials, electronic performance support systems, and so on). Research suggests that when people believe that they are familiar with a product they are less likely to read the documentation and warnings (Wogalter, Godfrey, Fontennelle, Desaulniers, Rothstein, & Laughery, 1987; Wright, Creighton, & Threlfall, 1982). However, despite this belief, people may not be knowledgeable about many aspects of products such as the hazards involved in their use.

Manufacturers may be assuming that people read the entire manual when some people read only parts or do not open it at all. Leonard and Karnes (2000), for example, found that only 6.8 percent of 221 survey respondents claimed to have read all of their vehicle owner's manuals. Still, one very basic issue that needs to be addressed is whether people read the documentation at all (Redish, 1993).

While there has been considerable research in recent years on warnings by Human Factors researchers, most of it has been conducted on on-product labels and environmental signs. Concurrently, the field of technical communication has grown substantially during last 20 years (Rainey, 1999). Research on the design and use of computer documentation has increased (Bethke, Dean, Kaiser, Ort, & Pessin, 1981; Brockmann, 1992; Carroll, 1998) in addition to studies of the similarities and differences between hardcopy and online documentation systems (Duffy, Palmer, & Mehlenbacher, 1993; Tomasi & Mehlenbacher, 1999). However, relatively few studies have given emphasis to the use of hardcopy documents

designed for technological products and tools (except, e.g., Ummelen, 1997; Vigilante & Wogalter, 1997; Wogalter, Vigilante, & Baneth, 1998; Young & Wogalter, 1990).

Our study focused primarily on the reading of owner's manuals for automobiles. We asked participants if had they read the owner's manual for the vehicle that they drive most often. We appreciated that the term, "read," can have different meanings for different audiences. Numerous researchers (Mehlenbacher, in press; Redish, 1988; Redish, Battison, & Gold, 1985; Sticht, 1985) make strong distinctions between reading to learn and reading to do, arguing that most people read documentation to do, that is, to accomplish tasks. Mehlenbacher, Miller, Covington, and Larsen (2000) speculate that many other reading goals can occur, including for example, reading to learn to do, reading to analyze, reading to compare, confirm, or correct, and reading to summarize. Moreover, course instructors commonly experience instances where students claim to have read and studied assigned materials, yet received a failing grade on the exam.

Given this proviso, people were asked how much they read of their owner's manuals. We asked people to report how much they typically read by candidly recalling how much time they spend browsing, searching, scanning, and using information from their owner's manuals.

In addition, our study examined the extent to which people would prefer various instructional technologies relative to hardcopy owner's manuals. Do people believe that alternative media presentations of product information (e.g., video, CD/DVD) are preferable or more useful than conventional hardcopy documentation?

METHOD

Participants

Three-hundred eighty individuals participated. Fifteen were dropped from the analysis because of incomplete data. Sixty-one percent were males ($N = 222$). Fifteen percent were non-Caucasians. Two-hundred forty-two were undergraduate students at North Carolina State University (mean age = 21.1, $SD = 3.5$), and 123 were non-students from various parts of North Carolina (mean age = 34.5, $SD = 14.16$). The non-students reported having an average of 15.1 years of education ($SD = 2.1$).

Materials and Procedure

The focus of concern in the present study was a subset of items from a larger questionnaire concerning various automobile-related topics. The survey elicited basic demographic information (e.g., regarding age, sex, education), and requested information about the vehicle that respondents drove most frequently. In reference to this vehicle, users were asked, "Have you read the owner's manual for this vehicle?" The responses were coded as no (0) and yes (1). If they answered yes, they were then asked to "estimate how *much* of the owner's manual you have read?" Participants responded by circling a percentage value on a horizontal scale from 0% to 100% in increments of 10%. The scale was anchored with the terms "none of it" at 0%, "about half of it" at 50%, and "all of it" at 100%.

Another section of the survey contained the following statements:

Recent technology has provided the potential for manufacturers to present information in new ways beyond the usual paper-based methods (such as an owner's manual). For example, the contents of an owner's manual could be presented on videotape. For each of the following items, please give a 0 to 8 rating using the scale below to answer the question:

How much would you *prefer* receiving product-related information concerning its features, maintenance, repair, warnings, etc., through the following kinds of media? The specific items were:

- (a) Direct instruction from a live person
- (b) Directly attached to the product
- (c) On the World Wide Web (WWW)
- (d) On videocassette
- (e) In an owner's manual
- (f) On CD/DVD

A 9-point Likert-type preference scale appeared below the items and contained the following word anchors together with the even-numbered ratings: (0) do not prefer at all, (2) somewhat prefer, (4) prefer, (6) very much prefer, and (8) extremely prefer.

RESULTS

Reading the Owner's Manual

Across all persons ($N = 365$), 89 percent of the participants stated that they owned a vehicle. Of the others who did not own a vehicle, 80% stated that they had access to one. 58.9% reported that they had read the owner's manual of the vehicle that they drive most often. Of those who stated that they read the manual, the mean percentage of the manual (reportedly) read was 52.7% ($SD = 27.8$).

Analyses were conducted to examine differences of reported manual reading between demographic levels. A median split of age at 22 years produced nearly equal groups of young versus older participants. More of the older participants (65%) reported having read the owner's manual than the younger participants (53%), $X^2 = 5.87$, $p < .05$; however, those who read the manuals, the amount read did not differ significantly between the two groups. There was no sex difference between those who reported reading the manual and those who did not, but of those who reported having read the manual, males reported having read more of it (57%) than females (45%), $p < .01$. Non-students (67%) reported having read the manual more than students (55%), $X^2 = 4.62$, $p < .05$. Furthermore, non-students who read the manual reported reading more of it (59%) than students (49%).

Instructional Technologies

Preferences for alternative instructional technologies presenting product instructions and warnings were analyzed using a repeated measures analysis of variance (ANOVA); it showed a significant effect, $F(5, 1820) = 55.2$, $p < .0001$. The means in Table 1 show high-to-low preferences as follows: owner's manual, attached to the product, WWW, Live, CD/DVD, and video. Comparisons among the means using Tukey's Honesty Significant Difference (HSD) test showed that all differences were significant except between CD/DVD and live presentation.

Demographic factors (sex, age group, student versus non-student, and readers versus non-readers of their vehicle's owner's manual) were added separately to an ANOVA containing instructional technology preferences to produce a series of mixed-model designs. Sex did not produce a main effect but produced a significant interaction with instructional technologies, $F(5,$

1815) = 2.28, $p < .05$. Simple effects analysis revealed that the only sex difference in preferred instructional technology was for CD/DVD, with males ($M = 3.81$) preferring this medium more than females ($M = 3.18$). There were no significant main effects or interactions involving age group and student versus non-student categories in the ANOVA model described above.

An ANOVA that included a grouping factor according to whether they reportedly read their vehicle's owner's manual showed both a significant main effect, $F(1, 363) = 8.69$, $p < .01$, and an interaction with instructional technologies, $F(5, 1815) = 7.79$, $p < .0001$. In general, individuals who reported reading the owner's manual gave higher ratings to the instructional technologies ($M = 4.19$) than those who reported not reading the manual ($M = 3.82$). The interaction means showed that the general technology-preference pattern shown in Table 1 held by both readers and non-readers of their owner's manual, except owner's manual readers preferred the owner's manual ($M = 6.12$) and CD/DVD ($M = 3.80$) more than the non-readers did ($M_s = 4.47$ and 3.23, respectively, $p_s < .05$).

Table 1

Mean preferences (and standard deviations) for instructional technologies.

Instructional Technologies	Mean	SD
Owner's manual	5.44	2.21
Attached to product	4.61	2.40
WWW	4.17	2.44
CD/DVD	3.56	2.45
Live	3.53	2.74
Video	2.90	2.41

DISCUSSION

Most studies of manual use force users to interact directly with certain types of product manuals (e.g., Ummelen, 1997) rather than asking them if they would use them for products they already own. The results showed that about 41 percent of our respondents reported that they did not read the owner's manual of the vehicle that they drive most often. Of those who reported that they read their owner's manual, the mean percentage reported was about 50 percent.

Importantly, only 11 participants (5.2%) claimed to have read 90-100 percent of their manual (cf., Leonard & Karnes, 2000). Clearly then, many people are operating vehicles without taking the time to familiarize themselves with the documentation that accompanies the vehicle, a finding that supports Redish, Battison, and Gold's (1985) assertion that, "If ... owners read the [manual] at all, they are likely to skim through it when they first get it. After that, they will probably only go back to it when they need a specific piece of information (p. 135).

Our findings complement those of Leonard and Karnes (2000) who found that, of 221 participants surveyed, only 6.8 percent claimed to have read all of their vehicle owner's manual and 6.3 percent read none of their owner's manual. Notably, 62.4 percent of Leonard and Karnes's (2000) participants claimed to have read "special topics" in their owner's manuals, and this finding is supported by Carroll (1998) and Schriver's (1997) research on manual use.

Given that some people are not reading some (and few are reading all) of their owner's manuals, the issue of how much they would prefer alternative formats such as VCR-based and via the WWW was examined. Hardcopy owner's manuals were most favored, followed by an attachment and then followed by electronic methods. Interestingly, most households have television VCRs, yet the respondents preferred this medium the least. In some respects, this finding might be explained in terms of familiarity: people are familiar with using paper-based materials. New users of alternative media are often presented with new challenges in terms of search mechanisms (Barnett, 1998), navigation (Zimmerman, Tipton, Bilsing, & Green, 1993), and physical and rhetorical differences between hardcopy books and online systems (Selber, Johnson-Eilola, & Mehlenbacher, 1997; Spyridakis & Isakson, 1991). Another issue in how much people are likely to read hardcopy documentation or information presented via alternative media appears to be that people more likely to read the one type seem more likely to use the other; that is, our results suggested a relationship between reading hardcopy manuals and using alternative media.

Finally, given the supplemental nature of the information contained in vehicle owner's manuals, manufacturers should consider attaching important warning and safety information directly on the vehicle. When a complete description cannot be placed on the product, manufacturers

should refer people to the owner's manual.

FUTURE RESEARCH

The present study explored several aspects related to user preferences in terms of user manual use for automobiles. The results showed that for vehicles only about 60 percent of our participants reported that they read their owner's manuals at all and, of that group, the majority of participants read only an average of fifty percent of the documentation that accompanied products that they purchase. Very few participants (5.2%) claimed to have read 90 percent or more of their product manuals.

In general these findings are consistent with Brockmann's (1992) argument that most adult learners

- Are impatient ... and want to get started quickly on something productive
- Skip around in manuals ... and rarely read them fully
- Are discouraged by large manuals. (p. 113).

Manufacturers often give short shrift to documents accompanying products, yet they probably know that the same documentation contains information critical to their products' use and safety. If a manual is critical to a product's use, then manufacturers ought to begin examining and evaluating the utility of information they send with their products. Future research should focus on the perceived reading habits of people using products other than automobiles, using products that range in technological complexity, familiarity, and perceived hazardousness.

REFERENCES

- Bethke, F., Dean, P., Kaiser, E. Ort, E., & Pessin, F. (1981). Improving the usability of programming publications. *IBM Systems Journal*, 20, 306-320.
- Brockmann, R. (1992). *Writing Better Computer User Documentation: From Paper to Online*, 2nd ed. New York: John Wiley & Sons.
- Carroll, J. M. (Ed.). (1998). *Minimalism Beyond the Nurnberg Funnel*. Cambridge, MA: MIT P.
- Duffy, T. M., Palmer, J. E., and Mehlenbacher, B. (1993). *Online Help: Design and Evaluation*. Norwood, NJ: Ablex.
- Leonard, S. D., & Karnes, E. W. (2000). Compatibility of Safety and Comfort in Vehicles. *Proceedings of the IEA/HFES 2000*

- Congress, 357-360.
- Mehlenbacher, B. (in press). Documentation: Not yet implemented but coming soon! In A. Sears & J. Jacko (Eds.), *Handbook of Human-Computer Interaction*. Mahwah, NJ: Lawrence Erlbaum.
- Mehlenbacher, B., Miller, C. R., Covington, D., & Larsen, J. (2000). Active and interactive learning online: A comparison of Web-based and conventional writing classes. *IEEE Transactions on Professional Communication*, 43, 166-184.
- Rainey, K. T. (1999). Doctoral research in technical, scientific, and business communication, 1989-1998. *Technical Communication*, 46, 501-531.
- Redish, J. C. (1988). Reading to learn to do. *The Technical Writing Teacher*, 15, 223-233.
- Redish, J. C. (1993). Understanding readers. In C. M. Barnum & S. Carliner (Eds.), *Techniques for Technical Communication* (pp. 14-41). New York: Macmillan.
- Redish, J. C., Battison, R., & Gold, E. (1985). Making written information accessible to readers. In L. Odell & D. Goswami (Eds.), *Writing in Nonacademic Settings*. (pp. 129-153). New York: Guilford Press.
- Rettig, M. (1991). Nobody reads documentation. *Communications of the ACM*, 34 (7), 19-24.
- Schraver, K. A. (1997). *Dynamics in Document Design: Creating Texts for Readers*. New York: John Wiley & Sons.
- Spyridakis, J. H., & Isakson, C. S. (1991). Hypertext: A New Tool and Its Effect on Audience Comprehension. *Proceedings of the International Professional Communication Conference*. New York: Institute of Electrical and Electronics Engineers, 81-85.
- Sticht, T. (1985). Understanding readers and their uses of text. In T. M. Duffy & R. Waller (Eds.), *Designing Usable Texts* (pp. 315-340). Orlando, FL: Academic Press.
- Tomasi, M. D., & Mehlenbacher, B. (1999). Re-engineering online documentation: Designing examples-based online support systems. *Technical Communication*, 46 (1), 55-66.
- Wogalter, M. S., Godfrey, S. S., Fontenelle, G. A., Desaulniers, D. R., Rothstein, P., & Laughery, K. R. (1987). Effectiveness of warnings. *Human Factors*, 29, 599-612.
- Ummelen, N. (1997). *Procedural and Declarative Information in Software Manuals: Effects on Information Use, Task Performance and Knowledge*. Amsterdam: Rodopi.
- Vigilante Jr., W. J., & Wogalter, M. S. (1997). On the prioritization of safety warnings in product manuals. *International Journal of Industrial Ergonomics*, 20, 277-285.
- Wogalter, M. S., Vigilante, W. J., & Baneth, R. C. (1998). Availability of operator manuals for used consumer products. *Applied Ergonomics*, 29, 193-200.
- Wright, P., Creighton, P. & Threlfall, S. M. (1982). Some factors determining when instructions will be read. *Ergonomics*, 25, 225-227.
- Young, S. L., & Wogalter, M. S. (1990). Comprehension and memory of instruction manual warnings: Conspicuous print and pictorial icons. *Human Factors*, 32, 637-649.