DIFFERENCES BETWEEN DESIGNERS' AND USERS' PERCEPTION OF INSTRUCTIONS DESIGN

Dorotea KOVAČEVIĆ, Maja BROZOVIĆ

University of Zagreb, Faculty of Graphic Arts, Getaldićeva 2, 10000 Zagreb, Croatia

ABSTRACT: *Although professional designers are trained to create appealing visualizations, their perception of attractiveness does not necessarily have to match users' perception. This study investigated the disagreement between those who design instructions and those who use them. We manipulated different samples of instructions designs to test their attractiveness by two groups: professional graphic designers and laypeople. Attractiveness was measured by Likert scale responses. The results indicated that two groups evaluated instructions differently. While designers preferred linear and simple instructions design, laypeople were attracted by the colourful designs made of planes. Implications for creating visually appealing instructions were discussed.*

Keywords: Instructions, attractiveness, designer, user.

1 INTRODUCTION

Large amount of consumer products comes with instructions for use, whether printed on the packaging or as inserted leaflet. Information provided by these instructions enhances the effectiveness of handling the product and, consequently, increases users' satisfaction. Although graphic presentation of instructions should encourage unhindered information processing, unfortunately, it happens that these messages sometimes fail to communicate relevant messages due to poor legibility or design-related features. Visual attractiveness of instructions design is important. Making instructions aesthetically appealing increases the possibility that users will pay attention to them. Even more, attractive design can play significant role in evoking positive impressions about the product (Magnier, 2016; Wang, 2013).

By deliberate application of design principles, experts are able to make aesthetically pleasing and easy to follow instructions (Agrawala, 2003). Professional graphic designers are trained to create visually appealing graphic presentations that are legible and easy to interpret. However, their process of designing is often guided by their own preferences. This is not surprising, since every kind of graphical presentation depends not only on the characteristics of presented information and the audience, but also on the presenter's objectives and her or his preferences, as reported by Tractinsky and Meyer (1999). Thus, it is likely that designers' perception of attractiveness does not necessarily have to match users' perception of attractiveness. Quispel and Maes (2014) demonstrated this in their study of data visualizations. Some other studies also showed discrepancy between designers' and users' perception. For example, Hsu et al. (2000) investigated the differences between designers and users in perceiving telephone design. Their results showed that designers prefer elegant style, while users appreciate modern design. In the study of Vogt and Magnussen (2007), different pictures were viewed by two groups of participants – artists and artistically untrained people. The results indicated two groups used different viewing patterns, which suggests that experience in art (or design) affects the way observer perceive visual messages. Another study of Bonnardel et al. (2011) also demonstrated some differences between designers of websites and users. This motivated us to investigate the possible disagreement between those who design instructions and those who consult the instructions.

2 EXPERIMENTAL

Our investigation included two types of participants' responses. One part of experiment was subjective evaluation of different samples of instructions design. Another part was reporting the design features mentioned by the participants while describing each of the instructions designs.

2.1 Participants

40 volunteers participated in the study. Their ages ranged from 21 to 41 years of age (M = 28.983, SD = 6.02). 65% of the participants were female and 35% were male. One group consisted of 20 professional graphic designers while another group included 20 laypeople without any kind of design experience. The selection criteria for choosing designers required that participants have formal design education and have at least one experience with the design of instructions.

2.2 Samples

We used four different samples of instructions to test their attractiveness by the two groups of participants. Tested instructions differed according to two factors: graphical elements and a theme. Both factors varied at two levels. Graphical elements used for the instructions design were whether lines (linear design) or planes (flat design). Themes referred to the type of consumer product: pasta or cleaning spray. Samples of instructions are shown on Figure 1.
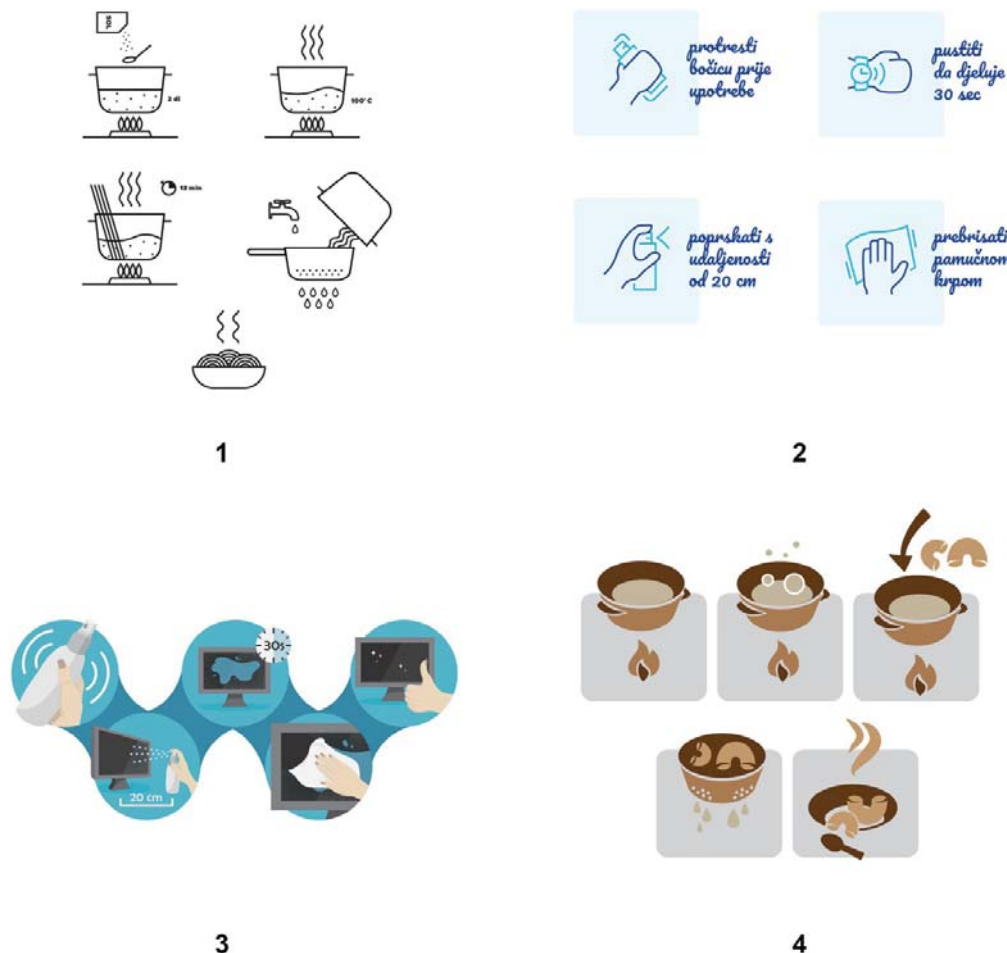

Figure 1. Designs of instructions used as stimuli: 1 – linear/pasta,
2 – linear/spray, 3 – flat/spray, 4 – flat/pasta.

2.3 Procedure

The experiment was conducted in a laboratory cabinet to ensure constant viewing conditions across the participants. Each of the participants evaluated the samples individually. Samples were presented one by one. The presentation time was not time-limited. The samples of instructions were presented on screen, on Lenovo computer display (model LEN L1900pA) with the viewing distance of 60 (+/−1) cm. Using 7-point Likert scale (7 = very attractive, 1 = unattractive), participants evaluated the attractiveness of each instructions design. This type of evaluation is commonly used in testing the attractiveness (Barlow, 1991; Monk, 2007). Participants were also encouraged to mention which design features made instructions especially attractive or unattractive. The experimenter recorded the answers and later categorised them in a table.

3   RESULTS

Although designs with planes were rated as slightly worse (M = 5.26, SD = 1.49) than liner design (M = 5.33, SD = 1.09), the repeated-measures ANOVA analysis showed no significant difference among two structural elements, $F(1,79) = 0.10$, $p = 0.75$. The repeated-measures ANOVA analysis with respect to theme of instructions found no significant difference between instructions for preparing pasta and instructions for using a cleaning spray $F(1,79) = 0.89$, $p = 0.35$.

A paired t-test showed that the two groups of participants rated instructions designs differently $t(79) = 2.64$, $p < 0.01$. The mean rate given by the group of non-designers was M = 5.60, SD = 1.15, while the designers were more critical with the mean rate M = 4.98, SD = 1.38.

Group means and standard deviations of participants' rates are shown in Figure 2. The group mean results indicate that designers evaluated linear instructions for spray as the best design (M = 6.00, SD = 0.1.12), while non-designers preferred planar design of instruction for pasta (M = 6.50, SD = 0.76).

Table 1 summarizes the design features mentioned by the participants during the evaluation process. Each feature is put in the tables only if mentioned more than twice.
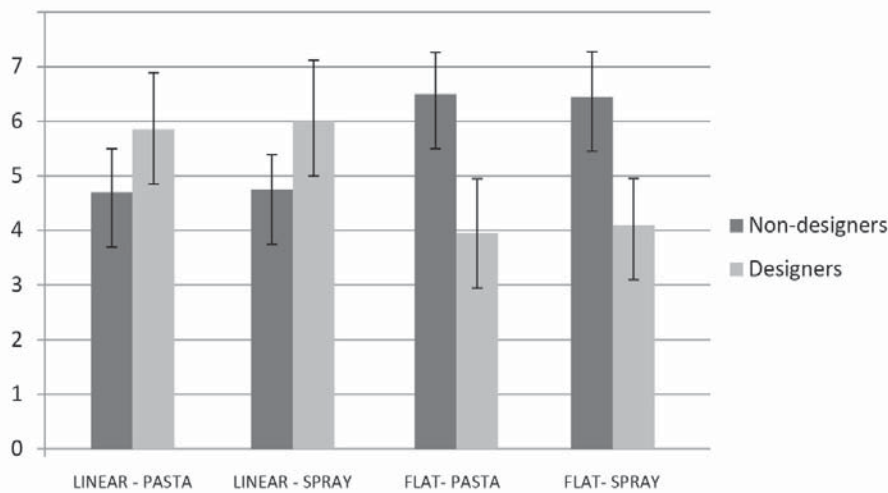

Figure 2. Mean rates for the instructions design across the participant groups.

Table 1. The most common design features mentioned by the participants while describing each of the instructions designs.

Instructions design	Non-designers		Designers	
	Attractive features	Unattractive features	Attractive features	Unattractive features
Linear - pasta	simple	outdated	clean simplified appealing	
Linear - spray	light	indistinct plain	clean elegant	unnoticeable
Flat - pasta	attractive modern stylish		uniformed cohesive	cluttered
Flat - spray	modern eye-catching colourful			dark cluttered

4 DISCUSSION

The results showed that the product type did not affect the attractiveness evaluation. Participants' responses were not influenced by graphical elements also. More interesting finding is that there was a significant difference in the attractiveness perception between designers and non-designers. First of all, designers were more severe than users while evaluating the samples, and this was not surprising. While designers preferred linear and simple instructions design, laypeople were attracted by the colourful designs made of planes. As noted by Tractinsky and Meyer (1999), people prefer simple graphical presentations that facilitate efficient information processing. Generally, well-trained designers rely on this concept in their work, so this probably guided their evaluation in our study. On the other side, laypeople show a preference for visual embellishments which are not essential to understanding the information (Bateman 2010), and this might resulted with their higher scores for colourful instructions.

The results of the evaluations were in line with the verbal explanations of participants. Most of the designers mentioned "clean" and simplified form as characteristics of attractive visualizations, while laypeople appreciated the power of colour and the modern look of more complex designs.

Our finding about the gap between designers and users is in line with other studies that showed differences between this two groups of participants. Quispel (2014) investigated how people differ in their evaluation of data visualizations, and the results showed that designers rated the attractiveness of samples differently than laypeople. This is in accordance with the study focused on product design, conducted by Hsu et al (2000). They also reported about different preferences across the participants while evaluating telephone design.

5 CONCLUSIONS

Overall, our results suggest that designers prefer simple and sophisticated designs, while laypeople like embellished colourful visualizations. The study demonstrated notable mismatch between these two groups of respondents. In the light of our findings, we suggest that every graphical presentation of instructions for product use should be tested on the group of end-users. Testing prototypes is common practice in design projects, so it should not be the exception in instructions design.

Our study have limitations. We measured only the attractiveness of instructions design, without evaluating their understandability. Future studies should investigate both measures in order to get more data about functional and aesthetic aspects of instructions design. Furthermore, line and plane are not the only graphical elements commonly used for instructions design, so other elements (such as dot) should be manipulated as independent variable in future research.

6 REFERENCES

- Agrawala, M., Phan, D., Heiser, J., Haymaker, J., Klingner, J., Hanrahan, P., Tversky, B. 2003. "Designing Effective Step-by-Step Assembly Instructions" ACM Transactions on Graphics (TOG) 22 (3): 828-837
- Barlow, T., and Wogalter, M.S., 1991. "Increasing the Surface Area on Small Product Containers to Facilitate Communication of Label Information and Warnings." Proceedings of Interface 91(7): 88-93
- Bateman, S., Mandryk, R. L., Carl Gutwin, C., Genest, A., McDine, D., and Brooks, C. 2010. "Useful junk?: The effects of visual embellishment on comprehension and memorability of charts" Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, 2573-2582. ACM
- Bonnardel, N., Piolat, A., and Le Bigot, L. 2011. "The impact of colour on Website appeal and users' cognitive processes." Displays 32(2): 69-80
- Hsu, S.H., Chuang, M. C., and Chang, C. C. 2000. "A Semantic Differential Study of Designers' and Users' Product Form Perception" International Journal of Industrial Ergonomics 25(4): 375-391
- Magnier, L., Schoormans, J., and Mugge, R. 2016. "Judging a Product by Its Cover: Packaging Sustainability and Perceptions of Quality in Food Products." Food Quality and Preference 53: 132-142
- Monk, A. and Lelos, K., 2007. "Changing Only the Aesthetic Features of a Product Can Affect Its Apparent Usability." In Home Informatics and Telematics: ICT for The Next Billion, edited by Alladi Venkatesh, Timothy Gonsalves, Andrew Monk and Kathy Buckner, 221-233. Boston: Springer
- Quispel, A. and Maes, A. 2014. "Would You Prefer Pie or Cupcakes? Preferences for Data Visualization Designs of Professionals and Laypeople in Graphic Design." Journal of Visual Languages & Computing 25(2): 107-116
- Tractinsky, N. and Meyer J. 1999. "Chartjunk or Goldgraph? Effects of Presentation Objectives and Content Desirability on Information Presentation." MIS Quarterly 23(3): 397-420

- Vogt, S. and Magnussen, S. 2007. "Follow results: "Expertise in Pictorial Perception: Eye-Movement Patterns and Visual Memory in Artists and Laymen" Perception 36(1): 91-100
- Wang, E. S. T. 2013. "The Influence of Visual Packaging Design on Perceived Food Product Quality, Value, and Brand Preference." International Journal of Retail & Distribution Management 41(10): 805-816

Corresponding author:
Dorotea KOVAČEVIĆ
University of Zagreb, Faculty of Graphic Arts, Department of Graphic Design and Imaging
Getaldićeva 2, 10000 Zagreb, Croatia
phone: +385 1 237 10 80/226, fax: +385 1 237 10 77, e-mail: dorotea.kovacevic@grf.hr

Co-author(s):
Maja BROZOVIĆ
University of Zagreb, Faculty of Graphic Arts, Department of Graphic Design and Imaging
Getaldićeva 2, 10000 Zagreb, Croatia
phone: +385 1 237 10 80/213 • fax: +385 1 237 10 77 • e-mail: maja.brozovic@grf.hr