
User Experience: A Multiple Sorting Method based on Personal Construct Theory

Ali al-Azzawi
Digital World Research Centre
& Department of Psychology
University of Surrey
Guildford
Surrey, GU2 7XH, UK
a.al-azzawi@surrey.ac.uk

David Frohlich
Digital World Research Centre
University of Surrey
Guildford
Surrey, GU2 7XH, UK
d.frohlich@surrey.ac.uk

Margaret Wilson
Department of Psychology
University of Surrey
Guildford
Surrey, GU2 7XH, UK
m.wilson@surrey.ac.uk

Copyright is held by the author/owner(s).

CHI 2008, April 5 – April 10, 2008, Florence, Italy

ACM 1-xxxxxx

Abstract

A multiple card-sorting task is described for the purpose of exploring and understanding the *User Experience*. This method is part of a Personal Construct Theory approach, and is validated with experimental data that show insight into how users conceptualise their experience with MP3 players, as represented by photographs. This approach allows access to users' constructs and categories, which enables access to their subjective meanings and experience.

Keywords

Use Experience, Personal Construct Theory, Multiple Sorting Procedure

ACM Classification Keywords

H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous

Introduction

People's experiences with technology have many aspects that may be instrumental or non-instrumental [10]. For example, instrumental aspects are related to the technology's functionality and its ability to deliver towards achieving a goal. A non-instrumental aspect would be more related to aesthetic and hedonic values. These aspects have been explored in various studies

[11. 14. 6. 13. 8], and are central to how a user experiences technology.

People's conceptualising and understanding of their world, and therefore their knowledge, is based on categorisation [7]. Such understandings are essentially the building blocks of the meanings that a user will give to a particular experience or perception. Traditional experimental psychology studies have employed the 'semantic differential' approach to ask participants to rate their perceptions along a linear scale [15]. This has been seen as rudimentary, but effective method for accessing 'meaning' and how people make sense of the world. However, a major development in psychological theory was that proposed by Kelly [12], who introduced the idea that a person is constantly updating their understanding by reconstruing their world. Kelly's theory is called the Personal Construct Theory (PCT).

Kelly's interest in the application of these ideas in a clinical setting led him to develop a technique for eliciting personal constructs in an interview context. This technique is known as the 'Repertory Grid Test' (RGT) and involves asking people to consider triads of items and say what is similar about two of them which makes them different from the third. This procedure results in a series of contrastive dimensions, on which the participants are then asked to rate the items. The resulting data can be analyzed statistically to generate a grid of constructs showing how participants interpret the items, and also qualitatively to understand the nature of the constructs used by different people on similar items. Although Kelly first used this technique to understand personality differences in the construction of social perceptions, it has been applied in a wide variety of settings, including market research

and product design. In the context of user experience, the RGT method has been successfully used to explore users' constructs of web sites [9] and other user experience questions [5. 4].

Both of the above methods (semantic differential and RGT) techniques make the assumption that user constructs are polar (e.g. usable vs. awkward), and therefore asks participants to make polar judgements regarding categorisation. However, people's categorisations do not necessarily fall along one dimension. The tedious nature of the RGT method and length of time it takes to administer (and analyse) the RGT method can also have adverse effects on the quality of the data. Another common problem for the repertory grid is that of verbalisation. Participants cannot always say what they mean.

The Method applied to MP3 players

The above critiques of the repertory grid test have led to new variations, and one such critique is made by Canter, Brown and Groat [2. 3]. They point out that the original RGT was designed at a time when the available statistical tests for analyzing it were limited and that the technique assumed linear dimensionality which is not necessarily applicable to all concepts. They recommend a more open ended sorting of multiple items with no restrictions on the type of constructs generated or the distribution of the category assignments. Their own technique is a multiple sorting procedure designed as the focus of a broader interview about personal interpretations of items. It involves presenting people with a large set of items which can be grouped into as many different piles as they like, as many times as they can. After each sort, participants are interviewed about the reasons for their

classifications and the way in which groups are similar or different from each other. Multidimensional Scalogram Analysis (MSA) is then performed on the resulting sort data, to yield spatial maps of constructs for interpretation alongside interview discussions.

The MSP been applied to many disciplines, including environmental psychology, forensics, and team organisation. Applying this method to the problem of user experience seemed to be a worthwhile exercise. We have applied this method in a study that was designed to explore people's conceptualisation of MP3 players [1]. Life-size photographs of 35 different MP3 players were shown on cards to 30 student volunteers. Participants were asked to sort all cards into any number of piles, and they were allowed to have any number of cards in each pile. A sorting criteria is equivalent to a construct, and the label for each pile is equivalent to a category. A construct could be for example "usability", whereas a category would be "awkward" or "easy to use".

The aggregates of the constructs from that study are shown in Table 1. The figure listed in the "References" column shows the number of times (among all the participants) that a particular construct was referenced. Also, the data were reduced in order to keep it to a manageable group. For example, "screen size" and "screen shape" were pooled into "screen".

Figure 1 shows the 2D representation of the data. The closeness of items to each other means that they had similar profiles and therefore were located in similar piles in the sorting tasks. This way of representing such complex data makes it considerably easier to analyse, compared with complex RGT representations.

No.	Construct	References
1	Screen	44
2	Size	29
3	Controls	26
4	Shape	25
5	Colour	24
6	Aesthetics	22
7	Brand	18
8	Design	17
9	Functions	17
10	Usability	17
11	Convenience	14
12	Buy	11
13	Price	11
14	Watch	8
15	Headphones	8

Table 1. Some of the constructs used in all the free-sorts by all the participants [1].

This approach allows product designers access to how users conceptualise specific products, thereby giving the designers the opportunity to "see" what the users "see" and what they pay attention to, explicitly or otherwise, across similar products. The method also involves talking to participants about the reasons for their sorts, giving further insight into their subjective construction of similarity and difference between the items. Therefore, employing such an approach will enhance the designers' ability to tailor their designs to the users' lifeworld.

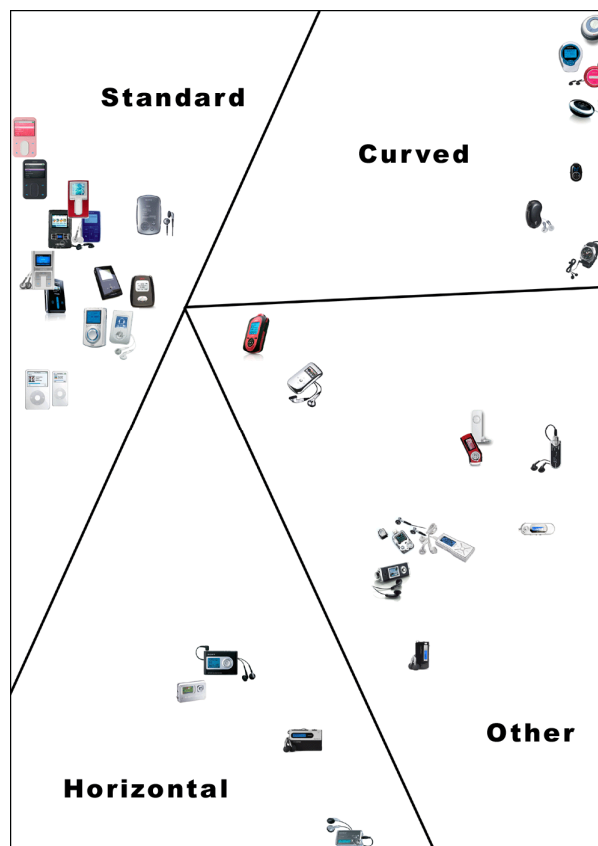


Figure 1. MSA of first sort for all participants [1].

Personal constructs exist in any realm where a user understands something, or makes sense of it. This means that the approach can be applied to objects, pictures of objects, screenshots of web pages, abstract ideas and even experiences themselves. Essentially, if a user can sort the entity into piles, that means they are

organising these entities into categories of a particular construct.

Conclusion

In the workshop, we will illustrate this approach to construct elicitation and argue for its value in user experience research.

Acknowledgements

This work is supported by Openia (www.openia.com).

Reference

- [1] Al-Azzawi, A., Frohlich, D., and Wilson, M. Beauty constructs for MP3 players. *Affective Communication in Design - Challenges for Researchers. CoDesign - International Journal of CoCreation in Design and the Arts* 3(S1), 59-74. 2007. London, Taylor & Francis.
- [2] Canter, D. Doing psychology that counts: George Kelly's influence. *Personal Construct Theory & Practice* 4, 27-38. 2006.
- [3] Canter, D., Brown, J., and Groat, L. A Multiple Sorting Procedure. Brenner, M., Brown, Jennifer, and Canter, David. *The Research Interview: Uses and Approaches*. 1985. London, Academic Press.
- [4] Fallman, D. Integrating User Experience into the Design Process with the Repertory Grid Technique. *WP9 Workshop on Innovative Approaches for Evaluating Affective Systems*. 2006. Stockholm, Sweden.
- [5] Fallman, D. and Waterworth, J. Dealing with User Experience and Affective Evaluation in HCI Design: A Repertory Grid Approach. *CHI 2005*. 2005.

- [6] Forlizzi, J. and Batterbee, K. Understanding experience. DIS 2004. Proceedings of DIS 2004 , 261-268. 2004. New York, ACM Press.
- [7] Goldstone, R. L. and Kersten, A. Concepts and Categorization. Healy, A. F. and Proctor, R. W. Comprehensive handbook of psychology, Volume 4: Experimental psychology. (22), 599-621. 2003. New Jersey, Wiley.
- [8] Hassenzahl, M. The Interplay of Beauty, Goodness, and Usability in Interactive Products. Human-Computer Interactions 19, 319-349. 2004.
- [9] Hassenzahl, M., Beu, A., and Burmester, M. Engineering Joy. IEEE Software 18(1), 70-76. 2001.
- [10] Hassenzahl, M. and Tractinsky, N. User Experience - A research agenda. Behaviour & Information Technology 25(2), 91-97. 2006.
- [11] Jordan, P. W. Designing pleasurable products: An introduction to the new human factors. 1999. London, Taylor & Francis.
- [12] Kelly, G. A. The Psychology of Personal Constructs, Volume One: Theory and Personality. (1). 1955. New York, Norton.
- [13] McCarthy, J. and Wright, P. C. Technology as Experience. 2004. Cambridge, MA, USA, MIT Press.
- [14] Norman, D. A. Emotional design: Why we love (or hate) everyday things. 2003. New York, Basic Books.
- [15] Osgood, C. E., Suci, G. J., and Tannenbaum, P. H. The measurement of meaning. 1957. Urbana, IL, Illinois University Press.