# A Study of Different Consumer Groups' Preferences of Time Display on Watches

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**Abstract.** Nowadays, through creative time displays, designers increase the value and novelty of watches for consumers in order to increase their purchase intention. Moreover, the diversity of consumer demands to watches has created many niche markets. This study raises the questions of whether designers' different time display techniques for specific consumer groups be identified by the target groups, and what are the differences between the different groups' preferences for time displays on watches. A questionnaire survey was conducted. The findings are: a. Different groups of consumers have different preferences of time displays on watches. b. There is high correlation between consumers' preference and purchase intention regarding time displays on watches. c. There is significant correlation between cognition of time display attributes (readability, playfulness, and innovation) and preference. Among the three attributes, readability influences preference the most. Thus, regarding time displays on watches for different consumer groups, there should be different designs.

**Keywords:** Watch time display, Consumers preference, Consumer group.

## 1    Introduction

Nowadays, the demand for watches is highly prevalent; however, with the convenience and advancements of technology, the simple time functions of watches are replaced by various kinds of technological products, thus, changing the use of watches from the single function of precision time to symbolic implication. Watches now represent their owner's identity and personal style (Coat, 2003). Current watch markets can be divided into 2 categories, luxury watch designs made from expensive metals and worn as jewelry, and low-price watches that are easily changed with fashion trends (Tseng and Tseng, 1996). In intensely competitive low-price markets, the functions and materials of watches are restricted by sale prices and production costs, thus, the appearance of watches becomes the key to the design of the products on the market. In recent years, design techniques and surface materials are diverse. The time display of watches is one of the important techniques for designers to convey their design language. Through creative time displays, designers increase the value and

novelty of products for consumers in order to increase their purchase intention. More-over, the diversity of consumer demands has created many niche markets. New brands and sales channels continue to expand, and enterprises tend to divide consum-ers into different consumer groups, according to market segmentation, and establish marketing and design strategies according to consumer groups' characteristics in or-der to satisfy consumers' needs more precisely and win the market shares (McCarthy, 1981; Kotler, 1994). This study raises the questions of whether designers' different time display techniques for specific consumer groups be identified by the target groups, and what are the differences between the different groups' preferences for time displays on watches. These issues are worthy of further study. Differences of gender and age can be the criteria for watch designers. In addition, regarding the differences of consumers for design and non-design backgrounds, designers should not focus on their own preferences when designing time displays on watches, while neglecting the consumers' preferences.

## 2     Research Method

This study included three stages. First, the researcher collected, classified, and record-ed images of watch samples available on the market; in the second stage, a consumer questionnaire was designed; and in the third stage, a questionnaire survey was con-ducted in order to identify different groups' preferences for time displays of watches.

### 2.1     Questionnaire Sample Selection and Image Production

The functions of watches on the market are varied. In addition to time displays, there are time zone displays, dates, and time counters. In order to balance the directions of research, according to time display of watches currently on the market, this study divided them according to indicator hands, numbers, electronics, and various combi-nations. This study limited the samples to watches with indicator hands that are cur-rently available on the market. Time display has the basic functions of hours and minutes; however, the types of movements and displays are unlimited. First, through catalogues, magazines, and the internet, the researcher collected pictures of watches available on the market, and selected pictures of front angles, with 86 samples col-lected. By the focus group research method, samples were selected. The focus group of this study was the graduate students of the Department of Industrial and Commer-cial Design, National Taiwan University of Science and Technology, including 2 males and 4 females. By group discussion, the samples were clustered according to similarity of pictures into 12 clusters. In each cluster, the researcher selected one rep-resentative as the sample. In order to avoid subjects' confusion with the appearance and modeling of products and errors in research findings, the researcher eliminated the factors of appearance and modeling, including color, materials, quality, brand names, etc. Thus, the subjects judged preference according to the time display of the

watches. However, for some specific samples, since the appearance was significantly associated with time design techniques, the appearance factor was retained. Processing of samples is as shown in Figure 1.
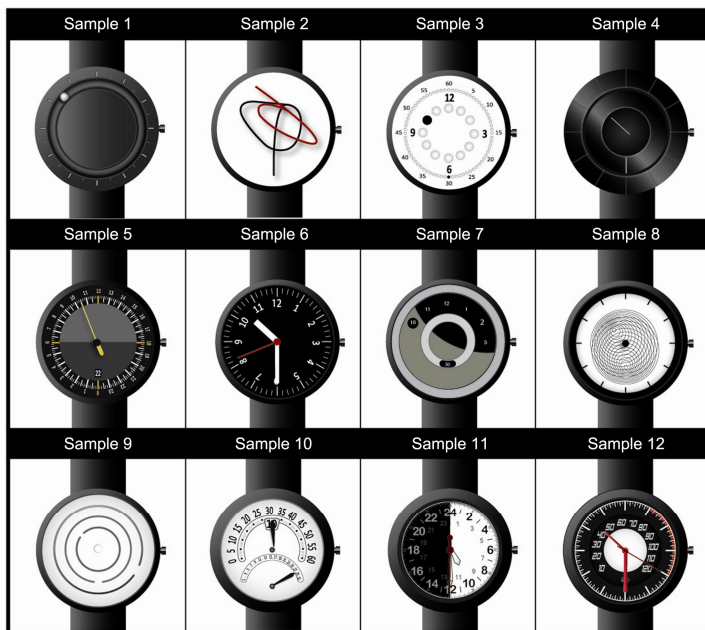


**Fig. 1.** Final Samples for the questionnaire

## 2.2     Questionnaire Design

In order to obtain the latest market situation, this study did not set exclusion criteria. Investigation data included only basic information, such as gender, age, and design background. In addition to consumers' preference and purchase intentions, the questionnaire included the attributes of time display of watches, "readability", "playfulness", and "innovation". Scoring was based on a Likert 7 point scale, ranging from 1 (strongly disagree) to 7 (strongly agree). The subjects completed the questionnaire according to subjective feelings regarding the time display of watches.

## 2.3     Questionnaire Survey

The questionnaires were distributed by the internet and convenience sampling areas located on roadsides. There were totally 298 subjects, with 295 valid questionnaires. Descriptive statistics was conducted by SPSS. Frequency distribution is as shown in Table 1.

**Table 1.** Frequency distribution of subjects

| Variables | Levels | Numbers | % |
|---|---|---|---|
| age | below 20 years old | 60 | 20.3 |
| | aged 21-40 | 190 | 64.4 |
| | above 41 years old | 45 | 15.3 |
| gender | Male | 191 | 64.7 |
| | Female | 104 | 35.3 |
| Design background | Yes | 20 | 6.7 |
| | No | 275 | 93.3 |

## 3    Results and Analysis

The results regarding the subjects' views of time display attributes, namely, readability, playfulness, innovation, preference, and purchase intention are organized in Table 2.

**Table 2.** The result of five dimensions measurement

| | Readability | Playfulness | Innovation | Preference | Purchase intention |
|---|---|---|---|---|---|
| Sample1 | 3.08 | 4.53 | 4.65 | 3.18 | 2.87 |
| Sample 2 | 2.44 | 4.29 | 4.72 | 2.85 | 2.52 |
| Sample 3 | 4.22 | 4.37 | 4.22 | 3.81 | 3.35 |
| Sample 4 | 4.55 | 4.22 | 4.07 | 4.03 | 3.75 |
| Sample 5 | 3.64 | 3.78 | 3.89 | 3.38 | 3.03 |
| Sample 6 | 5.93 | 3.54 | 3.12 | 4.81 | 4.49 |
| Sample 7 | 4.86 | 5.32 | 5.35 | 4.71 | 4.31 |
| Sample 8 | 2.32 | 3.97 | 4.59 | 2.67 | 2.52 |
| Sample 9 | 2.49 | 4.07 | 4.57 | 2.73 | 2.47 |
| Sample 10 | 4.57 | 4.52 | 4.59 | 3.82 | 3.52 |
| Sample 11 | 4.23 | 4.28 | 4.34 | 3.82 | 3.51 |
| Sample 12 | 4.77 | 4.01 | 3.85 | 3.84 | 3.53 |

### 3.1    Analysis on Preference of Consumers of Different Genders for Time Displays on Watches

Consumers' preferences for time displays on watches, in terms of gender, were analyzed by the t test of mean difference. The results are shown in Table 3. As seen, male and female consumers' preferences for Sample 1, 5, and 10 are significantly different.

**Table 3.** Analysis on preference of consumers of different genders

| Sample | Male | | Female | | t | P-Value |
|---|---|---|---|---|---|---|
| | **Mean** | **SD** | **Mean** | **SD** | | |
| Sample 1 | 3.32 | 1.55 | 2.90 | 1.39 | 2.306 | **0.022*** |
| Sample 2 | 2.83 | 1.60 | 2.90 | 1.57 | -0.396 | 0.693 |
| Sample 3 | 3.80 | 1.47 | 3.84 | 1.42 | -0.230 | 0.818 |
| Sample 4 | 4.14 | 1.37 | 3.84 | 1.39 | 1.814 | 0.071 |
| Sample 5 | 3.51 | 1.58 | 3.14 | 1.38 | 1.972 | **0.050*** |
| Sample 6 | 4.77 | 1.33 | 4.88 | 1.34 | -0.708 | 0.480 |
| Sample 7 | 4.80 | 1.55 | 4.56 | 1.69 | 1.221 | 0.223 |
| Sample 8 | 2.72 | 1.56 | 2.60 | 1.52 | 0.643 | 0.521 |
| Sample 9 | 2.82 | 1.48 | 2.58 | 1.51 | 1.319 | 0.188 |
| Sample 10 | 3.96 | 1.34 | 3.57 | 1.48 | 2.268 | **0.024*** |
| Sample 11 | 3.94 | 1.44 | 3.60 | 1.56 | 1.884 | 0.061 |
| Sample 12 | 3.92 | 1.38 | 3.70 | 1.47 | 1.277 | 0.203 |

"*" Represents reaching significance level of 0.05.

Regarding time display attributes of readability, playfulness, and innovation, male consumers suggested that the time display of Sample 1 is simple, unique, and creative; whereas, the time display of Sample 1 appeared dull to female consumers, and the time is not easily identified. Male consumers suggested that the time display of Sample 5 is industrial, clear, and simple. However, for female consumers, the number fonts are too small, and the time is not easily identified. Thus, their preferences are different. Male consumers' cognition of readability, playfulness, and innovation of Sample 10 is higher than those of female consumers, indicating positive preferences. This study found that male consumers prefer simple designs of hour and minute hands; whereas, female consumers prefer more clear and specific time information.

## 3.2    Analysis on Preference of Consumers of Different Ages for Time Displays on Watches

Regarding the preferences of consumers of different ages for time displays on watches, One-way ANOVA, was conducted, and the results are shown in Table 4. As seen, consumers of different ages have significantly different cognitive outcomes regarding Sample 1, Sample 2, Sample 6, Sample 7, and Sample 12.

**Table 4.** One-way ANOVA of ages difference

| Sample | Group 1 below 20 years old | Group 2 aged 21-40 | Group 3 above 41 years old | F | P-Value | Scheffe |
|---|---|---|---|---|---|---|
| Sample 1 | 3.65 | 2.99 | 3.31 | 4.627 | **0.011*** | G1> G2, G1≒ G3, G2≒G3 |
| Sample 2 | 3.38 | 2.72 | 2.73 | 4.280 | **0.015*** | G1>G2, G1>G3, G2≒ G3 |
| Sample 3 | 4.07 | 3.72 | 3.84 | 1.310 | 0.271 | -- |
| Sample 4 | 4.05 | 4.11 | 3.69 | 1.700 | 0.184 | -- |
| Sample 5 | 3.72 | 3.32 | 3.20 | 1.969 | 0.141 | -- |
| Sample 6 | 4.37 | 4.82 | 5.36 | 7.418 | **0.001*** | G3>G1, G2≒ G1, G2≒G3 |
| Sample 7 | 4.98 | 4.79 | 4.00 | 5.738 | **0.004*** | G1>G3, G2>G3, G1≒ G2 |
| Sample 8 | 2.82 | 2.69 | 2.40 | 0.982 | 0.376 | -- |
| Sample 9 | 3.05 | 2.68 | 2.51 | 1.962 | 0.142 | -- |
| Sample 10 | 3.80 | 3.86 | 3.71 | 0.209 | 0.812 | -- |
| Sample 11 | 3.88 | 3.82 | 3.73 | 0.129 | 0.879 | -- |
| Sample 12 | 3.75 | 3.73 | 4.44 | 4.927 | **0.008*** | G3>G2, G3>G1, G1≒ G2 |

"*" Represents reaching significance level of 0.05.    In Scheffe test, "--" represents no significant difference.

Scheffe test found that consumers below 20 years old have higher evaluations for the time display of Sample 1, in comparison to consumer groups aged 21-40. According to the investigation results of time display attributes of readability, playfulness, and innovation, consumers below 20 years old suggest that the time display of Sample 1 is simple and has high quality. For consumer groups aged 21-40, the time display of Sample 1 is dull, and thus, their preference is low. Regarding the preference for Sample 2, in comparison to the other two groups, consumers below 20 years old have a higher preference. For consumers below 20 years old, the time display of Sample 2 is unique, simple, and interesting. For the other two groups of above 21 years old, Sample 2 is disordered, and thus, their evaluation is low. Regarding the preference for Sample 6, groups above 41 years old are different from those below 20 years old. Groups above 41 years old find it is easy to read the time display of Sample 6, which matches their personal needs. For consumers below 20 years old, Sample 6 is similar to traditional watches and the appearance is not unique, thus, preference is low. Regarding the preference for Sample 7, the groups' cognitive results are significantly different. Groups above 41 years old have less preference for Sample 7, in comparison to the other groups, as they feel that Sample 7 is not easily read, and regard it an

inconvenient utility. For the other two groups, the time display of Sample 7 is simple, easy to read, and unique, thus, the groups are different. Regarding the preference for Sample 12, consumers above 41 years old like it the most, as the movements of the hour and minute hands are the same as traditional watches and easy to read. Thus, in comparison to the other two groups, they prefer Sample 12. For groups below 21 years old and aged 21-40, the preference for the time display of Sample 12 is similar to traditional watches. They do not understand the numbers on surface of the watch, which influences their reading, thus, their preference is low. Generally speaking, the group below 20 years old prefers new and interesting designs, and their preference is higher than the other two groups. Groups aged 21-40 and above 41 years old value the convenience of easily reading the time on a watch. However, according to the preference results of the two groups, those aged 21-40 prefer innovative designs, in comparison to consumers above 41 years old.

## 3.3     Analysis on Preference of Designers and Consumers for Time Displays on Watches

Regarding the preference results of designers and consumers for time displays on watches, t test of mean difference was conducted, and the results are shown in Table 5. As seen, designers' and consumers' preferences for Sample 1, Sample 2, and Sample 11 are significantly different.

**Table 5.** Analysis on preference of designers and consumers

| Sample | Designers | | Consumers | | t value | P-value |
| --- | --- | --- | --- | --- | --- | --- |
| | Mean | SD | Mean | SD | | |
| Sample 1 | 4.6 | 0.99 | 3.36 | 1.01 | 3.596 | **0.001*** |
| Sample 2 | 3.75 | 1.01 | 2.9 | 1.56 | 2.145 | **0.037*** |
| Sample 3 | 4.0 | 1.21 | 4.2 | 1.37 | -0.528 | 0.6 |
| Sample 4 | 4.2 | 1.71 | 4.06 | 1.17 | 0.328 | 0.744 |
| Sample 5 | 3.05 | 1.63 | 3.53 | 1.47 | -1.084 | 0.284 |
| Sample 6 | 4.7 | 1.45 | 5.03 | 1.24 | -0.867 | 0.39 |
| Sample 7 | 4.7 | 1.80 | 4.6 | 1.68 | 0.66 | 0.947 |
| Sample 8 | 2.9 | 1.97 | 2.43 | 1.31 | 1.009 | 0.318 |
| Sample 9 | 3.0 | 1.91 | 2.6 | 4.56 | 0.887 | 0.380 |
| Sample 10 | 3.1 | 1.33 | 3.6 | 1.56 | -1.171 | 0.247 |
| Sample 11 | 2.55 | 1.27 | 3.53 | 1.01 | -3.036 | **0.004*** |
| Sample 12 | 3.85 | 1.59 | 4.0 | 1.51 | -0.336 | 0.738 |

"*" Represents reaching significance level of 0.05.

According to the investigation results of time display attributes, readability, playfulness, and innovation, designers suggest that the time display of Sample 1 is simple, easy to read, and the appearance is fashionable. For consumers, it is not easy to read Sample 1 and the style is too simple, thus, preference is low. Regarding the cognitive results of preference for Sample 2, designers and consumers are significantly different. Designers suggest that the time display is the same as traditional displays; however, the design of the hour and minute hands are creative, thus, the evaluation is high. Regarding preference for Sample 11, consumers highly prefer Sample 11, suggest it is creative to divide night and day as black and white, and it is easier to read the time. Designer evaluation of Sample 11 is lower, they suggest the time display is not creative, and the numbers on the watch surface are too numerous and disordered. Generally speaking designers highly prefer creative time displays, whereas consumers prefer designs with easy reading of time.

### 3.4 Correlation Analysis between Preference and Purchase Intentions

Regression analysis is conducted by means of preference and purchase intentions of time displays on watches. According to analytical results regarding cognition of preference for time displays on watches, the F value of variance significance test is 1073.42 and the P value of significance testing is 0.000, which is below the significance level 0.05. Thus, the overall explained variance of the regression model of preferences and purchase intentions is significant. There is significant correlation between preference and purchase intention. It can explain 99.1%of the variance and the correlation coefficient is 0.995. Thus, preference and purchase intentions are highly related. Results of regression analysis are as shown in Table 6.

**Table 6.** Results of regression analysisof purchase intentions

| Predicting Variables | B | S.E. | Beta($\beta$) | T |
|---|---|---|---|---|
| Intercept | 0.158 | 0.108 | -- | 1.464 |
| Purchase intention | 1.047 | 0.032 | 0.995 | 32.763*** |

$R^2$=0.991,Adjusted $R^2$=0.990,    F=1073.42***

"***" Represents reaching significance level of 0.001.

### 3.5 Correlation Analysis Between Readability, Playfulness, Innovation, and Preference

Regression analysis is conducted by means of investigation of preference, readability, playfulness, and innovation of time displays on watches. According to analytical results, the F value of variance significance testing is 62.542, and the P value of significance testing is 0.000, which is below the significance level of 0.05. Therefore, the overall explained variance of the regression model regarding readability, playfulness, innovation, and preference is significant. The regression coefficient of readability is 0.624, playfulness is 0.166, and innovation is 0.122, which explains95.9%of the

variance. Thus, there is a significant correlation between cognition of time display attributes and preference. Among the three attributes, readability influences preference the most. Regression analysis results of time display attributes and preferences are organized, as shown in Table 7.

**Table 7.** Results of regression analysis of purchase intentions

| Predicting Variables | B | S.E. | Beta($\beta$) | T |
|---|---|---|---|---|
| Intercept | -0.044 | 0.617 | -- | -0.072 |
| Readability | 0.624 | 0.121 | 1.006 | 5.138* |
| Playfulness | 0.166 | 0.501 | 0.106 | 0.332 |
| Innovation | 0.122 | 0.457 | 0.097 | 0.267 |

$R^2$=0.959, Adjusted $R^2$=0.944, F=62.542*

"*" Represents reaching significance level of 0.05.

## 4    Conclusions

Based on the above investigation results and analysis, the conclusions are shown, as follows.

1. Male and female consumers have different preferences for time displays on watches. Male consumers prefer simple hour and minute hands, creative time displays, and their purchase intentions are higher. Female consumers prefer samples with more clear time information. Time displays of unique design with difficult reading will negatively influence female consumers' purchase intentions.
2. Consumers with different ages have different preferences for time displays on watches. Groups below 20 years old prefer new and interesting designs, and their preferences and purchase intentions are higher than the other two groups. Groups aged 21-40 and above 41 years old pay attention to the convenience of reading the time on watches. However, according to preference results of the two groups, groups aged 21-40 prefer creative designs, in comparison to consumer groups aged above 41.
3. Designers and consumers have different preferences regarding time displays of watches. Designers highly prefer creative time displays and have higher purchase intentions. Consumers prefer designs that are easily and clearly read.
4. There is high correlation between consumers' "preference" and "purchase intention" regarding time displays on watches.
5. There is significant correlation between cognition of time display attributes and preference. Among the three attributes, readability influences preference the most.

Based on the above, different groups of consumers have different preferences of time displays on watches. Thus, regarding time displays on watches for different consumer groups, there should be different designs. The research findings of the preferences for different consumer groups can serve as references for designs of time displays on watches in order to satisfy different consumers' needs.

# References

1. Tseng, S.H., Tseng, C.H.: Project Study on Watches. IEK System Energy Department of Industrial Technology Research Institute of Taiwan, R.O.C (1996)
2. Coates, D.: Watches Tell More than Time. McGraw-Hill, New York (2003)
3. Kotler, P.: Marketing Management: Analysis, Planning, Implementation, and Control. Prentice Hall, New Jersey (1994)
4. McCarthy, J.E.: Basic Marketing: A managerial Approach. Homewood, Richard D. Irwin Inc., Illinois (1981)