Green Retailing: The Influence of Clothing Display Props on Consumer Behavior

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Abstract. The operation of small and medium-sized clothing stores (SMCS) alleviates the excessive consumption of resources caused by e-commerce logistics. The display props that enhance the image of stores are important for SMCS. In this work, we use survey questionnaire, field experiment and statistical analysis of SPSS including Chi-square goodness-of-fit test, Chi-square test, Multiple Response and Contingency Table to analyze the use of display props in SMCS. Results are as follows: first, props in clothing stores will affect the consumers’ purchase decision, and the coordination of props can improve the sales of stores. Second, the store should pay attention to the aesthetics, interest and functionality of the display props. Third, the general methods of using props to promote SMCS’ sales include creating the display atmosphere, optimizing the space layout, strengthening the window image and enhancing the fitting experience.

1. Introduction of Display Props

Nowadays, the problem of resource consumption caused by e-commerce logistics is becoming increasingly prominent. In order to promote the coordinated development of economy and ecology, an operation model combining community-based physical retail and e-commerce has been steadily used. These small and medium-sized clothing stores (SMCS) try to avoid excessive consumption of resources caused by logistics transportation. The use of display props plays a vital role in SMCS. Display props are used to create brand image, set off environment atmosphere and display products. In this work, we classify props into basic props, decorative props and experiential props by investigating the characteristics of props used in clothing stores of Shenzhen and Zhengzhou, the People’s Republic of China (P.R.C.). Basic props include shelves, hangers, fitting mirrors, lamps, manikins and point of purchase advertising. Decorative props create the atmosphere, present the theme of stores and visualize the brand image. Natural scenery props (NSP), daily necessities props (DNP), festival celebration props (FCP) and abstract props (AP) are the types of decorative props. Experiential props that contain sofa seat props (SSP), play and viewing props (PVP), eating and drinking props (EDP) and interactive props (IP) enable consumers to generate direct behavioral activities. Even though the display props have aroused wide attention, how to use display props reasonably and effectively is still the key problem that stores face. In particular, we pose the research question: How display props can reasonably and effectively to promote sales?

In this work, firstly we propose research hypotheses. Then through conducting an online questionnaire survey and field experiments in SMCS, we validate the hypotheses, and summarize the
general methods of using props to promote SMCS’ sales. Finally, we discuss the potential study contributions and implications.

2. Research Hypotheses
In this work, hypotheses are divided into three categories based on population variables, visual marketing and act marketing (Table 1). Sales and brand awareness can be improved by the props [1]. Besides, the selection of different types of visual elements is based on the target customer group. While the retailers selling products to females are much concerning about the visual merchandising, it is vice versa for the retailers selling menswear [2]. Based on these literature, our first category hypotheses is proposed, H1: The use of display props has an effect on product sales and has a greater impact on women than men. Visual marketing creates an atmosphere and displays products sufficiently by organically combining layout, display and commodities. In fashion stores, an effective visual presentation could instill the image of brands and present the value of products [3]. Our second category hypotheses is, H2: Visual impact has an influence on product sales. Enhancing the consumer shopping experience through information exchange and interaction between stores and consumers could effectively maintain relationships and promote product sales [4]. The third category hypotheses is proposed, H3: Interactive experience has an impact on product sales. According to the literature in Table 1, we propose that, H21: Display atmosphere has an impact on product sales, H22: Space layout has an impact on product sales, H23: Window image has an impact on product sales, H24: Manikins have an impact on product sales, H31: Fitting experience has an impact on product sales.

Table 1. Hypotheses summaries of the impact of props on sales.

| Hypotheses classification | Literature source |
|---------------------------|-------------------|
| Based on population variables | H1: The use of display props has an effect on product sales and has a greater impact on women than men | (Kim et al, 2013) [1] |
|                           |                   | (Saricam et al, 2018) [2] |
| Based on visual marketing  | H2: Visual impact has an influence on product sales | (Ahn et al, 2016) [3] |
|                           | H21: Display atmosphere has an impact on product sales | (Francioni et al, 2018) [5] |
|                           | H22: Space layout has an impact on product sales | (Qu and Zhang, 2011) [6] |
|                           | H23: Window image has an impact on product sales | (Nobbs et al, 2015) [7] |
|                           |                   | (Seok et al, 2012) [8] |
|                           | H24: Manikins have an impact on product sales | (Gho et al, 2010) [9] |
|                           |                   | (Chatterjee et al, 2017) [10] |
| Based on act marketing    | H3: Interactive experience has an impact on product sales | (Chen and Ren, 2018) [4] |
|                           | H31: Fitting experience has an impact on product sales | (Jiang et al, 2009) [11] |

3. Consumer Survey

3.1. Design of the questionnaire
Two SMCS located in Zhengzhou, P.R.C. are selected as our research objects. Respondents are divided into three horizontal latitudes including gender, age and monthly clothing consumption. The survey is tested anonymously online and the investigation method is simple random sampling.

3.2. Discussion of the results
SPSS 20 is used for data analysis. Chi-square goodness-of-fit test, Chi-square test, Multiple Response and Contingency Table are used [12]. Chi-square goodness-of-fit test as shown in equation (1): \( k \) is the number of intervals, \( v \) is the degree of freedom, \( f_i \) is the observed frequency of \( x_1, x_2, \ldots x_n \) falling into \( i \) \((i=1,2,\ldots k)\), and \( np_i \) is the expected frequency. Constructing statistics \( \chi^2 \), through Chi-square quantile table, find the probability \( P \) as shown in equation (2)). \( P < 0.05 \), which indicates that it is statistically significant. Otherwise, it is not significant. The Chi-square test combined with Contingency Table (see Eq. (3)): A has \( k \) categories, B has \( r \) categories, and \( n \) individuals belong to both A\(_i\) category and B\(_j\) category. Constructing statistics \( \chi^2 \), \( P < 0.05 \) and it indicates that the correlation is significant.
\[ \chi^2 = \sum_{i=1}^{k} \frac{(f_i - np_i)^2}{np_i} \]  

(1)

\[ p(\chi^2(v) \leq \chi^2 (v)) = p \]  

(2)

\[ \chi^2 = \sum_{i=1}^{k} \sum_{j=1}^{n} \frac{(n_{ij} - \hat{n}_{n-i})}{n} \]  

(3)

3.2.1. Influence of display props on sales. A total of 402 individuals responded to the survey. We use Shapiro-Wilk to test the number of people with different consumption levels. \( P = 0.339 > 0.05 \), which indicates the data follows a normal distribution. \( P = 0.000 < 0.05 \), \( P = 0.001 < 0.05 \) (Table 2). It indicates most of consumers’ behavior are affected by props. \( P = 0.465 > 0.05 \) (Table 3). It indicates gender of consumers isn’t related to whether consumers are affected by props. Thus, H1 isn’t established. It can be concluded that display props have an impact on product sales, and have no gender differences.

### Table 2. Difference test of props’ influence.

| Items          | No. of people | Percent | Be affected     | Not be affected | \( \chi^2 \) | \( P \) |
|----------------|---------------|---------|-----------------|----------------|-------------|--------|
| Gender         |               |         |                 |                |             |        |
| Male           | 145           | 36.10%  | 107(73.80%)     | 38(26.20%)     | 32.834*     | 0.000  |
| Female         | 257           | 63.90%  | 198(77.00%)     | 59(23.00%)     | 75.179*     | 0.000  |
| Age (years)    |               |         |                 |                |             |        |
| 15-25          | 290           | 72.10%  | 231(79.70%)     | 59(20.30%)     | 75.179*     | 0.000  |
| 26-35          | 112           | 27.90%  | 74(66.10%)      | 38(33.90%)     | 11.571a     | 0.001  |
| Monthly clothing consumption (RMB) | | | | | | |
| 0-200          | 114           | 28.30%  | 80(70.20%)      | 34(29.80%)     | 18.561 a    | 0.000  |
| 200-500        | 192           | 47.80%  | 157(81.80%)     | 35(18.20%)     | 77.521a     | 0.000  |
| 500-1000       | 96            | 23.90%  | 68(70.80%)      | 28(29.20%)     | 16.667a     | 0.000  |

* 0 cells (0.0%) have an expected frequency of less than 5.

### Table 3. Correlation analysis of indexes of population variables and props’ influence.

| Chi-square test | Gender | Age | Consumption |
|-----------------|--------|-----|-------------|
| Pearson chi-square | 0.535* | 0.465 | 8.143* 3 0.004 | 7.001* 1 0.030 |
| Likelihood ratio | 0.531 1 0.466 | 7.793 1 0.005 | 7.086 2 0.029 |
| Linear by linear | 0.533 1 0.465 | 8.123 1 0.004 | 0.071 1 0.789 |
| No. of valid cases | 402 | | |

* 0 cells (0.0%) have an expected frequency of less than 5.

3.2.2. Consumer preference for display props. In Table 4, \( P = 0.000 < 0.05 \). There is a significant difference in the proportion of consumer preference for manikins. It is concluded that customers prefer beautiful and expressive manikins. This conclusion verifies that H2 (manikins have an impact on product sales) and H2 (visual impact has an influence on product sales) are valid.

### Table 4. Difference test of consumer preference for manikins.

| Items         | Plastic expressionless manikins | Plastic expressive manikins | Metal expressionless manikins | Cotton color expressionless manikins | \( \chi^2 \) | \( P \) |
|---------------|--------------------------------|-----------------------------|--------------------------------|-------------------------------------|-------------|--------|
| Gender        | Male 41(28.30%) | 41(28.30%) | 29(20.00%) | 34(23.40%) | 2.834* | 0.418  |
| Female        | 47(18.30%) | 66(25.70%) | 46(17.90%) | 98(38.10%) | 27.591* | 0.000  |
| Age (years)   | 58(20.00%) | 78(26.90%) | 55(19.00%) | 99(34.10%) | 17.228* | 0.001  |
| 26-35         | 30(26.80%) | 29(25.90%) | 20(17.90%) | 33(29.50%) | 3.357* | 0.340  |
| Monthly clothing consumption (RMB) | 26(22.80%) | 36(31.60%) | 17(14.90%) | 35(30.70%) | 8.316* | 0.040  |
| 200-500       | 41(21.40%) | 49(25.50%) | 42(21.90%) | 60(31.30%) | 4.792* | 0.188  |
| 500-1000      | 21(21.90%) | 22(22.90%) | 16(16.70%) | 37(38.50%) | 10.250* | 0.017  |
| Sample total  | 88(21.90%) | 107(26.60%) | 75(18.70%) | 132(32.80%) | 18.318* | 0.000  |

* 0 cells (0.0%) have an expected frequency of less than 5.
In addition, we analyze consumer preference for decorative props (natural scenery props, daily necessities props, festival celebration props and abstract props) and experiential props (sofa seat props, play and viewing props, eating and drinking props and interactive props). \( P=0.001<0.05 \) (Table 5), \( P=0.000<0.05 \) (Table 6). It is shown that the difference is significant. Among the decorative props, customers prefer natural scenery props and daily necessities props. Meanwhile, customers prefer sofa seat props and interactive props that are in the category of experiential props.

### Table 5. Preference for decorative props.

|     | N  | Percent | Percent of cases | \( \chi^2 \) | p   |
|-----|----|---------|------------------|--------------|-----|
| NSP | 246| 30.30%  | 61.20%           |              |     |
| DNP | 215| 26.40%  | 53.50%           |              |     |
| FCP | 175| 21.50%  | 43.50%           | 16.988a      | 0.001|
| AP  | 177| 21.80%  | 44.00%           |              |     |
| Total| 813| 100.00% | 202.20%          |              |     |

\( \text{a. 0 cells (0.0%) have an expected frequency of less than 5.} \)

### Table 6. Preference for experiential props.

|     | N  | Percent | Percent of cases | \( \chi^2 \) | p   |
|-----|----|---------|------------------|--------------|-----|
| SSP | 283| 33.10%  | 70.40%           |              |     |
| PVP | 205| 25.90%  | 51.00%           |              |     |
| IP  | 229| 26.80%  | 57.00%           | 49.963\(a\)  | 0.000|
| EDP | 139| 16.20%  | 34.60%           |              |     |
| Total| 856| 100.00% | 212.90%          |              |     |

\( \text{a. 0 cells (0.0%) have an expected frequency of less than 5.} \)

### 3.2.3. Consumer suggestions for using props. In Table 7, all suggestions are classified into three aspects: “aesthetics (40.30%)”, “interest (22.20%)” and “functionality (37.50%)”. \( P=0.221>0.05 \). It shows the difference isn’t significant. Combined with the above-mentioned that consumers prefer SSP and IP, it tests H21 (display atmosphere has an impact on product sales), H22 (space layout has an impact on product sales) and H3 (interactive experience has an impact on product sales) are correct.

### Table 7. Classification and analysis of consumer suggestions for reasonably using props.

|     | N  | Percent | Percent of cases | \( \chi^2 \) | p   |
|-----|----|---------|------------------|--------------|-----|
| Aesthetics | · Beauty | 36 | 25.00% | 40.90% |
|     | · Simplicity and art | 22 | 15.30% | 25.00% |
| Interest | · Originality and attraction | 32 | 22.20% | 36.40% |
| Functionality | · Reasonable layout | 22 | 15.30% | 25.00% |
|     | · Enhancing customer comfort | 32 | 22.20% | 36.40% |
| Total | 144 | 100.00% | 163.60% | 5.722\(a\) | 0.221|

\( \text{a. 0 cells (0.0%) have an expected frequency of less than 5.} \)

### 4. Field Experiment

#### 4.1. Design of field experiments

The concept model of field experiments is shown in Figure 1.
Field experiment is a method of exploring the causal relationship between independent and dependent variables in a real environment [13]. Independent variables are all kinds of stimuli that happened in a real scene. Dependent variables involve actual behavior. Field experiment has four features: realistic environment, the wide selection of subjects, the authenticity of the subjects’ behavior and the external validity of experimental results. Although the design of experiments is not tightly controlled, the external validity is high. In our work, we conduct field experiments in partners’ stores with H2, H21, H22, H23, H24, H3 and H31. Our field experiments last for 30 days. We manipulate the situational sensuality experience and incidental emotions through artificial environment situation factors. During the experiments, consumers are unaware that they are being tested. We use the comparison of effect and sales before and after the experiments to test our hypotheses. The implementation of field experiments that make the use of display props more reasonable is shown in Table 8.

Table 8. The implementation of field experiments that make the use of props more reasonable.

| Classification                      | No. 1 clothing store in shop (Zhengzhou) | No. 2 clothing store on street (Zhengzhou) |
|-------------------------------------|----------------------------------------|-----------------------------------------|
| Manipulate situational sensuality experience (enhancing visual impact) | - Add a square table in the center, a jewelry rack in the right space and a round table in the left space | - Clean environment  
  - Arrange the white rack  
  - Add a jewelry rack and plants |
| Create display atmosphere           | - Adjust left 3 right 3 of portal frame position to left 2 right 4 | - Adjust the sofa to the rear |
| Optimize space layout               | - Remove the portal frame that obscures the window  
  - Install the head on the model  
  - Replace the table with a jewelry rack | - There is no window in the store |
| Strengthen window image             | - Adjust the mirror to the position illuminated by three spotlights  
  - Adjust the items in front of the mirror and mirror’s tilt angle | - Change the position of the fitting mirror and portal frame and the position of shoe rack and shoe mirror  
  - Adjust the angle of the spotlights |
| Manipulate incidental emotions      | - | - |
| (enhancing interactive experience)  | - | - |
| Enhance fitting experience          | | |

4.2. Discussion of the results

Based on field experiments of display props optimization, monthly sales increased 14% at No. 1 store and 21% at No. 2 store. Besides, through an interview survey with our two partners, we get the following feedback: from the aspect of retail sales, field experiments that make the use of display props more reasonable have an obvious effect on turnover. In terms of stores’ image, partners’ stores are more simple and elegant than before. In terms of consumer behavior, during the sales process, the customers’ entry rate is increased and the time that customers stay in retail stores is longer than before. Although there are a few data, based on the external validity of the field experiment, the internal validity of the questionnaire and the interview survey with partners, our experimental results can verify that H21 (display atmosphere), H22 (space layout), H23 (window image), H24 (manikins) and H31 (fitting experience) as prop optimization directions will promote SMCS’ sales.

5. Conclusion and Implications

In this work, we propose research hypotheses based on theoretical analysis. Through a questionnaire survey, statistical analysis of SPSS and field experiments, we validate our hypotheses and get the following conclusions: (a) Display props can affect the purchase decision of consumers. (b) Improving visual impact and enhancing interactive experience have a positive effect on product sales. Small and medium-sized clothing stores should pay attention to the aesthetics, interest and functionality of display props. (c) Creating a display atmosphere, optimizing the space layout, strengthening the window image and enhancing the fitting experience are the methods of promoting the SMCS’ sales. Our conclusions provide a theoretical basis for green retailing in small and medium-sized clothing stores. In addition, the method combining questionnaire survey and field experiment is of great benefit.
to the research of clothing retailing. Our future work will use this method to study consumer behavior in more detail. In future applications, small and medium-sized clothing stores can use our conclusions to improve their sales and promote the green development of the local real economy.

References
[1] Kim Y K 2013 Korea Sci. Art Forum 14 77-90
[2] Saricam C, Okur N, Erdem D, Akdag S and Kilikci B E 2018 IOP Conf. Ser.: Mater. Sci. Eng. vol 460 (England: IOP Publishing) p 7
[3] Ahn H S and Kim H 2016 J. Dig. Des. 16 276-85
[4] Chen H and Ren L 2018 Management and Administration 5 127-30
[5] Francioni B, Savelli E, Cioppi M and Services C 2018 J. Retail. Consum. Serv. 43 333-41
[6] Qu Y F and Zhang R 2011 Textile Bioengineering and Informatics Symposium Proceedings vols 1-3, ed Y Li, Y F Liu, X N Luo and J S Li (TBIS) pp 1719-25
[7] Nobbs K, Foong K M and Baker J 2015 J. Glob. Fash. Mark. 6 4-19
[8] Seok S Y and Kim T 2012 Korean Inst. Inter. Des J. 21 96-105
[9] Gho K and Kim Y 2010 Journal of Fashion Business 14 35-48
[10] Chatterjee K N, Jhanji Y, Khanna S and Manocha A 2017 Manikins for textile evaluation (Sawston: Woodhead Publishing) pp 57-88
[11] Jiang L, Wang S Y and Xu W W 2009 Journal of Beijing Institute of Clothing Technology (Natural Science Edition) 29 59-66
[12] Grotenhuis M 2015 Basic SPSS Tutorial (California: SAGE Publications) pp 20-124
[13] Liu W M, Huang H Q and Ye F R 2020 Foreign Economics & Management 42 35-56