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A Study of Perceived Spaciousness in Product Display Visualization Types in Online Markets and Its Influence on Consumer Attitude*

- Focused on Korean Soup/Stew Products Targeting the Older Adults -

온라인 매장의 제품 시각 디스플레이 타입에서 지각된 공간감이 소비자태도에 미치는 영향에 대한 연구

- 고령층 대상의 국/찌개류 제품 중심으로 -

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Abstract

As the focus of food and grocery shopping platforms changes to online markets, older adults need support in adapting to the relatively unfamiliar environment despite their physical and psychological characteristics. While diverse types of product display visualization types exist in online point of sales, previous studies have stated how spacious an area or a visual influences the attention and attitude of the viewer. This study aimed to investigate how perceived spaciousness in the Korean soup/stew category product visualization types in online markets may influence older adults towards the attractiveness of the market, and to the attitude toward the online vendor. The research methods and contents comprise a literature study on the perceived spaciousness, perceived stress and anxiety, and characteristics of older adults, followed by a case study. Eight visual stimulants for a Likert scale online survey have been generated, they were divided into package types and food and package types and sub-categorized into more spacious or less spacious arrangements that were composed either with or without visual dominance in objects. Empirical analysis with verification of causal relationship using SPSS22.0 and Process Macro4.0. was processed, followed by ANOVA to analyze differences by visualization type. The study results found that perceived spaciousness and perceived stress or anxiety influence the attractiveness of the online market and attitude toward the online market, and the study proposes spacious visualization types for both packages and food and package types.

Keyword / Older Adult Consumers, Online Food Display, Online Display, Packaging Design, POS Design

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국문요약

식료품 쇼핑 플랫폼이 온라인으로 전환되며 고령층이 가진 신체적, 심리적 특성을 고려하여 이들이 비교적 낯선 환경에서의 구매활동 적응에 도움을 주는 연구가 필요하다. 온라인 매장에는 다양한 타입의 제품 디스플레이 시각화 유형들이 존재하며, 기존의 연구에 따르면 공간이나 시각적 요소는 소비자의 관심과 태도에 영향을 미친다고 하였다. 본 연구는 온라인 매장의 국/찌개 카테고리 제품의 시각화 유형들에서 인지된 공간감이 고령층의 온라인 매장에 대한 매력과 소비자태도에 어떤 영향을 미치는지를 찾는 것을 목표로 하였다. 연구방법과 내용은 고령층의 인지된 공간감, 인지된 스트레스와 불안감, 고령층의 특성에 대한 문헌연구 이후 사례연구로 구성되었다. 리커트 척도 온라인 설문 조사를 위한 8개의 시각 이미지가 제작 되었으며, 패키지 유형과 음식 및 패키지 유형으로 분류 되었고, 세부적으로는 시각적 중심이 있거나 시각적 중심이 없는 구성, 또한 공간감의 넓고 좁음으로 분류되었다. SPSS22.0과 Process Macro4.0을 활용한 인과관계 검증을 통한 실증분석 후 ANOVA를 통해 시각화 유형별 차이를 분석하였다. 결과, 인지된 공간감과 인지된 스트레스 혹은 불안감은 온라인 매장의 매력과 온라인 매장에 대한 소비자태도에 영향을 미치는 것으로 나타났으며, 최종적으로 지각된 공간감에 따른 효율적인 패키지와 음식 및 패키지 디스플레이 타입들을 제안한다.

중심어 / 고령층소비자, 온라인 식료품 디스플레이, 온라인 디스플레이, 패키징디자인, POS디자인

1. Introduction

We can see a variety of product displays in recent online food and grocery markets, and it is only adding its kind as more genres, categories, and menus emerge with the rapid shift to online food shopping platforms since COVID-19. Before COVID-19, online food and grocery shopping were the shopping platform choice mainly for younger generations, as older adults prefer to shop for food and groceries in offline markets for reasons including quality trust issues, technical difficulties, and more. However, with the start of COVID-19, online food shopping is not only for the younger consumer; older adults are shifting to online food shopping; in fact, we are heading towards online platform shopping on all kinds of purchases, that online shopping platforms must consider older adults consumers on plans and actions they take, as these group of consumers are the late-comers with low digital literacy, furthermore with relatively weaker physical and psychological states than younger shoppers.

Studies prove that visual displays for older shoppers in online markets should avoid complexity, keeping visualization types more simple to comprehend and recognize. This can be relatable to product description display types and how visuals are arranged in the online product display. The level of complexity in the visual description can be connected to how easy it is to recognize the product, whether one can easily recognize and check out the details of the product with less effort.

The psychological characteristic of older adults is that they are known to have difficulty in product quality trust compared to younger shoppers, and their physical characteristics are vulnerable that conducting product-to-product comparisons may be especially difficult. By this, online shopping itself may be stressful to the older adults than the younger shoppers. Seeking for effective visualization types for product description to include older shoppers by providing more convenience and leisureful time while shopping for food and grocery online is necessary for online vendors as it may influence the attraction and attitude toward the vendor.

1.1. Aims & Objectives

This study aims to investigate older adult consumers' reactions to product display image styles, how perceived spaciousness and perceived stress or anxiety of

product visual descriptions in online markets may affect the attractiveness of the market and, ultimately, its effect towards attitude towards the market.

The study's objective is first to study the previous literature on perceived spaciousness, perceived stress and anxiety caused by visual exposure, and characteristics of older consumers to build a theoretical background for the study. Second, analyze the currently existing market, gather information on currently used methods of food product display styles, and analyze and summarize existing visual display styles. Third, create samples of stimulants and survey questions according to the set hypothesis and study model and conduct a test survey with older adult participants. Lastly, provide a suggestion and a guideline of product visualization type/types for older adult consumers in online markets' food product display image choices.

1.2. Method of Study

This study was established to investigate the influence of perceived spaciousness in product visual description types in online markets towards the older adult consumers, how it can induce stress or anxiety that affect attractiveness and attitude towards the online vendor. After literature study and case study, an online survey that consisted of 8 stimulant visuals have been conducted with older adult participants in the ages 60's and 70's. To verify the causal relationship between the sense of space, stress, attractiveness, and attitude, data were processed using SPSS22.0 and Process Macro4.0. Analysis of variance (ANOVA) was processed to analyze differences in spatial sense by design type.

2. Literature Review

2.1. Perceived spaciousness

Perceived spaciousness is an impression of the size and openness of space. Hall (1966), who first studied the influence of the environment on sensory experience, said that the physical scale of space conveys different semantic associations to humans.[1] For example, a small chapel is reminiscent of stuffiness and limitation, while a huge cathedral is reminiscent of freedom and the infinity of the universe.

People feel freedom, openness, and comfort in spaces with large floor areas, windows, and high ceilings. Satisfaction with space leads to a higher sense of happiness and quality of life.[2]

The existence of negative space and white background has been emphasized in visual design; the foreground gains recognition as a foreground figure only when there is a broader background. As with most basics of visual perception, images must have a bigger proportion of background to avoid visual conflict between foreground and background; negative space creates viewers' focus on things we see.[3]

As previous literature explain, the sense of space in visual images or space in photographs creates a positive sensation to viewers, and the spaciousness of the background is essential for reducing visual conflict.

2.2. Perceived Stress and Anxiety

According to 'Proxemic Theory'[4], when a person is in a crowded space with many people, he/she generally feels more nervous and stressed than in an unoccupied space.[5] Also, even when a space is designed

1) Hall, E. (1966). *Hidden Dimension*. Garden City, NY: Doybleday.
2) Stamps III, A. E. (2010). Effects of Permeability on Perceived Enclosure and Spaciousness. Environment and Behavior, 42(6), pp,864-886.
3) Arnmehim, R. (2004). *Visual Thinking*. University of California Press.
4) Felipe, N. J., & Sommer, R. (1966). Invasions of Personal Space. *Social Problems, 14*(2), pp.206-214.

to be narrow or stuffy, people feel psychologically trapped in that space, resulting in increased tension and stress.[6] Sohn, Seegebarth, and Moritz (2017) presented results showing that the higher the 'visual complexity' of a mobile shopping site, the perceived spatial crowding, which reduces satisfaction and revisit intention.[7] Previous studies in space induced stress and anxiety suggests that a perceived spaciousness can affect an individual psychologically, when a perceived space is crowded or insufficient, it may evoke unpleasant feelings such as stress or anxiety.

2.3. Characteristics of Older Adults

According to 'The Simplicity Theory,' humans are susceptible to any complexity in discrepancy, and interest can be aroused around what appears to be "too simple".[8] One of the causes of difficulty in online shopping for older adults is their decline in cognitive abilities. Older consumers need help locating relevant product information with minimized complexity[9] as they are easily side-tracked and need help sticking to facts when examining product information.[10] Such characteristics make it challenging for older adults to understand product information in online products; therefore, studies explain that complexity should be reduced for older adults to gather product information without stress or difficulty. Reduced complexity may be relatable to the spaciousness of an image; when there is sufficient space, a foreground or an object is more accessible to identify.

3. Case Study

3.1. Analysis Method and Selection Standards of Examples

A case study was conducted in 2023. 12.01. to 2023. 12.10. South Korea's most widely used online food and grocery markets include Coupang, Naver Shopping, Market Kurly, and Emart SSG.com. Although there were online markets such as Homeplus Mall, GMarket, Auction, and 11st, there was a dramatic gap between the top 4 online malls.[11] The investigation category focused on gook/jjigae(stew), the top-selling category for the past few years.[12] All the gook/jjigae product description visualization types in the above-mentioned online markets have been analyzed.

3.2. Result of the Case Study

As the result of the case study, spaciousness and simplicity in package alone or food dish alone types were irrelevant to this study as there is only one object, and it was minimal without many differences in arrangement style. However, display images with multiple packages or mixed objects were placed, and different styles were found.

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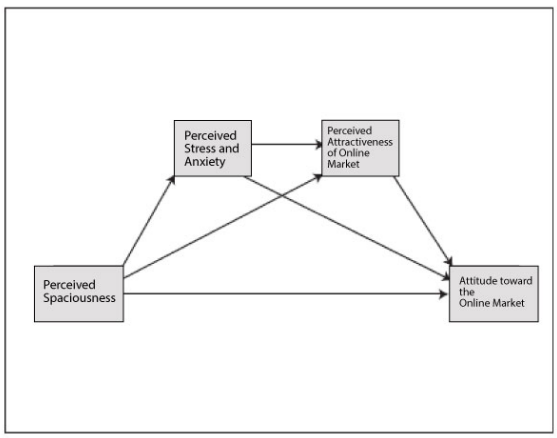
5) Maeng, A., & Tanner, R. (2011). Does a Crowded Store Lead to a Crowded Mind? Crowding and Mental Construal of Product Features. in NA. *Advances in Consumer Research, 39*.
6) Stamps III, A. E. (2011). Effects of Boundary Height and Horizontal Size within Boundary on Perceived Enclosure. *Perceptual and Motor Skills, 113*(3), pp.995-998.
7) Sohn, S., Seegebarth, B., & Moritz, M. (2017). The Impact of Perceived Visual Complexity of Mobile Online Shops on User's Satisfaction. *Psychology & Marketing, 34*(2), pp.195-214.
8) Chater, N. (1999). The Search for Simplicity: A Fundamental Cognitive Principle? *The Quarterly Journal of Experimental Psychology, 53*, pp.273-302.
9) Yoon, C., Cole, C. A., & Lee, M. P. (2009). Consumer Decision Making and Aging: Knowledge and Future Directions. *Journal of Consumer Psychology, 19*, pp.2-16.
10) Petty, R. E., & Cacioppo, J. T. (1986). The elaboration likelihood model of persuasion. *Advances in Experimental Social Psychology, 19*, pp.123-205.
11) Opensurvey. (2023). Online Food and Beverages Sales Trend Report 2023. *Opensurvey*.
12) Digital Today. (2023). Most Selling Category in Market Kurly? *Digital Today*.

When there are fewer packages or objects, background space has more significant variances with different zoom levels and arrangement styles, such as stacking; however, images with multiple objects tend to have crowded background space regardless of arrangement styles. Furthermore, regardless of the number of objects, displays were present with or without a visually dominant object. To categorize the existing product description visualization types, it can be divided into the list below:

a) Packages with more space without dominant object.
b) Packages with more space with dominant object.
c) Packages with less space without dominant object.
d) Packages with less space with dominant object.
e) Food and packages with more space without dominant object.
f) Food and packages with more space with dominant object.
g) Food and packages with less space without dominant object.
h) Food and packages with less space with dominant object.

4. Study Method

4.1. Study Model and Hypothesis



[Figure 1] Study Model

Above [Figure 1] is the study model, and the hypotheses are as follows.

H1. A sense of space affects stress.
H2. Space and stress affect attractiveness.
H2.1 A sense of space affects attractiveness.
H2.2 Stress affects attractiveness.
H3. Space, stress, and attractiveness influence attitude.
H3.1 Sense of space affects attitude.
H3.2 Stress affects attitudes.
H3.3 Attractiveness affects attitude.
H4. Stress and attractiveness have a mediating effect between sense of space and attitude.
H4.1 Stress has a mediating effect between sense of space and attitude.
H4.2 Attractiveness has a mediating effect between sense of space and attitude.
H4.3 Stress and attractiveness have a mediating effect between sense of space and attitude.

4.2. Sample Design

〈Table 1〉 Sample Stimulants

	Spaciousness			
a) Packages				
	More Spacious		Less Spacious	
	Without dominance	With dominance	Without dominance	With dominance
b) Package/s with food				
	More Spacious		Less Spacious	
	Without dominance	With dominance	Without dominance	With dominance

An online survey has been conducted from 2024. 02.01. to 2024. 02.08. via Google form, by 225 participants with experiences in online food and

grocery shopping in the Seoul and Gyeonggi region of Korea. Participants have been sent emails to the links to the survey with written description of how to complete the survey. Participants were requested to complete the survey as if they were in an online shopping environment, without time restrictions.

According to the result of the case study, total of 8 product display styles in the above 〈Table 1〉 were stimulants created for the survey. The selected menu for the survey was chosen as 'Galbitang', as it was the top selling item in the past year at Market Kurly, which is the top selling online food and grocery market in South Korea.[13] There were largely a) Packages and b) Food and packages, and were categorized into 'more spacious' and 'less spacious' layouts and arrangements, that were either with or without dominant figures in the photographs.

The stimulants were generated first by photographs and were retouched with Adobe Photoshop; the style of the display boxes and the layout style followed the style of Market Kurly, which the market had sold most galbitang products in the past year, 2023. The survey had 8 product description image styles that were randomly provided to each participant in the age range of 60s~70s. 5 point Likert chart has been created to measure the variables, as Likert-type scales are known to help measure latent constructs that are thought of as unobservable individual characteristics, without concrete, objective measurements, that are believed to exist and cause variations in behavior (Converse 1986). The response scales in the survey ar 1 being strongly disagree, 2 disagree, 3 neutral, 4 agree and 5 strongly agree. The survey was conducted with reference to the previous studies to measure each variables in the 〈Table 2〉.

〈Table 2〉 Measuring Qualities

Variable	Measuring Qualities	Sources
Perceived Spaciousness	The layout of the photograph is - Spacious - Widely Spread - Crowded	Herzog(1992); Okken, Rompay & Pruyn(2012)
Perceived Stress and Anxiety	The layout of the photograph makes me feel - Anxious - Frustrated - Angry	Brown & Ryan (2003); Diener & Emmons (1984)
Perceived Attractiveness of Online Market	- I like the space in the photograph - The space in the photograph gives good vibes - The space in the photograph is attractive	Grewal, Baker, Levy & Voss (2003)
Attitude Toward the Online Market	- I like/dislike the online market due to the photograph - The online market is attractive/not attractive due to the photograph - The photograph makes me feel positive/negative about the market	Eroglu, Machleit & Davis(2003); Yoo, Park & MacInnis(1998)

5. Test

5.1. Collection and General Characteristics of the Sample

〈Table 3〉 General Characteristics of the Sample

Participants	Categorization	Frequency	Percentage (%)
Sex	Male	97	43.1
	Female	128	56.9
Age	60's	97	43.1
	70's	128	56.9
Occupation	Production	32	14.2
	Self-Employed	65	28.9
	Professional Practitioner	32	14.2
	Housewife	64	28.4
	Sales/Service	32	14.2
Education	Highschool	64	28.4
	College Diploma	32	14.2
	University Graduation	96	42.7
	Above Graduate Studies	33	14.7
Income	Below 1 Million Won	32	14.2
	2~3 Million Won	64	28.4
	3~4 Million Won	32	14.2
	Above 5 Million Won	97	43.1
Shopping Frequency Per Month	Under 5 times	160	71.1
	Under 10 times	61	27.1
	Under 20 times	4	1.8

13) Digital Today. (2023). Most Selling Category in Market Kurly? *Digital Today*.

Of the 225 people who responded to the survey, 97 were men, 43.1% of the total, and 128 were women or 56.9% 〈Table 3〉. By age, 97 people were in their 60s, or 43.1% of the total, and those in their 70s were in their 70s. There were 128 people, or 56.9% of the total. By occupation, self-employed workers accounted for 28.9% of the total, homemakers accounted for 28.4%, and production, professional, and sales/service workers accounted for 14.2%. By educational level, 96 people graduated from college, or 42.7% of the total, followed by 64 people who graduated from junior college, or 28.4%. By monthly income, 97 people earned more than 5 million won, or 43.1% of the total, followed by 64 people, or 28.4%, who earned 2 to 3 million won. In terms of monthly online shopping frequency, those who shopped online less than five times were the most, with 160 people (71.1%), followed by those who shopped less than ten times, with 61 people or 27.1% of the total, and those who shopped less than 20 times with four people or 1.8% of the total.

5.2. Reliability and Validity Analysis of Measurement Tools

〈Table 4〉 is a table analyzing the reliability and validity of measurement tools for the research variables: sense of space, stress, attractiveness, and attitude. According to the table, the factor loading values were above 0.7, and the eigenvalues were 2.853 for spatial sense, 2.716 for stress, 2.812 for attractiveness, and 2.878 for attitude, all above 1.0. In addition, the variation explained power was 95.113% for space, 90.537% for stress, 93.747% for charm, and 95.941% for attitude, all above 50.0%, showing good reliability and validity of the research variable measurement tool. In addition, Cronbach's score was 0.974 for space, 0.941 for stress, 0.966 for attractiveness, and 0.979 for attitude, all above 0.7, showing good internal consistency of the measurement tool.

〈Table 4〉 Reliability and Validity Analysis of Measurement Tools

Measurement	Measurement Question	Factor Loading	Eigen Value	% Explained	Cronbach α
Perceived Spaciousness	a1	0.979	2.853	95.113	0.974
	a2	0.977			
	a3	0.970			
Perceived Stress and Anxiety	b1	0.972	2.716	90.537	0.941
	b2	0.957			
	b3	0.925			
Attractiveness	c1	0.980	2.812	93.747	0.966
	c2	0.967			
	c3	0.958			
Attitude	d1	0.983	2.878	95.941	0.979
	d2	0.982			
	d3	0.973			

5.3. Data Processing Method

To verify the causal relationship between the sense of space, stress, attractiveness, and attitude, data were processed using SPSS22.0 and Process Macro4.0. Frequency analysis was performed to identify the general characteristics of the sample using specific statistical methodology, and exploratory factor analysis was performed to analyze the reliability and validity of the measurement tool. In addition, the Cronbach value was obtained to determine the internal consistency of the measurement tool. Descriptive statistics such as mean and standard deviation were presented as a fundamental analysis of research variables, and the Pearson correlation coefficient was calculated to identify correlations between variables. Process Macro's Model 6 was applied to identify causal relationships between variables. Additionally, the mediation effect was calculated using Bootstrap. At this time, the sample number was 5,000. Lastly, analysis of variance (ANOVA) was conducted to analyze differences in spatial sense by design type, and the Duncan method was used for the post-hoc test.

6. Empirical Analysis

6.1. Basic Analysis of Research Variables

〈Table 5〉 summarizes descriptive statistics and correlations, including mean and standard deviation of the research variables: sense of space, stress, attractiveness, and attitude. According to the table, the average attitude was 3.38, and the average attractiveness was 3.36, higher than 'the average.' The average sense of space was 2.84, slightly lower than 'average.' The average stress level was 1.25, slightly higher than 'not very much.' Looking at the correlation between variables, stress had a significant negative correlation with sense of space, attractiveness, and attitude, and there was a significant positive correlation between sense of space, attractiveness, and attitude.

〈Table 5〉 Basic Analysis of Research Variables

Research Variables	Spaciousness	Stress and Anxiety	Attractiveness	Attitude
Spaciousness	1			
Stress and Anxiety	−.47**	1		
Attractiveness	.64***	−.50***	1	
Attitude	.63***	−.44***	.71***	1
M±s.d.	2.84±1.21	1.25±0.57	3.36±1.08	3.38±1.13

*p<.05, **p<.01, ***p<.001

6.2. Causal Relationship Verification

〈Table 6〉 Causal Relation Verification

Step	dependent	independent	B(s.e)	t-value	CI(95%)	Model Statistics
1	stress	constant	2.01(.08)	24.76***	1.85~2.17	R^2=.32. F=104.54***
		spaciousness	−.27(.03)	−10.22***	−.32~−.22	
2	attract	constant	1.91(.19)	10.34***	1.55~2.27	R^2=.74. F=307,50***
		spaciousness	.66(.04)	17.69***	.59~.74	
		stress	−.34(.08)	−4.35***	−.50~−.18	
3	attitude	constant	−.19(.14)	−1.35	−.47~.09	R^2=.90. F=687.49***
		spaceness	.11(.04)	2.88**	.03~.18	
		stress	−.12(.05)	−2.35*	−.22~−.02	
		attract	.93.(04)	21.88***	.85~1.01	

*p<.05, **p<.01, ***p<.001

〈Table 6〉 verifies the causal relationship between the sense of space, stress, attractiveness, and attitude. According to the table, there was a significant negative (−) influence of the first stage sense of space on stress, B=−0.27 (p<.001). In other words, stress significantly decreased as the sense of space increased. Therefore, hypothesis H1 was accepted. In stage 2, the effect of the sense of space on attractiveness had a significant favorable influence at B=0.66 (p<.001), but the effect of stress on attractiveness was significant at B=−0.34 (p<.001). There was a negative (−) influence. In other words, as the sense of space increased, attractiveness significantly increased, but as stress increased, attractiveness significantly decreased. Therefore, both Hypothesis H2.1 and Hypothesis H2.2 were accepted. In stage 3, the sense of space and attractiveness had a significant favorable influence on attitude at B=0.11 (p<.01) and B=0.93 (p<.001), but stress had a significant favorable influence on attitude at B=−0.12 (p<.05), there was a significant negative (−) influence. In other words, when the sense of space and attractiveness increased, attitude significantly increased, but when stress increased, attitude significantly decreased. Therefore, Hypothesis H3.1, Hypothesis H3.2, and Hypothesis H3.3 were accepted.

〈Table 7〉 Direct Effect and Indirect Effect

Effect	Paths	Effect size(s.e)	CI(95%)
Direct effect	space→attitude	.11(.04)	.03~.18
Total indirect effect		.74(.04)	.64~.85.
indirect effect	space→stress→attitude	.03(.01)	.01~.06
	space→attract→attitude	.62(.04)	.54~.70
	space→stress→attract→attitude	.09(.02)	.05~.13
total effect	direct+indirect	.85(.04)	.77~.91

*p<.05, **p<.01, ***p<.001

〈Table 7〉 is a table that verifies the indirect effects of stress and attractiveness in the effect of space on

attitude and analyzes the total effect. First, the direct effect of sense of space on attitude was B=.11, and at the 95% confidence level, the confidence interval did not include 0, which was significant. In the indirect effect, the mediating effect of the sense of space on attitude through stress is B=.03, the mediating effect on attitude through attractiveness is B=.62, and the indirect effect on attitude through stress and mediation is B=. 09, and the confidence interval did not include 0 at the 95% confidence level, so all results were significant. Therefore, hypothesis H41. Hypotheses H4.2 and H4.3 were both accepted. The total indirect effect was found to be B=.74. The total effect combining the direct effect and the indirect effect was B=.85. At the 95% confidence level, the confidence interval did not include 0, so all results were significant.

6.3. Analysis of Differences in Perceived Spaciousness by Visualization Types

The previous analysis revealed that the sense of space in the design plays a vital role, directly or indirectly, in consumers' stress, attractiveness, and attitude. Therefore, an analysis comparing the sense of space by design type is necessary. 〈Table 8〉 shows the results of the analysis of variance (ANOVA) to analyze differences in spatial sense by design type. As a result of the analysis, F=103.466 ($p<.001$), it was found that there was a significant difference in the sense of space by design type. In addition, as a result of Duncan's post hoc test, Design 1-2 had a very high average of 4.14 and Design 2-1 had an average of 4.29, followed by Design 1-1 with an average of 3.57, and Design 2-2 ad average of 3.05 and Design 1-3 followed by an average of 2.86. Meanwhile, Designs 1-4 had the lowest sense of space, with an average of 1.38, and Designs 2-4 had an average of 1.54.

〈Table 8〉 Analysis of Differences in Perceived Spaciousness by Visualization Types

Visualization Style	Mean	Standard Deviation	*F*-value	*p*-value	Post-hoc test
1-1	3.57	0.43	103.466	0.000***	(1-4=2-4) 〈(2-3) 〈(1-3=2-2) 〈(1-1) 〈(1-2=2=2)
1-2	4.14	0.54			
1-3	2.86	0.81			
1-4	1.38	0.59			
2-1	4.29	0.22			
2-2	3.05	0.86			
2-3	1.95	0.56			
2-4	1.54	0.47			

7. Conclusion

As online shopping becomes the primary platform for food and grocery purchases, studies should consider ways to include diverse consumers, especially vulnerable persons such as older adults. The group has weaker physical and psychological conditions than the younger generations, making their shopping experience more difficult because it takes more time and effort to recognize and make meaningful analyses and decisions between products. It is even more necessary to find ways to invite older adults to online food and grocery shopping, as online grocery shopping is the primary option, and offline market shopping for the elderly is physically challenging due to the difficulty in delivering the products to home.

To encourage and invite older adults to their food and grocery online shopping, visual product descriptions must consider factors such as perceived spaciousness and perceived stress or anxiety in what the shoppers see in their markets and if the images provided are distracting consumers from focusing on the products or even the image itself is distracting psychologically. This may be important for all kinds of consumers as markets should always seek ways to invite consumers. However, this is especially critical for older people with their physical and psychological characteristics and lack of experience in the digital environment.

As the result of the study suggests, perceived spaciousness in product display visuals may support older adults in having more leisure time and less stress while shopping for food online. Visualization types should include fewer items in the visual arrangements for perceived spaciousness; however, visual dominance was not necessary for perceived spaciousness for most stimulant types. Even when there was dominance in a layout, it did not always lead to an improved perception of spaciousness. For multiple packages with more space, visual dominance in a stacked package type was effective; however, when there were multiple packages with less background space, visual dominance did not influence perceived spaciousness as much. For food and packages, more spaciousness without dominance was most effective, and when there were multiple mixed food and package objects with less space, visual dominance did not influence perceived spaciousness as much.

To summarize, for product visualizations of packages only, more spacious with dominance was most effective in terms of perceived spaciousness, which led to positive attractiveness and attitude toward the online vendor. For food and package visualizations, more spaciousness without dominance was most effective in terms of perceived spaciousness, which led to positive attractiveness and attitude toward the online vendor. Below 〈Table 9〉 provides recommended product display visualization types for online food products for older adult consumers.

〈Table 9〉 Suggestion of Product Display Images

Packages	Food and Package
	
More Spacious with dominance	More Spacious without dominance

7.1. Implication of Study

The study can be supportive material for online food and grocery market vendors with much older adult consumers or who wish to bring more older consumers to their markets. Planning and arranging for gook/jjigae(Korean stew) product description visuals in spacious layouts with dominant focus will encourage older adult consumers to shop with less stress or anxiety and find the market attractive, which is connected to attitude towards the market.

7.2. Limitation and Proposal of Further Study

The study primarily focused on gook/jjigae(Korean stew) category of products which is generally packaged in sealed pouch types with less structural forms and broad graphic layout surfaces. Product categories in other food kinds or package materials may have different results with this specific study.

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