

## Study on a model of street vended food choices by Korean high school students

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### Abstract

Street vended food (SVF) includes food and beverages prepared and sold outdoors or in public areas by street merchants for consumption on the scene or later without further preparation. Due to its low price and convenience, SVF has been popular in Korea for a long time, particularly with high school students. Beyond Korea, SVF is also popular in southeast Asia and southern Africa in the form of ready-to-eat food. This study on high school students, who are main consumers of SVF in Korea, focused on the factors that affect consumer loyalty. The study was performed by questionnaire and used AMOS software to develop a structural equation model. The results of verifying the model's fidelity were  $\chi^2 = 685.989$ ,  $df = 261$ ,  $GFI = 0.851$ ,  $AGFI = 0.814$ ,  $NFI = 0.901$ ,  $CFI = 0.907$ ,  $RMR = 0.048$ , indicating a satisfying structural model. SVF quality and service, emotional response, and the physical environment had a statistically significant effect on consumer loyalty. In contrast, SVF sanitation had no statistically significant effect on consumer loyalty. Based on these results, the sanitary management of SVF needs to be addressed immediately combined with education for SVF providers to maintain a clean environment.

**Key Words:** SVF (Street Vended Food), AMOS, consumer loyalty, sanitation

### Introduction

Street vended food (SVF) includes food and beverages that are prepared and sold outdoors or in public spaces by street merchants for consumption on the scene or later without further preparation [1]. SVF is usually cheap and convenient with unique attributes that make it popular. Business start-up costs are also low making it a popular and important business model, a source of income, and a jobs creator [2]. In Korea, SVF is an attractive and popular distraction and offers unique tastes with a friendly atmosphere, making it popular among tourists and regular folk [3]. SVF is also popular in southeast Asia and southern Africa in the form of ready-to-eat food and is inexpensive with lots of variety, making it a popular snack and a substitute for meals [4]. However, SVF has a negative reputation and image of being nutritionally unbalanced and unsanitary; thus, SVF vendors are regularly inspected or banished [5].

The regulatory definition for street vendors differs between government agencies, and the statistics vary; thus, a definitive report on the state of SVF sales is difficult to find. Nevertheless, the period during the early to mid 1990s saw a decrease in street vendors until 1998 when the foreign currency crisis occurred, and a large increase in street vendors was seen. Thus, the number of street vendors has varied with the economic and social environment and its scope is expected to expand [2].

SVF has not been well studied in Korea. Notable studies have mostly focused on SVF consumption and status [3-7] followed by studies on sanitary management [2,6] and nutritional value [8]. But, studies on SVF consumers are absent. Food prepared and sold on streets or in public areas by street vendors is almost entirely determined to be illegal by national law [2], but a clear definition is absent, so control has been intermittent; thus, SVF continues to be sold. Even the Korean Food and Drug Administration (KFDA) in 2008 prepared and distributed nationwide picture manuals on the sanitary management of SVF for merchants.

Point of service is an important factor that directly and indirectly influences consumer satisfaction at the moment of service and, thus, holds an important position in marketing [9]. The point of service begins with the face-to-face contact between the seller and consumer, and this person-to-person interaction has a major influence on consumer satisfaction [10]. The point of service can be divided into interactions with the seller and the physical environment [11,12]. The evaluation by the consumer of the service they receive is an indication of the overall evaluation of the seller or corporate entity and is a fundamental element that makes up consumer satisfaction [10].

This study investigated the consumption of SVF by high school students who have easy access to SVF. The level of quality, service, and satisfaction with SVF were measured, and a way

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to increase consumer satisfaction through quality improvements is presented.

## Subjects and Methods

### *Investigated subjects and investigation period*

This study was performed by questionnaire between October 4 and 14, 2010 with randomly selected high school students residing in the Seoul metropolitan area. In total, 320 questionnaire were distributed, and 310 were returned (response rate, 96.9%).

### *Investigated content and data collection*

The questionnaire was developed and refined considering previous studies on SVF [6,7] and the research on point of service factors and consumer satisfaction [13-17]. The structure of the questionnaire was divided into general questions, consumption of SVF, questions on the point of service and its quality as well as consumer satisfaction. Responses to questions on SVF quality, point of service, and satisfaction were scored using a five-point Likert scale, with 1 indicating strong disagreement and 5 indicating strong agreement.

### *Statistical analysis*

The scores were analyzed using PASW 18.0 (SPSS, Inc., Chicago, IL, USA). The correlation between consumption of SVF and general factors was investigated to determine the relationship between the two. The relationships between general factors and perceived quality of SVF, point of service factors, and consumer satisfaction were analyzed with an analysis of variance (ANOVA) and a t-test. A Duncan's multiple range test was performed to verify the group results. Analyses on causal factors were performed to verify the results on perceived SVF quality and consumer satisfaction. The responses were also analyzed using AMOS (v. 18.0) to verify the confirmatory factor analysis and structural equation model [18].

## Results

### *Consumption of SVF*

The results on consumption of SVF are presented in Table 1. A significant difference was observed between the genders for frequency, preferred SVF, persons interacting with the consumer, level of preference, reasons for liking or disliking SVF, and average cost per purchase. The frequency of purchase was highest at 1-2 times per week for women (62.4%), which was higher than that of men (40.4%), and men (25.8%) responded that they do not consume SVF more often than that of women

(18.6%). Previous studies [5] on middle school and university students in the Seoul area showed that 43.5% of high school students consume SVF more than 4-5 times per month, which is higher than that for middle school and university students. This was consistent with the results of this study and confirmed the high frequency of SVF purchases by high school students. The foods of choice 2-3 times a week were Ddukbokki, Sundae, and Uhmok, and more women (80.5%) than men (56.2%) purchased them. Those making SVF purchases were mostly friends with women (89.1%), which was higher than that of men (69.7%). In contrast, purchases made alone or with family were significantly higher for men than those for women ( $P < 0.001$ ). The level of preference was higher for women than that for men and indications of no preference or dislike were significantly higher for men than those for women ( $P < 0.05$ ). Among men, only 26.8% stated that they liked SVF because of its easy access, which was the top response, compared to 34.6% of women. This reason was followed by SVF being a substitute for a regular meal, and 25.4% of men and 22.9% of women stated this as their reason. The low cost of SVF was the third reason for 22.3% of women compared to 19.7% of men. The response of easy access as the top reason was consistent with the results obtained by [3] whose study was performed on university students. The top reason for disliking SVF was its unsanitary status by 72.9% of women and 34.1% of men ( $P < 0.01$ ). The unsanitary status of SFVs was the top reason, which was consistent with previous studies [4] and [5]. The average budget per SFV purchase was 1,000-2,000 for 48.3% of men and 30.3% of women ( $P < 0.01$ ). The next highest response was 2,000-3,000 for women (39.4%), which was greater than that of men (33.7%). Overall, these two budget ranges combined made up 70% of the responses. This was also consistent with previous results [4] in which 71.79% of respondents used 1,000-3,000 as a budget range per purchase.

Significant differences were also found for the type of preferred SVF and the people taking part in the purchase when the average monthly allowance was considered. Of those who most frequently purchased Ddukbokki, Sundae, and Uhmok, the average monthly allowance was 40,000-60,000 for 81.1% of the respondents. The lowest group was those with monthly allowances < 20,000 at 53.1% ( $P < 0.01$ ). The number of respondents who purchased SVF with friends was less for those with monthly allowances < 40,000 compared to those with higher monthly allowances ( $P < 0.001$ ). Of those who purchased SFV alone, the smallest group was those with monthly allowances < 20,000 at 18.8% ( $P < 0.01$ ).

### *Quality of SVF, point of service, and consumer satisfaction*

The SVF results by gender and monthly allowance are given in Table 2. Overall, the response to "SVF is sanitary" had the lowest score of 2.27. The next lowest was for the "environment in which SVF is sold is sanitary", which scored 2.39 followed by "utensils served with SVF are sanitary" (2.55), "I will still buy SVF even if the cost rises" (2.63) "and providers of SFV

**Table 1.** Consumption of street vended food

		Gender			Monthly allowance (₩)							N (%)
		Men	Women	Total	$\chi^2$	Under 20,000	20,000-40,000	40,000-60,000	Over 60,000	Total	$\chi^2$	
Frequency	Do not consume	23 (25.8)	41 (18.6)	64 (20.6)	15.417**	16 (25.0)	17 (19.8)	13 (17.6)	6 (10.5)	52 (18.5)	12.320	
	1-2times a week	36 (40.4)	138 (62.4)	174 (56.1)		28 (43.8)	52 (60.5)	42 (56.8)	38 (66.7)	160 (56.9)		
	3-4times a week	17 (19.1)	30 (13.6)	47 (15.2)		13 (20.3)	13 (15.1)	9 (12.2)	9 (15.8)	44 (15.7)		
	5-6times a week	8 (9.0)	6 (2.7)	14 (4.5)		4 (6.3)	2 (2.3)	6 (8.1)	2 (3.5)	14 (5.0)		
	Over 7times a week	5 (5.6)	6 (2.7)	11 (3.5)		3 (4.7)	2 (2.3)	4 (5.4)	2 (3.5)	11 (3.9)		
Preferred SVF <sup>1)</sup>	Ddukbokki, Sundae, Uhmok	50 (56.2)	178 (80.5)	228 (73.5)	27.370***	34 (53.1)	68 (79.1)	60 (81.1)	45 (78.9)	207 (73.7)	30.154**	
	Hotteok	3 (3.4)	1 (0.5)	4 (1.3)		0 (0.0)	1 (1.2)	1 (1.4)	2 (3.5)	4 (1.4)		
	Bungeoppang	5 (5.6)	8 (3.6)	13 (4.2)		3 (4.7)	4 (4.7)	2 (2.7)	2 (3.5)	11 (3.9)		
	Toast	3 (3.4)	11 (5.0)	14 (4.5)		4 (6.3)	3 (3.5)	5 (6.8)	2 (3.5)	14 (5.0)		
	Etc.	28 (31.5)	23 (10.4)	51 (16.5)		23 (35.9)	10 (11.6)	6 (8.1)	6 (10.5)	45 (16.0)		
Companion	Alone	9 (10.1)	8 (3.6)	17 (5.5)	18.183***	12 (18.8)	0 (0.0)	1 (1.4)	2 (3.5)	15 (5.3)	47.388***	
	Family	14 (15.7)	14 (6.3)	28 (9.0)		6 (9.4)	14 (16.3)	2 (2.7)	3 (5.3)	25 (8.9)		
	Friend	62 (69.7)	197 (89.1)	259 (83.5)		43 (67.2)	72 (83.7)	68 (91.9)	52 (91.2)	235 (83.6)		
	Etc.	4 (4.5)	2 (0.9)	6 (1.9)		3 (4.7)	0 (0.0)	3 (4.1)	0 (0.0)	6 (2.1)		
Location of the street stall	By main roads	43 (48.3)	92 (41.6)	135 (43.5)	6.633	30 (46.9)	41 (47.7)	31 (41.9)	22 (38.6)	124 (44.1)	14.464	
	In alleys	11 (12.4)	20 (9.0)	31 (10.0)		2 (6.7)	10 (11.6)	11 (14.9)	7 (12.3)	30 (10.7)		
	In residential streets	7 (7.9)	10 (4.5)	17 (5.5)		1 (1.6)	8 (9.3)	3 (4.1)	4 (7.0)	16 (5.7)		
	In shopping streets	21 (23.9)	84 (38.0)	105 (33.9)		25 (39.1)	22 (25.6)	24 (32.4)	22 (38.6)	93 (33.1)		
	Etc.	7 (7.9)	15 (6.8)	22 (7.1)		6 (9.4)	5 (5.8)	5 (6.8)	2 (3.5)	18 (6.4)		
Degree of preference	Dislike very much	9 (10.1)	7 (3.2)	16 (5.2)	10.371*	5 (7.8)	1 (1.2)	4 (5.4)	2 (3.5)	12 (4.3)	8.062	
	Dislike	10 (11.2)	15 (6.8)	25 (8.1)		6 (9.4)	7 (8.1)	6 (8.1)	4 (7.0)	23 (8.2)		
	Indifferent	43 (48.3)	108 (48.9)	151 (48.7)		34 (53.1)	43 (50.0)	31 (41.9)	27 (47.4)	135 (48.0)		
	Like	24 (27.0)	73 (33.0)	97 (31.3)		16 (25.0)	27 (31.4)	27 (36.5)	20 (35.1)	90 (32.0)		
	Like very much	3 (3.4)	18 (8.1)	21 (6.8)		3 (4.7)	8 (9.3)	6 (8.1)	4 (7.0)	21 (7.5)		
Reasons for liking SVF	Cheap price	14 (19.7)	40 (22.3)	54 (21.6)	12.391*	12 (25.5)	14 (20.3)	12 (19.0)	11 (21.6)	49 (21.3)	9.607	
	Economy of time	10 (14.1)	5 (2.8)	15 (6.0)		5 (10.6)	4 (5.8)	4 (6.3)	2 (3.9)	15 (6.5)		
	Accessibility	19 (26.8)	62 (34.6)	81 (32.4)		18 (38.3)	21 (30.4)	19 (30.2)	14 (27.5)	72 (31.3)		
	Can eat anytime	18 (25.4)	41 (22.9)	59 (23.6)		7 (14.9)	15 (21.7)	16 (25.4)	17 (33.3)	55 (23.9)		
	Others	10 (14.1)	31 (17.3)	41 (16.4)		5 (10.6)	15 (21.7)	12 (19.0)	7 (13.7)	39 (17.0)		
	Total	71 (28.4)	179 (71.6)	250 (100.0)		47 (20.4)	69 (30.0)	63 (27.4)	51 (22.2)	230 (100.0)		
Reasons for disliking SVF	Unsanitary	14 (34.1)	62 (72.9)	76 (60.3)	19.069**	17 (54.8)	13 (44.8)	18 (69.2)	18 (72.0)	66 (59.5)	16.477	
	Taste	8 (19.5)	4 (4.7)	12 (9.5)		2 (6.5)	6 (20.7)	2 (7.7)	1 (4.0)	11 (9.9)		
	No companion	3 (7.3)	4 (4.7)	7 (5.6)		1 (3.2)	3 (10.3)	3 (11.5)	0 (0.0)	7 (6.3)		
	Lack of menu	7 (17.1)	8 (9.4)	15 (11.9)		6 (19.4)	2 (6.9)	2 (7.7)	4 (16.0)	14 (12.6)		
	Etc.	9 (22.0)	7 (8.2)	16 (12.7)		5 (16.1)	5 (17.2)	1 (3.8)	2 (8.0)	13 (11.7)		
	Total	41 (32.5)	85 (67.5)	126 (100.0)		31 (27.9)	29 (26.1)	26 (23.4)	25 (22.5)	111 (100.0)		
Average budget per purchase (₩)	Under 1,000	2 (2.2)	32 (14.5)	34 (11.0)	16.319**	9 (14.1)	12 (14.0)	9 (12.2)	3 (5.3)	33 (11.7)	10.440	
	1,000-2,000	43 (48.3)	67 (30.3)	110 (35.5)		22 (34.4)	30 (34.9)	27 (36.5)	19 (33.3)	98 (34.9)		
	2,000-3,000	30 (33.7)	87 (39.4)	117 (37.7)		25 (39.1)	31 (36.0)	23 (31.1)	27 (47.4)	106 (37.7)		
	3,000-4,000	9 (10.1)	28 (12.7)	37 (11.9)		8 (12.5)	8 (9.3)	12 (16.2)	6 (10.5)	34 (12.1)		
	Over 4,000	5 (5.6)	7 (3.2)	12 (3.9)		0 (0.0)	5 (5.8)	3 (4.1)	2 (3.5)	10 (3.6)		
Total		89 (28.7)	221 (71.3)	310 (100.0)		64 (22.8)	86 (30.6)	74 (26.3)	57 (20.3)	281 (100.0)		

\* $P < 0.05$ , \*\* $P < 0.01$ , \*\*\* $P < 0.001$

SVF<sup>1)</sup>: street vended food

are sanitary” (2.69). All responses to sanitation and cleanliness questions except those related to cost were low, indicating a negative opinion of SFV on those topics. This result was similar to the results obtained by [6] on middle school and university students and [3] on university students alone. In contrast, the response to “stores selling SVF are easily accessible” scored the

highest with 3.64. followed by “I am satisfied with SVF” (3.49), “I do not think consuming SFV is a waste of time” (3.47), “I am satisfied with the taste of SVF” (3.40), “The location of SVF stores is appropriate” (3.39) and “I will continue to consume SVF” (3.35). Thus, despite their dissatisfaction with SVF sanitation and cleanliness, they considered SVF easy to access, were

**Table 2.** Quality of street vended food, the point of service, and consumer satisfaction

	Gender		t-value	Monthly allowance (₹)				F-value	Average
	Men (n = 89)	Women (n = 221)		Under 20,000 (n = 64)	20,000- 40,000 (n = 86)	40,000- 60,000 (n = 74)	Over 60,000 (n = 57)		
				Mean ± SD					
The locations of the street stalls are adequate.	3.25 ± 1.03	3.45 ± 0.80	-1.84*	3.30 ± 0.89 <sup>a</sup>	3.31 ± 0.83 <sup>a</sup>	3.41 ± 0.79 <sup>a</sup>	3.42 ± 0.86 <sup>b</sup>	3.84*	3.39 ± 0.87
The street stalls are accessible.	3.35 ± 1.00	3.75 ± 0.79	-3.73**	3.38 ± 0.86 <sup>a</sup>	3.41 ± 0.99 <sup>a</sup>	3.85 ± 0.66 <sup>b</sup>	4.04 ± 0.78 <sup>b</sup>	10.113***	3.64 ± 0.88
The SVF <sup>1</sup> is sanitary.	2.47 ± 0.88	2.19 ± 0.78	2.74	2.45 ± 0.82	2.22 ± 0.79	2.14 ± 0.75	2.21 ± 0.82	2.02	2.27 ± 0.82
The providers of SVF are sanitary.	2.78 ± 0.89	2.66 ± 0.76	1.14	2.67 ± 0.84	2.69 ± 0.77	2.62 ± 0.82	2.77 ± 0.78	0.38	2.69 ± 0.80
The places where SVF is served are sanitary.	2.69 ± 0.99	2.28 ± 0.83	3.35*	2.56 ± 0.92 <sup>b</sup>	2.53 ± 0.85 <sup>b</sup>	2.11 ± 0.79 <sup>a</sup>	2.25 ± 0.91 <sup>ab</sup>	4.53**	2.39 ± 0.89
The tablewares are sanitary.	2.80 ± 1.04	2.45 ± 0.81	2.79*	2.63 ± 0.90	2.62 ± 0.87	2.35 ± 0.85	2.44 ± 0.87	1.79	2.55 ± 0.89
The time consumed for SVF is not a waste.	3.33 ± 0.98	3.53 ± 0.81	-1.85	3.05 ± 1.07 <sup>a</sup>	3.53 ± 0.84 <sup>b</sup>	3.64 ± 0.75 <sup>b</sup>	3.60 ± 0.78 <sup>b</sup>	6.47***	3.47 ± 0.87
The services related to SVF are good.	3.07 ± 0.94	3.10 ± 0.76	-0.25	2.85 ± 0.96 <sup>a</sup>	3.15 ± 0.74 <sup>b</sup>	3.10 ± 0.82 <sup>ab</sup>	3.34 ± 0.69 <sup>b</sup>	3.67*	3.09 ± 0.81
The consumption of SVF itself is pleasing that it makes me comfortable.	2.73 ± 0.99	2.83 ± 0.88	-0.91	2.69 ± 1.04	2.82 ± 0.83	2.88 ± 0.93	2.89 ± 0.91	0.65	2.80 ± 0.91
The prices are adequate.	3.07 ± 0.97	3.29 ± 0.79	-2.04	2.77 ± 0.87 <sup>a</sup>	3.38 ± 0.89 <sup>bc</sup>	3.23 ± 0.83 <sup>b</sup>	3.54 ± 0.68 <sup>c</sup>	10.32***	3.22 ± 0.85
SVF pleases me.	2.78 ± 1.06	3.10 ± 0.87	-2.52**	2.84 ± 1.13	3.10 ± 0.87	3.07 ± 0.89	3.14 ± 0.89	1.29	3.00 ± 0.94
SVF makes me happy.	2.65 ± 1.07	3.04 ± 0.84	-3.03***	2.83 ± 1.13	3.03 ± 0.87	2.99 ± 0.87	3.05 ± 0.89	0.78	2.93 ± 0.93
SVF satisfies me.	2.84 ± 1.06	3.04 ± 0.88	-1.55**	2.86 ± 1.15	3.05 ± 0.92	2.99 ± 0.80	3.21 ± 0.90	1.44	2.98 ± 0.94
The tastes of SVF are satisfying.	3.43 ± 0.95	3.39 ± 0.77	0.29*	3.20 ± 0.98 <sup>a</sup>	3.51 ± 0.81 <sup>b</sup>	3.38 ± 0.81 <sup>ab</sup>	3.61 ± 0.65 <sup>b</sup>	2.96*	3.40 ± 0.82
The conditions of SVF served are satisfying.	3.02 ± 0.86	3.10 ± 0.75	-0.83	2.95 ± 0.89	3.15 ± 0.71	3.08 ± 0.72	3.19 ± 0.77	1.19	3.08 ± 0.78
The providers are friendly.	3.29 ± 0.96	3.23 ± 0.81	0.55	2.89 ± 0.92 <sup>a</sup>	3.40 ± 0.96 <sup>b</sup>	3.26 ± 0.69 <sup>b</sup>	3.44 ± 0.71 <sup>b</sup>	5.68**	3.25 ± 0.86
Facilities such as tableware are well equipped.	3.10 ± 0.85	2.99 ± 0.75	1.17	2.91 ± 0.81	3.01 ± 0.82	3.05 ± 0.79	3.12 ± 0.71	0.81	3.02 ± 0.78
The overall services related to SVF are satisfying.	3.19 ± 0.88	3.07 ± 0.69	1.14**	2.91 ± 0.85 <sup>a</sup>	3.16 ± 0.72 <sup>ab</sup>	3.11 ± 0.67 <sup>ab</sup>	3.30 ± 0.71 <sup>b</sup>	3.01*	3.11 ± 0.75
The SVF is satisfying.	3.10 ± 0.87	3.23 ± 0.72	-1.31	3.03 ± 0.84	3.27 ± 0.79	3.18 ± 0.65	3.39 ± 0.70	2.49	3.49 ± 0.76
The consumption of SVF is satisfying.	3.24 ± 0.89	3.26 ± 0.69	-0.22**	3.06 ± 0.83 <sup>a</sup>	3.40 ± 0.72 <sup>bc</sup>	3.18 ± 0.67 <sup>ab</sup>	3.47 ± 0.66 <sup>c</sup>	4.48**	3.25 ± 0.75
The providers of SVF are satisfying.	3.13 ± 0.86	3.09 ± 0.71	0.47*	2.94 ± 0.79 <sup>a</sup>	3.19 ± 0.76 <sup>ab</sup>	3.06 ± 0.71 <sup>ab</sup>	3.32 ± 0.69 <sup>b</sup>	3.03*	3.10 ± 0.75
I will continue consuming SVF.	3.17 ± 0.83	3.42 ± 0.82	-2.41	3.20 ± 0.98	3.46 ± 0.79	3.42 ± 0.77	3.52 ± 0.71	1.67	3.35 ± 0.83
I will still buy SVF even if the prices rise.	2.67 ± 1.03	2.61 ± 0.87	0.53*	2.50 ± 0.79	2.69 ± 0.91	2.72 ± 0.89	2.82 ± 0.93	1.43	2.63 ± 0.92
I would like to introduce SVF to a friend.	2.84 ± 1.08	2.86 ± 0.91	-0.14	2.59 ± 0.97 <sup>a</sup>	2.92 ± 0.98 <sup>b</sup>	3.03 ± 0.91 <sup>b</sup>	3.07 ± 0.92 <sup>b</sup>	3.28*	2.85 ± 0.96
I am willing to speak positively of SVF.	2.98 ± 1.15	3.06 ± 0.87	-0.64***	2.69 ± 0.97 <sup>a</sup>	3.19 ± 0.98 <sup>bc</sup>	3.05 ± 0.87 <sup>b</sup>	3.39 ± 0.82 <sup>c</sup>	6.40***	3.04 ± 0.96

\* $P < 0.05$ , \*\* $P < 0.01$ , \*\*\* $P < 0.001$ <sup>ab,c</sup> Duncan's multiple range testSVF<sup>1</sup>: street vended food

satisfied with the taste, and will continue to purchase SVF.

Women responded higher to “location of SVF stores is appropriate” ( $P < 0.05$ ) and “stores selling SVF are easily accessible” ( $P < 0.01$ ). The response to “the environment in which SVF is sold is sanitary by women” was lower (2.28) compared to that of men (2.69) as well as to “utensils served with SVF are sanitary” ( $P < 0.05$ ). In contrast, the response to “SVF provides me pleasure” ( $P < 0.01$ ), “SVF makes me happy” ( $P < 0.001$ ), and “SVF satisfies me” were higher for women than for men. Men (3.43) showed a higher score for taste satisfaction than that of women (3.39) as well as for the overall level of service, with men scoring 3.19 and women scoring 3.07. Overall satisfaction for SVF purchases was higher for women (3.26) than those for men (3.24), although satisfaction with SVF providers was higher for men (3.13) than that for women (3.09). Men responded more to “I will still buy SVF even if the cost rises” ( $P < 0.05$ ) and women responded more to “I am willing to give a positive opinion of SVF” ( $P < 0.001$ ).

When analyzing the differences in the responses to monthly average allowance, the higher the allowance, the higher the scores

were for “the locations of the SVF stores are appropriate” ( $P < 0.05$ ), and “stores selling SVF are easily accessible” ( $P < 0.001$ ). For the question “the environment in which SVF is sold is sanitary”, students with lower allowances showed higher scores ( $P < 0.01$ ). Those with allowances  $< 40,000$  gave lower scores to the question “I do not think consuming SFV is a waste of time” than that of the other groups ( $P < 0.001$ ). Students with larger allowances provided higher scores on the question “the service related to SVF is good” ( $P < 0.05$ ) as well as to the questions “the cost of SVF is appropriate” ( $P < 0.001$ ), “I am satisfied with the taste of SVF” ( $P < 0.05$ ), and “providers of SVF are friendly” ( $P < 0.01$ ). These correlations were consistent with responses to the general questions “I am satisfied with overall SVF service” ( $P < 0.05$ ) and “I am satisfied with the SFV purchase” ( $P < 0.01$ ) which received higher scores from those with higher allowances. The scores provided by those with allowances  $< 20,000$  to the question “I am satisfied with the providers of SVF” were lower compared to those with allowances  $> 60,000$  ( $P < 0.05$ ). Students with allowances  $< 20,000$  also gave lower scores to the question “I wish to introduce friends to SFV”

**Table 3.** Reliability and exploratory factor analyses

	Factor1	Factor 2	Factor 3	Factor 4	Factor 5
The services related to SVF <sup>1)</sup> are good.	0.739				
Providers of SVF are friendly.	0.653				
I do not think consuming SVF is a waste of time.	0.624				
I am satisfied with the providers of SVF.	0.586				
I am satisfied with the taste of SVF.	0.581				
I am satisfied with the purchase of SFV.	0.564				
I am satisfied with the overall service of SVF.	0.552				
The condition of SVF served is satisfactory.	0.538				
The cost of SVF is adequate.	0.459				
Utensils and facilities for consuming SVF are well prepared.	0.434				
SVF provides me pleasure.		0.878			
SVF makes me happy.		0.873			
SVF satisfies me.		0.846			
Consuming SVF in itself is fun and comforting.		0.492			
I would like to introduce SVF to friends.			0.773		
I will continue to consume SVF.			0.750		
I am willing to speak positively of SVF.			0.684		
I will still buy SVF even if the cost rises.			0.619		
I am satisfied with SVF.			0.524		
The environment in which SVF is sold is sanitary.				0.875	
Utensils served with SVF are sanitary.				0.817	
SVF is sanitary.				0.812	
Providers of SFV are sanitary.				0.775	
The location of SVF stores is appropriate.					0.889
Stores selling SVF are easily accessible.					0.854
Factor loading	4.262	3.490	3.395	3.341	1.862
Percent accumulation	17.049	31.010	44.591	57.956	65.405
Cronbach's alpha	0.880	0.905	0.836	0.878	0.782

SVF<sup>1)</sup>: street vended food

than that of other groups ( $P < 0.05$ ). Scores to the question “I am willing to give a positive opinion of SVF” rose as the average monthly allowance rose ( $P < 0.001$ ).

#### Reliability and accuracy of the questionnaire results

To verify the reliability and accuracy of the questionnaire results, reliability analysis and investigative factor analysis were performed, and the results are shown in Table 3. After conducting a factor analysis on the 25 questions, five primary factors were identified with a total percent accumulation of 65.405%. The Cronbach's alpha value for each factor was  $> 0.6$ , indicating acceptable reliability.

The first factor, hereafter referred to as the “quality of SVF and service” was identified from the responses to the service related to “SVF is good”, “providers of SVF are friendly”, “I do not think consuming SFV is a waste of time”, “I am satisfied with the providers of SVF”, “I am satisfied with the taste of SVF”, “I am satisfied with the purchase of SFV”, “I am satisfied with the overall service of SVF”, “the state of SVF service is satisfactory”, “the cost of SVF is appropriate”, and “utensils and facilities for consuming SVF are well prepared”. The second

factor, hereafter referred to as the “emotional response”, was identified from the responses to “SVF provides me pleasure”, “SVF makes me happy”, “SVF satisfies me”, and “consuming SVF is fun and comforting”. The third identified factor was linked to the responses to “I wish to introduce friends to SFV”, “I will still buy SVF even if the cost rises”, “I am willing to give a positive opinion of SVF”, “I will continue to consume SVF”, and “I am satisfied with SVF” and is referred to hereafter as “consumer loyalty”. The fourth factor was “SVF cleanliness” and was linked to the responses to “the environment in which SVF is sold is sanitary”, “utensils served with SVF are sanitary”, “SVF is sanitary”, and “SFV providers are sanitary”. The last factor was the “physical environment”, which was related to the responses to “the location of SVF stores is appropriate” and “stores selling SVF are easily accessible”.

#### Confirmatory factor analysis

A confirmatory factor analysis was conducted based on the results of the exploratory factor analysis. As a result of the confirmatory factor analysis, factor loading for the response to “I do not think consuming SVF is a waste of time” was  $< 0.5$ .

**Table 4.** Confirmatory analysis results

Factor		Factor loading	Error	Reliability	Average Variance Extracted
The quality of food and service quality of SVF <sup>1)</sup>	The services related to SVF are good.	0.561	0.439	0.910	0.570
	Providers of SVF are friendly.	0.665	0.395		
	I am satisfied with the providers of SVF.	0.738	0.255		
	I am satisfied with the taste of SVF.	0.747	0.297		
	I am satisfied with the purchase of SVF.	0.781	0.219		
	I am satisfied with the overall service of SVF.	0.729	0.265		
	The condition of SVF served is satisfactory.	0.714	0.296		
	The cost of SVF is adequate.	0.526	0.522		
	Utensils and facilities for consuming SVF are well prepared.	0.570	0.409		
Emotional response	SVF makes me happy.	0.933	0.110	0.856	0.605
	SVF provides me pleasure.	0.952	0.081		
	SVF satisfies me.	0.883	0.193		
	Consuming SVF in itself is fun and comforting.	0.601	0.524		
Sanitation of SVF	The environment in which SVF is sold is sanitary.	0.833	0.242	0.909	0.715
	Utensils served with SVF are sanitary.	0.786	0.304		
	SVF is sanitary.	0.789	0.250		
	Providers of SFV are sanitary.	0.799	0.231		
Physical environment	The location of SVF stores is appropriate.	0.789	0.287	0.825	0.702
	Stores selling SVF are easily accessible.	0.814	0.258		
Consumer loyalty	I would like to introduce SVF to friends.	0.773	0.370	0.866	0.567
	I will continue to consume SVF.	0.680	0.362		
	I am willing to speak positively of SVF.	0.748	0.400		
	I will still buy SVF even if the cost rises.	0.559	0.573		
	I am satisfied with SVF.	0.778	0.229		

$\chi^2 = 792,400$  ( $P = 0,000$ ),  $df = 242$ ,  $GFI = 0,830$ ,  $AGFI = 0,790$ ,  $NFI = 0,833$ ,  $CFI = 0,877$ ,  $RMR = 0,053$   
 SVF<sup>1)</sup>: street vended food

**Table 5.** Results of hypothesis testing

Path	Regression coefficient	Standard error	t	Result
The quality of food and service quality of SVF <sup>1)</sup> → Consumer loyalty	1.106	0.155	7.133	Support
Emotional response → Consumer loyalty	0.323	0.065	4.943	Support
Sanitation of SVF → Consumer loyalty	0.021	0.040	0.529	Rejection
Physical environment → Consumer loyalty	0.085	0.037	2.283	Support

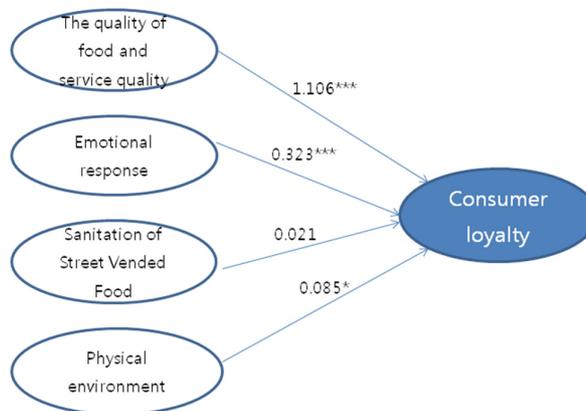
SVF<sup>1)</sup>: street vended food

Thus, another confirmatory factor analysis was performed after excluding that question. The results are presented in Table 4.

The goodness-of-fit-index was insufficient for the recommended level, but reliability ( $>0.7$ ) and average variance extracted ( $>0.5$ ) related to all factors was over the critical value [19]. This affirmed the reliability and convergent validity.

*Analysis of the structural equation model*

The results of the effects of the quality of SVF food and service, emotional response, SVF sanitation, and physical environment on consumer loyalty are presented in Fig. 1 and Table 5. The results of verifying model fidelity were  $\chi^2 = 685.989$ ,  $df = 261$ , Goodness of Fit Index,  $GFI = 0.851$ , Adjusted Goodness of Fit Index,  $AGFI = 0.814$ , Normed Fit Index,  $NFI = 0.901$ , Comparative Fit Index,  $CFI = 0.907$ , Root Mean square Residual,  $RMR =$



**Fig. 1.** Structural equation for the research model.  $\chi^2 = 685,989$ ,  $df = 261$ ,  $GFI = 0,851$ ,  $AGFI = 0,814$ ,  $NFI = 0,901$ ,  $CFI = 0,907$ ,  $RMR = 0,048$ ,  $*P < 0,05$ ,  $***P < 0,001$

0.048, indicating a satisfying structural model.

The effects that SVF food and service quality had on consumer loyalty (Table 5) had statistical significance with a regression coefficient of 1.106 and a t-value of 7.133. The effects that emotional response had on consumer loyalty were also statistically significant with a regression coefficient of 0.323 and a t-value of 4.943. These results are consistent with those of another study stating that consumer emotional response to Korean restaurants has positive impacts on consumer satisfaction (Jung and Yoon, 2010). The effects that SVF sanitation had on consumer loyalty were not statistically significant with a regression coefficient of 0.021 and t-value of 0.529. The satisfaction level of SVF sanitation was low, because the average score for four questions about sanitary of SVF was <3 (Table 2). However, it seemed that such a factor did not have a significant effect on consumer loyalty. Another study reported that Korean middle school, high school, and college students think that SVF sanitation is poor, yet they want SVF preserved [6]. The effects that physical environment had on consumer loyalty were statistically significant with a regression coefficient of 0.085 and a t-value of 2.283. Taken together, the quality of SVF food and service, the emotional response, and the physical environment had a statistically significant effect on consumer loyalty.

## Discussion

This study investigated the consumption, quality, point of service factors, and consumer satisfaction of SVF by high school students who have easy access to SVF; thus, helping to improve SVF quality and increase consumer satisfaction.

Of the 310 students that answered the questionnaire, 28.7% were men and 71.3% were women. In total, 30.6% received allowances of 20,000-40,000; 26.3% received 40,000-60,000, 22.8% received < 20,000, and 20.3% received > 60,000. Those who purchased SVF one to two times per week were the largest group followed by those who did not purchase SVF at all. The most popular SVFs were Ddukbokki, Sundae, and Uhmok. The purchaser was usually accompanied by a friend, and the most common store location was on the pavement or sidewalk of a larger street. The largest group indicated no particular preference for SVF, whereas the next largest group indicated that they liked SVF. The reasons for liking SVF were because it is readily accessible followed by because it substitutes as a meal, and because it is low cost. The most popular reason for not liking SVF was due to its unclean reputation. Overall, the scores for "SVF is sanitary", "the environment in which SVF is sold is sanitary", "utensils served with SVF are sanitary" and "SFV providers are sanitary" were low. In particular, the scores given by women for the cleanliness of the SVF store environment and utensils were lower than those given by men ( $P < 0.05$ ). Reliability and investigative factor analyses identified five primary factors, including quality of SVF and service, emotional response,

consumer loyalty, SVF cleanliness, and the physical environment, and each factor had a Cronbach's alpha value  $\geq 0.6$ . Analysis of the structural equation model demonstrated that the SVF food and service quality, emotional response, and physical environment had statistically significant impacts on consumer loyalty. In contrast, SVF sanitation did not have a statistically significant effect on consumer loyalty.

Based on these results, SVF sanitary management needs to be addressed immediately combined with education of the SVF providers on sanitary handling of SVF and maintaining a clean environment. Nutrition education should be performed in high school by a certified nutritionist.

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