

# Convenience store visitors recall cigarette advertisements even if they do not purchase cigarettes

Ji-eun Hwang<sup>1</sup>, Sung-il Cho<sup>1,2</sup>, Yu-seon Yang<sup>3</sup>, Jung-eun Lee<sup>3</sup>, Seon-young Lee<sup>4</sup>, Yu-mi Oh<sup>3</sup>

<sup>1</sup>Department of Public Health Science, Graduate School of Public Health, Seoul National University, Seoul 08826, Republic of Korea

<sup>2</sup>Institute of Health and Environment, Seoul National University, Seoul 08826, Republic of Korea

<sup>3</sup>Korea Health Promotion Institute, Seoul 04551, Republic of Korea

<sup>4</sup>Gyeonggi Infectious Disease Control Center, Gyeonggi-do 13605, Republic of Korea

Address correspondence to Yumi Oh, E-mail: yumioh@gmail.com

## ABSTRACT

**Background** This study examined the extent to which visitors to convenience stores remember the cigarette advertisements they encounter in these stores and investigated the relationships between how advertisements are recalled and attitudes toward them.

**Methods** Exit surveys of 1007 visitors to three convenience stores located in Seoul, Korea, were conducted between 25 November 2015 and 7 December 2015.

**Results** Of the respondents, 23.4% ( $n = 236$ ) freely recalled the cigarette advertisement in the store just visited. However, the percentage of participants who correctly recalled the advertisement increased to 55.2% ( $n = 556$ ) after we presented them with a card showing options for the advertisement (i.e. a cued recall task). Regardless of sex or purchasing cigarettes, free recall performance was significantly associated with age, number of weekly visits to the convenience store and current smoking status. In addition, free recall increased with having a positive attitude toward cigarette advertisements.

**Conclusions** Repeated visits to convenience stores may continue to expose individuals to cigarettes and their advertisements; such exposure may subconsciously affect recall of the advertisements and maintenance of a positive attitude toward cigarette advertisements. Therefore, to denormalize smoking in society, cigarette advertising and displays at points of sale including convenience stores, should be banned.

**Keywords** behavior, health promotion, smoking

## Introduction

Tobacco advertising is a major marketing activity that tobacco companies use to increase consumption of tobacco.<sup>1</sup> With strengthened regulations for tobacco control, the types of cigarette advertisements have been limited.<sup>2</sup> To promote the sale of tobacco products, tobacco companies pay enormous amounts to display tobacco products and install cigarette advertisements at the point of sale (POS).<sup>3</sup>

Cigarette advertising and display at POS contribute to making cigarettes a popular product,<sup>4</sup> and adversely affect the creation of a smoke-free environment<sup>5</sup> because they can undermine attempts to quit and create an impulse to buy cigarettes in smokers, as well as causing ever smokers to restart smoking and affecting smoking susceptibility and smoking initiation in adolescents.<sup>6,7</sup> Therefore, the Framework Convention on Tobacco

Control (FCTC) requires that all types of tobacco advertising and promotional activities, including displays at POS, be banned within 5 years of the entry into force of the Convention.<sup>8</sup>

To enhance implementation of the Convention and to reduce socio-economic losses due to smoking, the Korean government announced comprehensive tobacco-control measures that included a plan to enact a comprehensive ban on tobacco advertising, promotion and sponsorship.<sup>9</sup> The measures involved a

Ji-eun Hwang, Graduate Student

Sung-il Cho, Professor

Yu-seon Yang, Senior Researcher

Jung-eun Lee, Senior Researcher

Seon-young Lee, Researcher

Yu-mi Oh, Director

plan for the gradual expansion of a ban on the advertisement and display of cigarettes at POS. Nevertheless, cigarettes were still displayed and various cigarette advertisements were evident in a survey of 2856 stores near schools in 2016.<sup>10</sup>

In addition, convenience stores (20.8 advertisements) had a higher average number of interior cigarette advertisements than supermarkets (8.0 advertisements) and small cigarette retailers (3.5 advertisements).<sup>10</sup> Convenience stores, which have maintained a rapid, sustained growth rate since their entry into the market, now play an important role in retail distribution in Korea.<sup>11</sup> As such, the market growth of convenience stores is related to tobacco advertising in these stores.<sup>12</sup> Indeed, the tobacco industry is forced to concentrate on displays and advertisements placed at POS because these are the main ways to communicate with current and future customers,<sup>13</sup> given that mass media tobacco advertising is banned in Korea.<sup>14</sup> Because the Korea convenience store market is expected to grow gradually, especially as the consumption pattern has changed to local shopping and hand-to-mouth buying due to the increased number of one-person households and an aging population,<sup>11</sup> exposure to cigarette advertisements and displays could increase, increasing the problem.

To communicate brand image, tobacco companies use the principle of repetition, including consistency and relevance,<sup>15</sup> because consumers' choices and purchasing are influenced unconsciously by processed messages, as well as by conscious recognition.<sup>16,17</sup> Indeed, repetitive exposure increases positive emotional reactions, preference, favor and familiarity with a product that is remembered unconsciously, and is related to the likelihood of purchasing and using a product.<sup>18</sup> However, previous research focused on the impact of tobacco promotion at POS among children, youths and young adults.<sup>19</sup> Although cigarette displays at POS affect brand recall related to smoking uptake, few studies have examined recall of cigarette advertisements at POS, especially in a real situation immediately following exit from the store.<sup>20</sup>

It is necessary to examine how many people are exposed to cigarette advertisements and displays and how much of this advertising they recall. Moreover, there is a need to explore the factors that affect their recall. Therefore, in this study, we examined the extent to which visitors to convenience stores remembered the cigarette advertisements that they encountered in these stores, and investigated the relationship between advertisement recall and attitudes toward the advertisements.

## Methods

### Survey days and locations

We conducted an exit survey of visitors to three convenience stores located in Seoul, Korea, for 12 days. To examine

participants with various demographic characteristics, the locations of the convenience stores were varied. Three stores were selected in a downtown area: one in a commercial area, one in a school zone and one in a residential area. Each convenience store sold and displayed cigarettes and had installed cigarette advertisements, under similar advertising conditions.

### Procedures

As our survey was aimed at people who visit convenience stores, people exiting convenience stores were asked by a trained interviewer to participate in the survey. We used a tablet computer to record the data collected during the interviews with consenting participants. Each participant was given a disposable hand warmer as a token of our gratitude for completing the survey.

### Participants

The survey participants were selected randomly at the survey locations, and non-proportional allocation sampling was used to select the target groups:<sup>21</sup> adult smokers, adult non-smokers and adolescents. Participants over the age of 19 years were defined as adults, while those between 12 and 18 years were defined as adolescents. Current or occasional smokers were defined as smokers and those who had smoked in the past but no longer smoked or had never smoked were defined as non-smokers. Ultimately, we asked 1200 respondents to participate in the survey. After excluding invalid responses, we analyzed data from 1007 respondents.

### Measurements

The questionnaire consisted of three sections: demographic characteristics, advertising recall and attitude toward cigarette advertisements in convenience stores. The questions on demographics included the participant's sex, birth year, current occupation, current smoking status, average number of visits to the convenience store per week and products purchased. In addition, smokers were asked questions about the average number of cigarettes smoked per day, frequency of cigarette purchases per week, past experience with attempting to quit, intention to quit and type of cigarettes purchased.

To compare the accuracy of recall, we assessed the two types of advertising recall, namely free recall and cued recall, with different questions. The free recall measures, which we adapted from those used in previous alcohol and tobacco marketing studies,<sup>22,23</sup> were more objective than the perceived exposure measure. Successful free recall means that the stored information has been correctly retrieved. In the cued recall evaluation, we confirmed whether the information was stored for information processing purposes by showing the respondents images from

the convenience store they had just visited and asking them if they recognized the advertisements. We asked the participants two advertising recall questions developed by Carter *et al.*<sup>23</sup> The following free recall question was asked first: 'What cigarette ads, if any, did you see in the convenience store?' We considered the free recall task to have been completed successfully if the participant mentioned anything related to the cigarette advertisements or displays inside the store. Next, in preparation for the cued recall question, a view card was made for each convenience store. The participant was shown the card and asked, 'Which advertisement on this card do you remember?' If the participant selected any advertisement or display from the card, the cued recall was considered successful.

Finally, five questions were used to assess the participant's attitude toward cigarette advertisements in convenience stores: 'I usually pay close attention to the cigarette advertisements in the convenience store (Attention); I usually get information about new products from cigarette advertisements (Information); When I see cigarette advertisements, I usually become curious about the product (Curious); When I see cigarette advertisements, I usually have an urge to smoke (Smoking); and When I see cigarette advertisements, I usually get the urge to purchase the product (Purchase)'. The response options were coded using a 5-point Likert scale ranging from strongly disagree to strongly agree. For the data analysis, responses one through three were classified as the disagree group, and four and five were identified as the agree group.

### Data analysis

All statistical analyses were performed using IBM SPSS ver. 24.0. Descriptive statistics were generated to summarize the participants' characteristics, recall of advertising (free recall and cued recall) in the convenience store just visited, and attitude toward cigarette advertisements in the convenience store. After adjusting for store location, we performed a logistic regression analysis to elucidate the relationship between participants' demographic characteristics and their performance on both types of advertising recall task. To examine factors affecting their attitude, multiple logistic regression analysis was used to calculate the adjusted odds ratio (aOR) and 95% confidence interval (CI) adjusting for all other variables and store location in the model. In this study, *P*-values <0.05 were considered significant.

## Results

### Participants

Table 1 presents the participants' characteristics: 612 males (60.8%) and 395 (39.2%) females participated in this survey,

including 298 adolescents (29.6%) and 709 adults (70.4%). The mean age of the participants was 31.4 (standard deviation [SD] = 13.7) years, and 28.7% (*n* = 289) of the participants were white-collar workers.

The average number of visits to the convenience store per week was 3.8 (SD = 1.4) times for all participants. The average number of weekly visits to the convenience store was 5–7 times for 31.8% (*n* = 320), 4 times for 21.0% (*n* = 211), 3 times for 30.2% (*n* = 304) and 1–2 times for 17.0% (*n* = 172). Moreover, 29.7% (*n* = 299) of the participants purchased cigarettes during their visit to the convenience store.

Of the participants, 35.5% (*n* = 357) were smokers and 64.5% (*n* = 650) were non-smokers. The smokers smoked an average of 14.8 (SD = 5.2) cigarettes per day, and the average number of visits to the convenience store was 4.6 (SD = 1.3) per week. Most smokers (97.5%, *n* = 348) decided to buy a specific cigarette brand in advance and visited a tobacco retailer. In addition, most smokers tended to buy only one brand of cigarettes (91.9%, *n* = 328), although 8.1% (*n* = 29) of smokers often bought other brands. Of the smokers, 40.9% (*n* = 146) had attempted to quit smoking, 48.2% (*n* = 172) planned to quit smoking and 51.8% (*n* = 185) had no plan to quit at present.

### Advertising recall for the convenience store just visited

The advertisements or displays in the store that participants had just visited were recalled by 23.4% (*n* = 236) of respondents in the free recall task and by 55.2% (*n* = 556) of respondents in the cued recall task. Participants' advertising recall increased by 73.8% when we showed them options on a card. This increase was particularly noticeable among adolescents, students and non-smokers.

Table 2 shows the multiple logistic regression results after adjusting for store location. In the case of free recall, when compared with participants aged  $\geq 50$  years, the adjusted odds of recall of cigarette advertisements or displays in the convenience store just visited was significantly higher among participants aged 19–29 years (aOR = 2.8, 95% CI: 1.4–5.4), 30–39 years (aOR = 2.5, 95% CI: 1.3–4.8), and 40–49 years (aOR = 2.5, 95% CI: 1.3–4.6). In addition, smokers were 3.0 times (95% CI = 1.6–5.8) more likely to recall advertising than non-smokers.

The frequency of visiting the convenience store was also related to the recall of cigarette advertisements or displays, and those who visited 5–7 times a week were more likely to recall the advertisements than were those who visited 1–2 times per week (aOR = 2.0, 95% CI: 1.0–3.7). There were

**Table 1** Summary of the key characteristics of study participants (*n* = 1007)

| Characteristic  | n   | (%)    |
|---|-----|--------|
| Sex   |     |        |
| Male  | 612 | (60.8) |
| Female  | 395 | (39.2) |
| Age (years)   |     |        |
| 12–18   | 298 | (29.6) |
| 19–29   | 225 | (22.3) |
| 30–39   | 197 | (19.6) |
| 40–49   | 157 | (15.6) |
| ≥50   | 130 | (12.9) |
| Occupation  |     |        |
| Student   | 348 | (34.6) |
| White collar  | 289 | (28.7) |
| Blue collar   | 201 | (20.0) |
| Other   | 169 | (16.8) |
| Convenience store visits per week   |     |        |
| 5–7   | 320 | (31.8) |
| 4   | 211 | (21.0) |
| 3   | 304 | (30.2) |
| 1–2   | 172 | (17.0) |
| Cigarettes purchased  |     |        |
| Yes   | 299 | (29.7) |
| No  | 708 | (70.3) |
| Smoking status  |     |        |
| Smoker  | 357 | (35.5) |
| Non-smoker  | 650 | (64.5) |
| Quitting attempted <sup>a</sup>   |     |        |
| Yes   | 146 | (40.9) |
| No  | 211 | (59.1) |
| Intention to quit <sup>a</sup>  |     |        |
| Within 1 month  | 9   | (2.5)  |
| Within 6 months   | 30  | (8.4)  |
| Thinking about quitting, but not within 6 months                          | 133 | (37.3) |
| No interest in quitting   | 185 | (51.8) |
| Type of cigarette purchase <sup>a</sup>                                   |     |        |
| Planned   | 348 | (97.5) |
| Unplanned   | 9   | (2.5)  |
| Purchased an alternative brand rather than their usual brand <sup>a</sup> |     |        |
| Yes   | 29  | (8.1)  |
| No  | 328 | (91.9) |

<sup>a</sup>Data for the subset of 357 smoker participants.

no significant associations between free recall and occupation or cigarette purchase or sex.

However, significantly, the cued recall performance was associated only with current smoking status; smokers were 2.5 times (95% CI = 1.3–4.7) more likely to recall advertising than were non-smokers.

**Attitude toward cigarette advertisements**

Of the participants, 4.4% (*n* = 44) agreed that they usually paid close attention to the cigarette advertisements in the convenience store (Table 3). In addition, 7.5% (*n* = 76) of the participants usually tended to obtain information about new products from the cigarette advertisements in the convenience store. When they saw cigarette advertisements, 7.3% (*n* = 74) of the participants reported developing some degree of curiosity about the product advertised, 8.1% (*n* = 82) reported getting an urge to smoke, and 8.1% (*n* = 82) reported an urge to purchase the product advertised.

Next, Table 4 shows the results from the multiple logistic regression between the participants’ characteristics and their attitudes toward cigarette advertisements in convenience stores, after adjusting for store location. The frequency with which participants visited convenience stores was related to the level of attention that they paid to the cigarette advertisements inside; those who visited 5–7 times a week (aOR = 9.5, 95% CI: 1.2–76.2) or 4 times a week (aOR = 8.9, 95% CI: 1.1–72.3) were more likely to pay attention to the advertisements than were those who visited 1–2 times per week.

The adjusted odds ratio for attention in the group that completed the free recall task successfully (aOR = 6.4, 95% CI: 2.6–15.7) was significantly higher than that in the group who failed the free recall trial. In addition, respondents who were successful at the free recall task were significantly more likely than did those who were not to agree that they usually recalled information from cigarette advertisements (aOR = 4.5, 95% CI: 2.4–8.4), that they usually became curious about the products advertised (aOR = 4.7, 95% CI: 2.4–9.0), that they usually felt the urge to smoke (aOR = 3.8, 95% CI: 2.1–7.0), and that they usually felt the urge to purchase the product advertised (aOR = 4.6, 95% CI: 2.5–8.6).

Likewise, those who completed the cued recall task successfully were significantly more likely than were those who failed the cued recall task to express positive attitudes toward cigarette advertisements (Information: aOR = 4.6, 95% CI: 1.8–11.5; Curious: aOR = 2.9, 95% CI: 1.1–7.4; Smoking: aOR = 2.3, 95% CI: 1.0–5.3; Purchase: aOR = 3.5, 95% CI: 1.3–9.1). In addition, smokers were significantly more likely than non-smokers to report a positive attitude toward cigarette advertisements (Information: aOR = 3.1, 95% CI: 1.1–8.5; Curious: aOR = 5.3, 95% CI: 1.9–15.0; Smoking: aOR = 4.7, 95% CI: 1.8–12.0; Purchase: aOR = 5.0, 95% CI: 1.9–13.5).

**Discussion**

**Main finding of this study**

The purpose of this study was to assess exposure to cigarette advertisements and displays in convenience stores and

**Table 2** Descriptive and multiple logistic regression analyses showing the adjusted odds ratio (aOR) and 95% confidence interval (95% CI) for risk factors associated with free recall and cued recall of cigarette advertisements or displays in the convenience store just visited

|                                   | Free recall success (n = 236) |        |                  |                  | Cued recall success (n = 556) |        |                  |                  |
|-----------------------------------|-------------------------------|--------|------------------|------------------|-------------------------------|--------|------------------|------------------|
|                                   | n                             | (%)    | aOR <sup>a</sup> | (95% CI)         | n                             | (%)    | aOR <sup>a</sup> | (95% CI)         |
| Sex                               |                               |        |                  |                  |                               |        |                  |                  |
| Male                              | 161                           | (68.2) | 1.1              | (0.8–1.7)        | 365                           | (65.6) | 1.4              | (1.0–1.9)        |
| Female                            | 75                            | (31.8) | 1.0              | Ref.             | 191                           | (34.4) | 1.0              | Ref.             |
| Age (years)                       |                               |        |                  |                  |                               |        |                  |                  |
| 12–18                             | 25                            | (10.6) | 1.1              | (0.4–2.8)        | 133                           | (23.9) | 1.4              | (0.6–3.0)        |
| 19–29                             | 75                            | (31.8) | <b>2.8</b>       | <b>(1.4–5.4)</b> | 139                           | (25.0) | 1.6              | (0.9–2.8)        |
| 30–39                             | 60                            | (25.4) | <b>2.5</b>       | <b>(1.3–4.8)</b> | 118                           | (21.2) | 1.5              | (0.9–2.5)        |
| 40–49                             | 52                            | (22.0) | <b>2.5</b>       | <b>(1.3–4.6)</b> | 93                            | (16.7) | 1.1              | (0.7–1.9)        |
| ≥50                               | 24                            | (10.2) | 1.0              | Ref.             | 73                            | (13.1) | 1.0              | Ref.             |
| Occupation                        |                               |        |                  |                  |                               |        |                  |                  |
| Student                           | 40                            | (16.9) | 0.9              | (0.4–1.9)        | 160                           | (28.8) | 0.7              | (0.4–1.5)        |
| White collar                      | 86                            | (36.4) | 0.9              | (0.5–1.5)        | 173                           | (31.1) | 1.0              | (0.6–1.6)        |
| Blue collar                       | 68                            | (28.8) | 1.3              | (0.7–2.2)        | 123                           | (22.1) | 1.2              | (0.7–2.0)        |
| Other                             | 42                            | (17.8) | 1.0              | Ref.             | 100                           | (18.0) | 1.0              | Ref.             |
| Convenience store visits per week |                               |        |                  |                  |                               |        |                  |                  |
| 5–7                               | 111                           | (47.0) | <b>2.0</b>       | <b>(1.0–3.7)</b> | 204                           | (36.7) | 1.1              | (0.7–1.8)        |
| 4                                 | 49                            | (20.8) | 1.8              | (0.9–3.4)        | 121                           | (21.8) | 1.0              | (0.7–1.6)        |
| 3                                 | 59                            | (25.0) | 1.7              | (0.9–3.2)        | 155                           | (27.9) | 1.1              | (0.7–1.7)        |
| 1–2                               | 17                            | (7.2)  | 1.0              | Ref.             | 76                            | (13.7) | 1.0              | Ref.             |
| Cigarettes purchased              |                               |        |                  |                  |                               |        |                  |                  |
| Yes                               | 130                           | (55.1) | 1.1              | (0.6–1.9)        | 211                           | (37.9) | 0.9              | (0.5–1.6)        |
| No                                | 106                           | (44.9) | 1.0              | Ref.             | 345                           | (62.1) | 1.0              | Ref.             |
| Smoking status                    |                               |        |                  |                  |                               |        |                  |                  |
| Smoker                            | 153                           | (64.8) | <b>3.0</b>       | <b>(1.6–5.8)</b> | 252                           | (45.3) | <b>2.5</b>       | <b>(1.3–4.7)</b> |
| Non-smoker                        | 83                            | (35.2) | 1.0              | Ref.             | 304                           | (54.7) | 1.0              | Ref.             |

aOR, adjusted odds ratio; CI, confidence interval; Ref, reference. The values in bold are statistically significant ( $P < 0.05$ ).

<sup>a</sup>Including all control variables, regardless of significance of contribution to the model, and adjusted for store location.

to evaluate the effects of this exposure. To this end, this study investigated recall of cigarette advertisements, including displays, in convenience stores just visited and the factors that affected recall. To minimize bias in advertising recall tasks, we administered our survey as consumers were exiting a store and assessed the two types of advertising recall, free recall and cued recall, using different questions. In total, 23.4% ( $n = 236$ ) and 55.2% ( $n = 556$ ) of the participants successfully completed the free and cued recall tasks, respectively. Cued recall was about twice as successful as free recall; this difference was particularly noticeable among adolescents, students and non-smokers.

The free recall performance of participants in their 20s was stronger than that of participants aged 50 and over, in smokers than in non-smokers, and in those who visited convenience stores 5–7 times per week than in those who visited 1–2 times a week. The cued recall success of participants who

identified themselves as smokers was higher than that of non-smokers. Moreover, although most people do not usually pay attention to cigarette advertisements in convenience stores, those who succeeded in recalling cigarette advertisements were likely to have a positive attitude toward them.

### What is already known on this topic

Exposure to tobacco advertising and displays at POS influences the smoking behavior of smokers. Indeed, such exposure enables smokers to continue to smoke and is associated with impulsive cigarette purchase.<sup>24,25</sup> It also makes it more difficult for smokers to quit smoking.<sup>5</sup> As a result, the ban on tobacco advertising and display affects the decline in the prevalence of smoking. Yanyn *et al.*<sup>26</sup> presented results implying that imposing a POS display ban reduced the overall adult daily smoking rate, male smoking rate and female smoking rate by ~7, 6 and 9%, respectively. In addition, the

**Table 3** Descriptive analysis for attitudes toward cigarette advertisements ( $n = 1007$ )

|   | n   | (%)    |
|---|-----|--------|
| I usually pay close attention to the cigarette advertisements in convenience stores |     |        |
| Agree   | 44  | (4.4)  |
| Disagree  | 963 | (95.6) |
| I usually obtain information about new products from cigarette advertisements       |     |        |
| Agree   | 76  | (7.5)  |
| Disagree  | 931 | (92.5) |
| When I see cigarette advertisements, I usually become curious about the products    |     |        |
| Agree   | 74  | (7.3)  |
| Disagree  | 933 | (92.7) |
| When I see cigarette advertisements, I usually feel an urge to smoke                |     |        |
| Agree   | 82  | (8.1)  |
| Disagree  | 925 | (91.9) |
| When I see cigarette advertisements, I usually feel an urge to purchase the product |     |        |
| Agree   | 82  | (8.1)  |
| Disagree  | 925 | (91.9) |

removal of POS tobacco advertising and displays is a popular measure that is supported by the majority of adults. Adults from countries where these measures have been adopted agree that the ban has made it easier for people to quit smoking.<sup>27</sup>

Although the teenage participants did not report that this type of exposure significantly influenced their behavior or attitudes, POS tobacco advertisements distort adolescents' perceptions of the availability, use, and popularity of tobacco products,<sup>28</sup> and are associated with positive attitudes toward smoking.<sup>29</sup> This renders adolescents much more vulnerable to starting smoking.<sup>30–33</sup> Indeed, repeated exposure to cigarette advertisements by visiting convenience stores may increase the likelihood of smoking and the possibility of adolescents' becoming smokers in adulthood.<sup>34,35</sup> Since advertising can distort young people's emotions and the processes that lead them to accept information,<sup>36</sup> it is necessary to protect vulnerable young people from cigarette advertisements.

### What this study adds

The results of the free recall and cued recall experiments require different interpretations. The free recall performance indicates whether participants could verbalize their memories of cigarette advertisements, whereas their cued recall performance confirms that they remembered an advertisement, either verbally or non-verbally.<sup>22,23</sup> Thus, free recall is the clearest indication that stored information has been successfully recalled after it has been processed. This is noteworthy because it does not simply mirror the way that free recall tasks differ from cued recall tasks.

Notably, Korean smokers were better at free recall than Australian smokers (42.9 versus 20.0%),<sup>23</sup> which demonstrates the significance of the effects of the high levels of exposure to cigarette advertisements and displays in Korean convenience stores. That is because Australia has gradually implemented a ban on the display of tobacco at POS.<sup>26</sup>

Additionally, participants were easily able to recall, with only minimal cues, whether there were cigarette advertisements and/or displays in a store and, if so, to report on their contents. Although we may have overestimated the cued recall performance because our option card may have led participants to a particular response, our results imply that Koreans are exposed to cigarette advertising without even realizing that this is the case. They apparently store the contents of these advertisements unconsciously, as only 4.4% ( $n = 44$ ) of the 1007 survey participants said that they usually paid attention to cigarette advertisements, but 23.4% ( $n = 236$ ) and 55.2% ( $n = 556$ ) successfully completed the free and cued recall tasks, respectively.

In purchasing decisions, consumers have different feelings and thoughts depending on what product they are considering. Consumer involvement is determined according to the level of personal interest.<sup>37</sup> Generally, cigarette products are considered as ranking low in terms of the level of personal involvement and feelings.<sup>37</sup> Indeed, cigarettes are low in price and are not immediately dangerous, even if consumers are mistaken to purchase them. This means that consumers often make relatively quick decisions when purchasing them and consider the satisfaction of their personal tastes as highly important.<sup>37</sup>

**Table 4** Multiple logistic regression analyses showing the adjusted odds ratio (aOR) and 95% confidence interval (95% CI) for the attitudes toward cigarette advertisements with respect to the participants' individual characteristics and advertising recall performance (free recall and cued recall) in the convenience store just visited

|                                   | <i>Attention</i> |                   | <i>Information</i> |                   | <i>Curious</i>   |                   | <i>Smoking</i>   |                   | <i>Purchase</i>  |                   |
|-----------------------------------|------------------|-------------------|--------------------|-------------------|------------------|-------------------|------------------|-------------------|------------------|-------------------|
|                                   | aOR <sup>a</sup> | (95% CI)          | aOR <sup>a</sup>   | (95% CI)          | aOR <sup>a</sup> | (95% CI)          | aOR <sup>a</sup> | (95% CI)          | aOR <sup>a</sup> | (95% CI)          |
| Sex                               |                  |                   |                    |                   |                  |                   |                  |                   |                  |                   |
| Male                              | 0.8              | (0.4–1.6)         | 0.9                | (0.5–1.8)         | 0.9              | (0.5–1.7)         | 1.6              | (0.8–3.1)         | 1.2              | (0.6–2.3)         |
| Female                            | 1.0              | Ref.              | 1.0                | Ref.              | 1.0              | Ref.              | 1.0              | Ref.              | 1.0              | Ref.              |
| Age (years)                       |                  |                   |                    |                   |                  |                   |                  |                   |                  |                   |
| 12–18                             | 0.7              | (0.1–3.6)         | 0.5                | (0.1–2.3)         | 0.9              | (0.2–4.7)         | 0.8              | (0.2–3.7)         | 1.5              | (0.3–7.2)         |
| 19–29                             | 1.0              | (0.3–3.3)         | 0.7                | (0.2–2.0)         | 1.5              | (0.5–4.5)         | 0.7              | (0.2–2.1)         | 1.4              | (0.5–4.2)         |
| 30–39                             | 0.7              | (0.2–2.4)         | 1.5                | (0.6–4.0)         | 2.1              | (0.7–6.4)         | 2.2              | (0.8–5.8)         | 2.6              | (0.9–7.5)         |
| 40–49                             | 0.7              | (0.2–2.3)         | 1.1                | (0.4–2.9)         | 1.9              | (0.7–5.5)         | 1.7              | (0.7–4.4)         | 2.5              | (0.9–6.9)         |
| ≥50                               | 1.0              | Ref.              | 1.0                | Ref.              | 1.0              | Ref.              | 1.0              | Ref.              | 1.0              | Ref.              |
| Occupation                        |                  |                   |                    |                   |                  |                   |                  |                   |                  |                   |
| Student                           | 0.8              | (0.2–3.3)         | 2.0                | (0.6–6.9)         | 1.9              | (0.6–6.1)         | 1.1              | (0.3–3.7)         | 0.9              | (0.3–2.8)         |
| White collar                      | 0.5              | (0.2–1.4)         | 1.1                | (0.5–2.7)         | 0.8              | (0.3–1.8)         | 0.7              | (0.3–1.6)         | 0.7              | (0.3–1.6)         |
| Blue collar                       | 0.9              | (0.3–2.5)         | 0.9                | (0.4–2.2)         | 0.5              | (0.2–1.4)         | 0.3              | (0.1–0.8)         | 0.4              | (0.2–1.0)         |
| Other                             | 1.0              | Ref.              | 1.0                | Ref.              | 1.0              | Ref.              | 1.0              | Ref.              | 1.0              | Ref.              |
| Convenience store visits per week |                  |                   |                    |                   |                  |                   |                  |                   |                  |                   |
| 5–7                               | <b>9.5</b>       | <b>(1.2–76.2)</b> | 0.9                | (0.3–2.4)         | 2.6              | (0.7–9.6)         | 4.5              | (1.0–20.9)        | 4.0              | (0.9–18.2)        |
| 4                                 | <b>8.9</b>       | <b>(1.1–72.3)</b> | 0.6                | (0.2–1.8)         | 0.7              | (0.2–3.2)         | 1.8              | (0.4–9.0)         | 2.8              | (0.6–13.4)        |
| 3                                 | 4.2              | (0.5–34.8)        | 0.4                | (0.2–1.3)         | 1.4              | (0.4–5.2)         | 3.4              | (0.7–15.6)        | 1.3              | (0.3–6.5)         |
| 1–2                               | 1.0              | Ref.              | 1.0                | Ref.              | 1.0              | Ref.              | 1.0              | Ref.              | 1.0              | Ref.              |
| Cigarettes purchased              |                  |                   |                    |                   |                  |                   |                  |                   |                  |                   |
| Yes                               | 0.4              | (0.1–1.0)         | 1.4                | (0.6–3.2)         | 0.8              | (0.4–1.7)         | 0.5              | (0.2–1.1)         | 0.8              | (0.3–1.7)         |
| No                                | 1.0              | Ref.              | 1.0                | Ref.              | 1.0              | Ref.              | 1.0              | Ref.              | 1.0              | Ref.              |
| Smoking status                    |                  |                   |                    |                   |                  |                   |                  |                   |                  |                   |
| Smoker                            | 2.8              | (1.0–8.2)         | <b>3.1</b>         | <b>(1.1–8.5)</b>  | <b>5.3</b>       | <b>(1.9–15.0)</b> | <b>4.7</b>       | <b>(1.8–12.0)</b> | <b>5.0</b>       | <b>(1.9–13.5)</b> |
| Non-smoker                        | 1.0              | Ref.              | 1.0                | Ref.              | 1.0              | Ref.              | 1.0              | Ref.              | 1.0              | Ref.              |
| Recall                            |                  |                   |                    |                   |                  |                   |                  |                   |                  |                   |
| Free recall                       |                  |                   |                    |                   |                  |                   |                  |                   |                  |                   |
| Success                           | <b>6.4</b>       | <b>(2.6–15.7)</b> | <b>4.5</b>         | <b>(2.4–8.4)</b>  | <b>4.7</b>       | <b>(2.4–9.0)</b>  | <b>3.8</b>       | <b>(2.1–7.0)</b>  | <b>4.6</b>       | <b>(2.5–8.6)</b>  |
| Failure                           | 1.0              | Ref.              | 1.0                | Ref.              | 1.0              | Ref.              | 1.0              | Ref.              | 1.0              | Ref.              |
| Cued recall                       |                  |                   |                    |                   |                  |                   |                  |                   |                  |                   |
| Success                           | 0.7              | (0.3–1.8)         | <b>4.6</b>         | <b>(1.8–11.5)</b> | <b>2.9</b>       | <b>(1.1–7.4)</b>  | <b>2.3</b>       | <b>(1.0–5.3)</b>  | <b>3.5</b>       | <b>(1.3–9.1)</b>  |
| Failure                           | 1.0              | Ref.              | 1.0                | Ref.              | 1.0              | Ref.              | 1.0              | Ref.              | 1.0              | Ref.              |

Attention: endorsement meant that participants usually paid close attention to cigarette advertisements in convenience stores.

Information: endorsement meant that participants usually obtained information about new products from cigarette advertisements.

Curious: endorsement meant that participants usually felt curious about cigarettes when they saw them advertised.

Smoking: endorsement meant that participants usually felt an urge to smoke when they saw cigarette advertisements.

Purchase: endorsement meant that participants usually felt an urge to purchase cigarettes when they saw them advertised.

aOR, adjusted odds ratio; CI, confidence interval; Ref, reference. The values in bold are statistically significant ( $P < 0.05$ ).

<sup>a</sup>Including all control variables (e.g. sex, age, occupation, weekly frequency of visiting the convenience store, cigarettes purchase, smoking status and advertising recall (free recall and cued recall)) regardless of the significance of their contribution to the model and adjusted for store location.

In other words, consumers behave passively in response to information about low-involvement products,<sup>37</sup> so companies develop advertising that consumers can easily remember,

rather than strategies based on large volumes of content.<sup>38</sup> As a result, strategies based on mere exposure to advertisements have been applied in the case of low-involvement products

such as cigarettes. These strategies aim to make consumers feel more familiar with the brand. Furthermore, they may even unconsciously encourage consumers to purchase a product.<sup>38,39</sup>

We found that people recalled tobacco advertisements easily, despite not usually paying close attention to tobacco advertising. These results imply that many people store information about cigarette advertisements unconsciously due to repeated exposure to tobacco advertising and displays. In particular, we should highlight the results showing that 10.6% of adolescents completed the free recall task successfully, and 23.9% succeeded in the cued recall task, indicating that repeated exposure to cigarette advertisements may affect their future purchasing behavior. Therefore, the installation of POS cigarette advertisements and displays of tobacco products should be prohibited to protect adolescents from indiscriminate exposure to tobacco advertisements and thereby to prevent smoking.

Additionally, the more frequently the convenience stores were visited, the greater was the probability of successful free recall. Thus, repeatedly exposing people to cigarette advertisements or displays maintains their positive attitudes toward cigarette advertisements<sup>18</sup> and attracts the attention of vulnerable people who are susceptible to advertisements.<sup>40</sup> In particular, although most people disagreed with our results on the influence of cigarette advertising, recall was found to be associated with a positive attitude toward cigarette advertisements.

Conflicts between people's beliefs and behaviors cause cognitive dissonance,<sup>41</sup> which in turn affects consumer's post-purchase attitudes. After purchasing a particular product, people tend to change their beliefs or behaviors to address any cognitive dissonance they may be experiencing, even if they do not usually pay attention to or express any interest in such products.<sup>41,42</sup> As a result, repeated exposure to tobacco advertising can lead to cognitive dissonance about tobacco products. This implies that the likelihood that both smokers and non-smokers will make impulse tobacco purchases will increase in the future. Furthermore, product preferences may become more positive or the likelihood of buying may increase to reduce the cognitive dissonance.<sup>42</sup>

As they increase in popularity, convenience stores are becoming more and more integrated into daily life,<sup>11</sup> with most participants visiting their local convenience store more than three times per week. Exposure to tobacco advertising has become common and will continue to increase in the future. We will be exposed to environments where we can buy cigarettes at any time. Therefore, to create smoke-free environments, we must prohibit tobacco advertising across all mass media formats, including TV.

### Limitations of this study

There are some limitations to this study. First, the association between advertising recall and perceptions of cigarettes and smoking was not examined. Therefore, our results are insufficient to interpret the effects of repeated exposure to cigarette advertisements and display at POS, especially convenience stores. Second, because this study targeted specific convenience stores, the results for recall not comparable. There may have been differences in the immediate recall because the type and number of advertisements varied from store to store. A future study should examine differences in recall, according to the site of the tobacco sales. Third, to reduce the non-sampling error, we trained the interviewers in advance, but the survey still had the same problems as a face-to-face interview.

### Conclusions

We found that the free recall performance of participants in their 20s was stronger than that of participants aged 50 and older, in smokers than in non-smokers, and in those who visited the convenience store 5–7 times per week versus 1–2 times a week. Moreover, participants expressed positive attitudes toward cigarette advertisements that they successfully recalled. The display and sale of tobacco products at the convenience store itself not only makes cigarettes a general commodity like other goods but also makes them recognizable because of repeated exposure, even if we do not remember the content of the advertisements. Repeated exposure to cigarette advertisements and displays can help to maintain a positive emotion about the products and increase the likelihood of purchasing cigarettes and the intent to smoke. Therefore, to protect adolescents from exposure to tobacco advertisements, to prevent smoking, and to create smoke-free environments, cigarette advertisements and displays at POS should be banned to denormalize and phase-out smoking and tobacco products in society.

### Conflict of interest

None declared.

### Acknowledgements

The authors thank the Korea Ministry of Health and Welfare and the Korea Health Promotion Institute.

### Authorship

JH, YY, JL, SL and YO designed the study. JH analyzed the data and wrote the article. SC contributed to the interpretation



of the results. YO was involved in manuscript revision and study supervisor. All authors reviewed and approved the final article.

## Funding

This work was supported by the Korea Health Promotion Fund (KHPF), Ministry of Health and Welfare, Republic of Korea.

## Ethics approval

This study was approved by the Institutional Review Board of the Korea Health Promotion Institute (No.1709-HR-009-01).

## References

- 1 Tye JB, Warner KE, Glantz SA. Tobacco advertising and consumption: evidence of a causal relationship. *J Public Health Pol* 1987;**8**(4): 492–508.
- 2 Henriksen L. Comprehensive tobacco marketing restrictions: promotion, packaging, price and place. *Tob Control* 2012;**21**(2):147–53.
- 3 Feighery EC, Ribisl KM, Schleicher N *et al*. Cigarette advertising and promotional strategies in retail outlets: results of a statewide survey in California. *Tob Control* 2001;**10**(2):184–8.
- 4 Pollay RW. More than meets the eye: on the importance of retail cigarette merchandising. *Tob Control* 2007;**16**(4):270–4.
- 5 Hoek J, Gifford H, Pirikahu G *et al*. How do tobacco retail displays affect cessation attempts? Findings from a qualitative study. *Tob Control* 2010;**19**(4):334–7.
- 6 Paynter J, Edwards R. The impact of tobacco promotion at the point of sale: a systematic review. *Nicotine Tob Res* 2009;**11**(1):25–35.
- 7 Robertson L, McGee R, Marsh L *et al*. A systematic review on the impact of point-of-sale tobacco promotion on smoking. *Nicotine Tob Res* 2015;**17**(1):2–17.
- 8 World Health Organization. Framework Convention on Tobacco Control. 2005.
- 9 Korea Ministry of Health and Welfare, Korea Ministry of Strategy and Finance, Korea Ministry of Security and Public Administration. *Government unveils anti-smoking measures*. Sejong-si, South Korea: Korea Ministry of Health and Welfare, 2014.
- 10 National Tobacco Control Center. *Tobacco Advertisement Status, Problems and Future Tasks of Tobacco Retailers in the Education Environment Absolute Protection Zone*. Seoul, South Korea: Korea Health Promotion Institute, 2016.
- 11 Euromonitor International Ltd. *Convenience Stores in South Korea*. 2018; <http://www.euromonitor.com/convenience-stores-in-south-korea/report>.
- 12 Kim IH, Bahk JW, Yoon TH *et al*. Income differences in smoking prevalences in 245 Districts of south korea: patterns by area deprivation and urbanity, 2008–2014. *J Prev Med Public Health* 2017;**50**(2): 100–26.
- 13 Feighery E, Ribisl K, Clark P *et al*. How tobacco companies ensure prime placement of their advertising and products in stores: interviews with retailers about tobacco company incentive programmes. *Tob Control* 2003;**12**(2):184–8.
- 14 Cho HJ. The status and future challenges of tobacco control policy in Korea. *J Prev Med Public Health* 2014;**47**(3):129–35.
- 15 National Cancer Institute. *The Role of the Media in Promoting and Reducing Tobacco Use. Tobacco Control Monograph No. 19*. Bethesda, MD: U.S. Department of Health and Human Services, National Institutes of Health, National Cancer Institute, 2008.
- 16 Bargh JA. Losing consciousness: automatic influences on consumer judgment, behavior, and motivation. *J Consum Res* 2002;**29**(2):280–5.
- 17 Albanese PJ. The unconscious processing information. *Marketing Theor* 2014;**15**(1):59–78.
- 18 Pechmann C, Stewart DW. Advertising repetition: a critical review of wearin and wearout. *JCIRA* 1988;**11**(2):285.
- 19 Robertson L, Cameron C, McGee R *et al*. Point-of-sale tobacco promotion and youth smoking: a meta-analysis. *Tob Control* 2016;**25**(e2):e83–9.
- 20 Wakefield M, Germain D, Durkin S *et al*. An experimental study of effects on schoolchildren of exposure to point-of-sale cigarette advertising and pack displays. *Health Educ Res* 2006;**21**(3):338–47.
- 21 Booth KL. *Methods for Conducting an On-site Visitor Questionnaire Survey*. Wellington, New Zealand: Science and Research Directorate, Department of Conservation, 1991.
- 22 Barlow T, Wogalter MS. Alcoholic beverage warnings in magazine and television advertisements. *J Consum Res* 1993;**20**(1):147–56.
- 23 Carter OBJ, Phan T, Mills BW. Impact of a point-of-sale tobacco display ban on smokers' spontaneous purchases: comparisons from postpurchase interviews before and after the ban in Western Australia. *Tob Control* 2013;**24**(e1):e81–6.
- 24 Wakefield M, Germain D, Henriksen L. The effect of retail cigarette pack displays on impulse purchase. *Addiction* 2008;**103**(2):322–8.
- 25 Carter OB, Mills BW, Donovan RJ. The effect of retail cigarette pack displays on unplanned purchases: results from immediate post-purchase interviews. *Tob Control* 2009;**18**(3):218–21.
- 26 He Y, Shang C, Huang J *et al*. Global evidence on the effect of point-of-sale display bans on smoking prevalence. *Tob Control* 2018;1–7.
- 27 McNeill A, Lewis S, Quinn C *et al*. Evaluation of the removal of point-of-sale tobacco displays in Ireland. *Tob Control* 2011;**20**(2):137–43.
- 28 Henriksen L, Flora JA, Feighery E *et al*. Effects on youth of exposure to retail tobacco advertising. *J Appl Soc Psychol* 2002;**32**(9):1771–89.
- 29 DiFranza JR, Wellman RJ, Sargent JD *et al*. Tobacco promotion and the initiation of tobacco use: assessing the evidence for causality. *Pediatrics* 2006;**117**(6):e1237–1248.
- 30 Hanewinkel R, Isensee B, Sargent JD *et al*. Cigarette advertising and adolescent smoking. *Am J Prev Med* 2010;**38**(4):359–66.
- 31 Hanewinkel R, Isensee B, Sargent JD *et al*. Cigarette advertising and teen smoking initiation. *Pediatrics* 2011;**127**(2):e271–278.
- 32 Lovato C, Watts A, Stead LF. Impact of tobacco advertising and promotion on increasing adolescent smoking behaviours. *Cochrane Libr* 2011;**10**.
- 33 Bogdanovica I, Szatkowski L, McNeill A *et al*. Exposure to point-of-sale displays and changes in susceptibility to smoking: findings from a cohort study of school students. *Addiction* 2015;**110**(4): 693–702.

- 34 Paynter J, Edwards R, Schluter PJ *et al.* Point of sale tobacco displays and smoking among 14–15 year olds in New Zealand: a cross-sectional study. *Tob Control* 2009;**18**(4):268–74.
- 35 Slater SJ, Chaloupka FJ, Wakefield M *et al.* The impact of retail cigarette marketing practices on youth smoking uptake. *Arch Pediatr Adol Med* 2007;**161**(5):440–5.
- 36 Na EY. Children and adolescents as respondents to advertising communication: characteristics and necessity of sanctions. *Korean J Consum Advertising Psychol* 2006;**7**(1):131–63.
- 37 Vaughn R. How advertising works: a planning model. *J Advertising Res* 1980;**20**(5):27–33.
- 38 Grimes A. Towards an integrated model of low attention advertising effects. *Eur J Marketing* 2008;**42**(1/2):69–86.
- 39 Zajonc RB. Attitudinal effects of mere exposure. *J Pers Soc Psychol* 1968;**9**(2p2):1.
- 40 Burton S, Clark L, Jackson K. The association between seeing retail displays of tobacco and tobacco smoking and purchase: findings from a diary-style survey. *Addiction* 2012;**107**(1):169–75.
- 41 Festinger LA. *Theory of Cognitive Dissonance*, Vol. 2. California: US: Stanford university press, 1962.
- 42 Telci EE, Maden C, Kantur D. The theory of cognitive dissonance: a marketing and management perspective. *Proc Soc Behav* 2011;**24**:378–86.