

공공 커뮤니케이션을 위한 웹툰: 건전한 복권 행동을 촉진하는 요인

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Using Webtoons for Public Service Communication: Factors Associated with Promoting Sound Lottery Behavior

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[요 약]

이 연구는 웹툰이 효과적인 공익 커뮤니케이션 수단으로 어떻게 활용될 수 있는지 검토하였다. 시청자 특성(연령, 자극 추구 성향)과 웹툰 메시지에 대한 반응(메시지 태도, 지각된 메시지 효과성)을 중심으로 웹툰이 건전한 복권 행동을 어떻게 촉진할 수 있는지 검토하였다. 한국 성인 1,997명을 대상으로 온라인 설문조사를 실시한 결과는 다음과 같다: (1) 연령은 메시지 태도, 지각된 메시지 효과성, 메시지 공유 의도와 긍정적인 연관성이 있었다; (2) 메시지 태도와 지각된 메시지 효과성은 메시지 공유 의도와 긍정적인 연관성이 있었다; (3) 연령은 메시지 태도와 지각된 메시지 효과성을 통해 메시지 공유 의도에 간접적으로 영향을 미쳤다; (4) 자극 추구 성향은 연령이 메시지 공유의도에 미치는 영향을 조절했다. 이 연구 결과를 바탕으로 이론적 및 실무적 시사점을 제 공했다.

[Abstract]

This study examines how webtoons can be used as an effective form of public service communication. Focusing on audience characteristics (age, sensation-seeking tendency) and responses to a webtoon message (message attitudes, perceived message effectiveness), we investigated how a webtoon can promote sound lottery behavior. An online survey conducted among 1,997 adults in South Korea yielded four main findings. First, age was positively related to attitudes toward the webtoon message, perceived message effectiveness, and intention to share the message. Second, message attitudes and perceived message effectiveness were positively related to intention to share the message. Third, age indirectly influenced the participants' intention to share the message through its effects on message attitudes and perceived message effectiveness. Fourth, sensation-seeking tendency moderated the effect of age on intention to share the webtoon message. Theoretical and practical implications based on these findings are discussed.

색인어 : 웹툰, 건전한 복권 행동, 자극추구 성향, 메시지 태도, 지각된 메시지 효과성

Keyword : Webtoons, Sound Lottery Behavior, Sensation-Seeking Tendency, Message Attitudes, Perceived Message Effectiveness

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I . Introduction

An increasingly popular type of digital media is webtoons, digital comics specifically designed for mobile devices. Now that many people read webtoons to entertain themselves during commuting and leisure time, public service communicators are beginning to explore how they can be used to promote healthy and responsible attitudes toward risky behaviors such as smoking, drinking, and gambling. Currently, however, little is known about whether and how webtoons can achieve this goal. To begin investigating this issue, the current study tests whether webtoons can be an effective tool for promoting prudent and socially responsible behavior. Focusing on the issue of lottery gambling in South Korea, we aim to identify specific audience characteristics and message characteristics that determine how webtoons that promote sound lottery behavior might achieve their intended effects.

Among the seven legal gambling industries in South Korea (lottery, sports betting, casinos, horse racing, track cycling, boat racing, and bull wrestling), the lottery accounts for 42.1% of total sales[1]. Some of the South Korean government's public communication about the lottery emphasizes its positive contributions, for example financing public programs, improving income distribution by supporting low-income families, and enhancing regional economic development[2]. However, the government and its lottery business affiliates also create and promote public communication campaigns that aim to curb problem lottery behavior. Particularly among men, the elderly, and low-income groups, problem lottery gambling can be a gateway activity that leads to riskier gambling behaviors and other harmful social effects such as domestic violence and suicide[3],[4].

To prevent problem lottery gambling, one of the government's affiliates, the Lottery Trustee Company, has been producing and disseminating public information messages via a webtoon titled *Alien Princess Superfan* [SSS급 외계공주의 덕질]. This webtoon is an example of educational entertainment that aims to promote sound lottery behavior and to discourage illegal online gambling, particularly among youths. *Alien Princess Superfan* consisted of 10 episodes that were serialized on KakaoPage, a web platform that curates webtoons, web novels, and other

digital culture. As of December 2023, this webtoon received about 640,000 total views. To study the effects of webtoons as public service communication, we investigated whether and how *Alien Princess Superfan* influenced people to disseminate its message about sound gambling behavior. To date, there is little existing research about the effectiveness of webtoons in inculcating prudent and socially responsible attitudes and behaviors. The current study represents an early effort to provide evidence-based guidance for public communicators to make the best use of this new digital platform across different target audiences, social issues, and contexts.

II. Literature Review

2-1 Webtoons as an Effective Digital Form of Public Communication

The South Korean webtoon industry has been growing since the early 2000s, and webtoons have become one of the most pervasive and powerful forms of digital serial production[5]. Between 2017 and 2021 the industry grew by 310%. Between 2018 and 2022, the number of webtoon users increased from 67.9% to 71.6%. The Naver Webtoon app accounts for 1.6% of total smartphone usage, which corresponds to 4.9 billion minutes[6]. This is equivalent to the amount of time that South Korean smartphone users spend on TikTok (2%), X (1.6%), and Netflix (1.3%). From 2021 to 2023, among the users of manga and webtoons between ages 10 to 69, over 62% used webtoons more than once a week, and 20% used them almost every day, particularly younger users[7].

Previous studies have examined a variety of features and effects of webtoons. Features that have been studied include webtoon content and message appeals over time[8]. Effects that have been studied include the following: undesirable effects of adult webtoons among youths in terms of sexual attitudes and gender egalitarianism[9]; and the relations among exposure to ads inserted into a webtoon, the relevance of those ads to the webtoon's content, attitudes toward the ad and the webtoon, webtoon loyalty, and intention to use the webtoon[10],[11].

Another webtoon effect that has begun to receive

attention is public communication[12]. One promising use of webtoons for public communication is entertainment education, which is the use of entertainment genres and formats to inform people about social issues and behaviors related to health and risks. To test the potential effectiveness of webtoons as entertainment education, the current study examines the interplay among audience characteristics and people's reactions to the webtoon message. The audience characteristics we focused on were age and sensation seeking tendency, and the reactions were attitudes toward the webtoon message and perceptions of its effectiveness.

2-2 Factors Associated with Webtoon Effects

1) Age

According to industry statistics, webtoons are enjoyed by people of all ages, but young people spend significantly more time reading them[7]. These data suggest that age may be an important factor contributing to an educational webtoon's effects on behavioral intentions. One survey study found that youths' positive evaluation of an antismoking webtoon was positively related to antismoking attitudes and behavioral intention[12]. To discourage illegal gambling and excessive lottery behavior among young audiences, the *Alien Princess Superfan* webtoon deployed various narrative and story characteristics that were intended to attract them. We therefore expected that young readers would be more likely to positively evaluate this webtoon's messages about sound gambling behavior, more likely to perceive those messages to be effective, and more likely to share those messages.

2) Sensation Seeking Tendency

Another trait that is likely to make readers positively evaluate a webtoon's messages and perceive them to be effective is sensation seeking tendency. Sensation seeking tendency is the propensity to pursue diverse, new, complex, and intense sensations and experiences[13]. It has been found to be significantly related to addictive behaviors such as pathological gambling, drug use, and binge drinking, as well as a determinant of people's interests and tastes regarding message stimuli[14]. Specifically, people with high sensation seeking tendency tend to report high levels

of message stimulation, attention, and expected behavioral changes[15]. Studies have also found that people with high sensation seeking tendency are more attracted to sensationalistic online content[16], and that they prefer content that is unique, exciting, and fast-paced[13]. Accordingly, we expected that sensation seeking tendency, coupled with age, would be related to the following: readers' positive attitudes toward the messages conveyed by the *Alien Princess Superfan* webtoon; the degree to which readers perceive the webtoon to be effective; and readers' intention to share its message about sound lottery behavior.

3) Message Attitudes

Audience characteristics may not be the only factors that determine willingness to do what a message directs. Research on the persuasive effects of prosocial messages and public service communication campaigns has found that people's attitude toward a persuasive message is an important precursor to desired effects such as the intention to do what the message encourages or recommends. According to a study on the effects of public service announcements, people's positive or negative evaluations of a message were related to their levels of support for the issue or actions featured in it[17]. In research on health communication and public service messages, feelings about a persuasive message are usually operationalized as *message attitudes*[17],[18]. Desired effects of message attitudes on persuasion have been found in communication about various health and social issues, for example smoking[19]. Based on such findings, we expected that webtoon readers with positive attitudes toward sound gambling behavior would be more likely to accept and share a webtoon's message about this issue.

4) Perceived Message Effectiveness

While message attitudes refer to favorable or unfavorable evaluations of the message, *perceived message effectiveness* refers to a person's subjective judgment about whether the message's target audience will find it to be persuasive[20]. Previous work has established that perceived message effectiveness is a causal antecedent to the actual effectiveness of persuasive messages in changing beliefs, attitudes, or behaviors[21]. Such findings suggest the utility of perceived message effectiveness as a valid as well as

efficient measure for actual effectiveness in public information campaigns[22]. A recent study evaluating a vaping prevention public service advertising campaign among adolescents found that the ads increased vaping risk beliefs and reduced attitudes and intentions, and that the adolescents' perceived message effectiveness were consistent with actual effectiveness results[23]. Perceived message effectiveness has also been used to test the persuasiveness of new digital formats such as multimedia location-based advertising messaging[24].

5) Research Questions and Hypotheses

Since webtoons are known to be more effective among younger people[7],[12], we expected that younger people would respond more favorably to the intended messages of *Alien Princess Superfan*.

- H1. Age will be negatively related to (a) message attitudes, (b) perceived message effectiveness, and (c) intention to share the webtoon message.

Next, based on findings that people's responses to a message (i.e., message attitudes and perceived message effectiveness) are directly related to their behavioral intentions[19],[21]–[22], we propose the following direct effect and mediation hypotheses.

- H2. (a) Message attitudes will be positively related to intention to share the message, and (b) perceived message effectiveness will be positively related to intention to share the message.
- H3. (a) Message attitudes will mediate the relationship between age and intention to share the message, and (b) perceived message effectiveness will mediate the relationship between age and intention to share the message.

As an audience characteristic, sensation seeking tendency has been known to moderate message effects, particularly among young people[14],[16]. Accordingly, we propose the following moderation hypothesis.

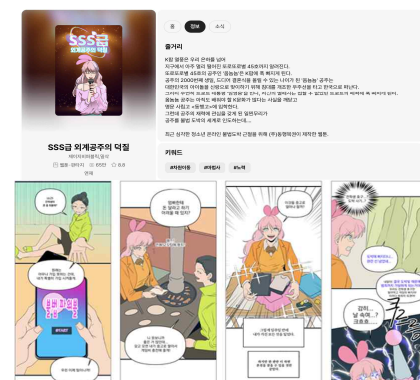
- H4. Sensation seeking tendency will moderate the relationships between (a) age and message attitudes, (b) age and perceived message effectiveness, and (c)

age and intention to share the message

III. Research Methods

3-1 Data Collection

The data analyzed for this study consist of responses to a large online survey conducted nationwide from January 26 to 31, 2024. Participants were recruited by a major online research firm. Potential recruits who reported that they had ever been professionally involved in the lottery or other types of gambling industries were excluded from participation. The total number of respondents used for the final analysis was 1,997, which included only adults who had bought lottery tickets at least once during the preceding year. The mean age was 44.07 ($SD=13.37$), and 58.09% were female. Those who agreed to participate in the survey were asked about their lottery buying tendencies and other relevant personal characteristics, their evaluations of the lottery webtoon messages, and demographic characteristics. Next, the survey provided a basic plot summary of *Alien Princess Superfan* as a cautionary tale about problem gambling, as well as some sample panels from the webtoon illustrating that theme (see Figure 1). After viewing these, participants were asked several questions about whether they thought the webtoon was effective (perceived effectiveness) and whether they would share its cautionary message about problem gambling (behavioral intention).



*Original images from the webtoon were used to accurately convey the intended meaning of the source material.

Fig. 1. *Alien Princess Superfan* story synopsis and sample panels

3-2 Measures

All the variables except for demographic characteristics were drawn from previous research and measured on a five-point Likert scale from "strongly disagree" to "strongly agree." *Sensation seeking tendency* was measured with a condensed version of sensation seeking scales used in previous studies[14],[25]. Our scale included the following four items: "(a) I would like to explore exotic places; (b) I like to do thrilling things; (c) I like new and exciting experiences, even if I have to break the rules; and (d) I prefer friends who are exciting and unpredictable." The composite score was constructed using the average of the four items ($M=2.97$, $SD=0.81$, $\alpha=.84$ [95% CI: .82, .85]). *Message attitudes* (MA) was measured with three items adapted from a previous study[17]: "This webtoon is (a) novel, (b) likable, and (c) interesting" [17]. A composite score was constructed using the average of the three items ($M=3.48$, $SD=0.75$, $\alpha=.87$ [95% CI: .86, .88]). *Perceived message effectiveness* (PME) was measured with the following three items drawn from a previous study[21]: "The content of this webtoon is (a) persuasive, (b) memorable, and (c) compelling." A composite score was constructed using the average of the three items ($M=3.07$, $SD=0.8$, $\alpha=.86$ [95% CI: .85, .87]). *Intention to share the message* (ISM) was measured with four items: "(a) I want to learn about this webtoon in more detail; (b) I intend to share this webtoon with my acquaintances; and (c) I will talk about this webtoon with my acquaintances." The three items were averaged to construct the variable ($M=2.62$, $SD=0.87$, $\alpha=.92$ [95% CI: .91, .92]). Confirmatory factor analysis (CFA) was conducted to evaluate the adequacy of the measurement model using the lavaan package in R 4.2.3. The results demonstrated an acceptable model fit (GFI = 0.956, AGFI = 0.932, CFI = 0.969, RMSEA = 0.069 [90% CI: 0.06, 0.07], SRMR = 0.028, TLI = 0.959). In addition, our model secured both convergent and discriminant validity based on the average variance extracted(AVE) criterion, factor loadings, and composite reliability(CR) for convergent validity, as well as the AVE square root and heterotrait-monotrait ratio(HTMT) for discriminant validity.

Table 1 presents descriptive statistics and bivariate correlations between the variables.

Table 1. Descriptive statistics and Pearson's correlations

Variable	M	SD	1	2	3	4
1. Age	44.07	13.37				
2. SST	2.97	0.81	-.11***			
3. MA	3.04	0.82	.06***	.11***		
4. PME	3.07	0.80	.08***	.13***	.84***	
5. ISM	2.62	0.87	.15***	.12***	.71***	.70***

Notes. $n = 1,997$; SST = sensation seeking tendency; MA = message attitudes; PME = perceived message effectiveness; ISM = intention to share the message; *** indicates $p < .001$.

3-3 Analytic Strategy

We used the PROCESS macro[26] in IBM SPSS 21.0 to test the mediation effect (Model 4) and moderated mediation effect (Model 8). The bootstrapping method with 5,000 resamples was used to generate bias-corrected confidence intervals (CIs), ensuring robust estimation of indirect and conditional effects. Mediation and moderated mediation effects were considered significant if the 95% CIs did not include zero. The analysis aimed to explore the relationship between age (X) and intention to share the message (Y) through two mediators: message attitudes (M1) and perceived message effectiveness (M2), with sensation seeking tendency (W) as the moderator. Participants' gender and education level (59% college enrolled/graduate) were included as covariates in the analysis.

IV. Results

First, not lower but higher age was significantly and positively related to (a) message attitudes($\beta=.006$, $t=4.007$, $p<0.001$; Table 2 Model 1), (b) perceived message effectiveness ($\beta=.006$, $t=4.526$, $p<0.001$; Table 2 Model 2), and (c) intention to share the message ($\beta=.006$, $t=5.929$, $p<0.001$; Table 2 Model 3). That is, younger readers, contrary to our expectations, were less likely than older readers to have the desired responses to the webtoon message. H1 was therefore not supported.

Second, message attitudes ($\beta=.447$, $t=15.241$, $p<0.001$) and perceived message effectiveness ($\beta=.359$, $t=11.920$, $p<0.001$) significantly and positively influenced intention to share the message (Table 2 Model 3). These findings support H2, which predicted

that readers who had positive attitudes toward the message and perceived it to be effective would be more likely to share it.

Table 2. Mediation model

Predictors	beta	SE	t	p	LLCI	ULCI
Model 1: Mediator variable model (MA)						
Age	.006	.001	4.007	<.001	0.003	0.009
Model 2: Mediator variable model (PME)						
Age	.006	.001	4.526	<.001	0.004	0.009
Model 3: Dependent variable model (ISM)						
Age	.006	.001	5.929	<.001	0.004	0.008
MA	.447	.029	15.241	<.001	0.390	0.505
PME	.359	.030	11.920	<.001	0.300	0.419

Notes. $n = 1,997$; Gender (coded as 1=male, 2=female) and education level were included as control variables but not shown in Table 2. Gender had a statistically significant positive effect on message attitudes ($\beta=0.177$, $p<.001$) and perceived message effectiveness ($\beta=0.143$, $p<.001$). Education level had a statistically significant negative effect on message attitudes ($\beta=-0.040$, $p=.053$) and perceived message effectiveness ($\beta=-0.061$, $p<.01$). Neither control variable was statistically significant in Model 3.

Third, the test of indirect effects further revealed that the relationship between age and intention to share the message was mediated by both perceived message effectiveness ($\beta=.002$, Boot $SE=.001$, 95% CI [0.001, 0.004]) and message attitudes ($\beta=.003$, Boot $SE=.001$, 95% CI [0.001, 0.004]), as the confidence intervals did not include zero. These results indicate that age indirectly influenced intention to share the message through its effects on perceived message effectiveness and message attitudes. Consequently, the likelihood of sharing the webtoon message increased with age and was mediated by enhanced message attitudes and perceived message effectiveness. Thus, H3 was supported.

Last, sensation seeking tendency did not moderate the effect of age on (a) message attitudes ($\beta=-.001$, $t=-0.383$, $p=0.701$; Table 3 Model 1) and (b) perceived message effectiveness ($\beta=-.003$, $t=-1.544$, $p=0.123$; Table 3 Model 2). However, in partial support of H4, sensation seeking tendency did moderate the effect of age on (c) intention to share the message ($\beta=.002$, $t=1.990$, $p<0.05$; Table 3 Model 3). These findings indicate that the effect of age on intention to share the message was contingent upon the level of sensation seeking tendency. Specifically, after examining the conditional direct effects of age on intention to share

the message, we found that the positive effect of age tended to increase at higher levels of sensation seeking tendency (when sensation seeking tendency is M-1SD: $\beta=0.005$, $p<.001$; when sensation seeking tendency is M: $\beta=0.007$, $p<.001$; when sensation seeking tendency is M+1SD: $\beta=0.009$, $p<.001$). Moreover, the conditional indirect effects shown in Table 4 illustrate that message attitudes and perceived message effectiveness significantly mediated the relationship between age and intention to share the message across different levels of sensation seeking tendency. Non-significant indices of moderated mediation for message attitudes (moderated mediation index=-.001, Boot 95% CI=[-0.002, 0.001]) and perceived message effectiveness (moderated mediation index=-.001, Boot 95% CI=[-0.002, 0.001]) indicate that the strength of mediation through message attitudes and perceived message effectiveness did not vary significantly with changes in sensation seeking tendency.

Table 3. Moderated mediation model

Predictors	beta	SE	t	p	LLCI	ULCI
Model 1: Mediator variable model (MA)						
Age	.009	.005	1.714	<.001	-0.001	0.019
SST	.172	.075	2.287	.022	0.025	0.320
Age*SST	-.001	.002	-0.383	.701	-0.004	0.003
Model 2: Mediator variable model (PME)						
Age	.015	.005	3.003	.003	0.005	0.025
SST	.264	.073	3.605	.001	0.120	0.407
Age*SST	-.003	.002	-1.540	.123	-0.006	0.001
Model 3: Dependent variable model (ISM)						
Age	-.001	.004	-0.160	.873	-0.001	0.007
MA	.444	.029	15.140	<.001	0.386	0.501
PME	.357	.030	11.813	<.001	0.298	0.416
SST	-.057	.054	-1.061	.288	-0.164	0.048
Age*SST	.002	.001	1.990	.047	0.000	0.005

Notes. $n = 1,997$; Gender (coded as 1=male, 2=female) and education level were included as control variables but not shown in Table 3. Gender had a statistically significant positive effect on message attitudes ($\beta=0.177$, $p<.001$) and perceived message effectiveness ($\beta=0.143$, $p<.001$). Education level had a statistically significant negative effect on message attitudes ($\beta=-0.040$, $p=.053$) and perceived message effectiveness ($\beta=-0.061$, $p<.01$). Neither control variable was statistically significant in Model 3.

Table 4. Conditional indirect effects of age at different values of sensation seeking tendency

Mediator	Sensation seeking tendency	Effect	Boot SE	Boot 95% CI
Message attitudes	2.25	.0033	.001	[0.0016, 0.0051]
	3.00	.0031	.001	[0.0018, 0.0045]
	3.75	.0029	.001	[0.0011, 0.0048]
Perceived message effectiveness	2.25	.0034	.001	[0.0020, 0.0050]
	3.00	.0027	.001	[0.0017, 0.0039]
	3.75	.0029	.001	[0.0006, 0.0036]

V. Discussion

This study investigated how webtoons that communicate public service messages about social issues might have desired effects on their target audience. The webtoon used as a test case, *Alien Princess Superfan*, was intended to promote sound lottery behavior, particularly among young people. The webtoon featured its main character, a princess from an alien planet who loves K-pop, visiting South Korea and being led astray by delinquent teen peers into a world of illegal gambling. This webtoon was created under the expectation that a new digital format that is popular among young people would have a relatively high likelihood of influencing them. However, one of our unexpected findings contradicted this expectation. We found that it was not younger but rather older people who had more favorable attitudes toward the webtoon's sound gambling message, and who also perceived the message to be more effective.

Several explanations are plausible. First, young people might have resisted the webtoon's message because they perceived it to have targeted them directly, whereas adults might have reacted to it more as a piece of entertainment than as an effort to control them. Second, the popularity of webtoons might have expanded beyond young people to other age groups, particularly after the COVID-19 pandemic[27]. Third, webtoons reflecting social concerns — in this case problem lottery gambling — are more likely to appeal to older rather than younger readers. Although webtoons are assumed to be more popular with young people, recent studies on webtoon readership demographics indicate that socially aware readers, who tend to be older, are also attracted to webtoons

for the social and cultural learning experiences they afford[28]. For example, the popular webtoon *Awl* [애월], which deals with labor issues and social inequality, resonated more strongly with older readers[29]. These preliminary findings suggest that the type of social issue featured in a webtoon will have different levels of popularity among different audience segments. In the case of the current study, problem lottery gambling may be an issue that does not hold much interest for younger readers.

In contrast to the unexpected findings regarding age, other findings support the hypotheses that people's positive reactions to the webtoon's sound gambling message would be significantly related to their intention to share it. These reactions — positive message attitudes and perceived message effectiveness — also mediated the relationship between age and intention to share the message. In both online and offline contexts, as well as newer and older digital message formats, either positive message attitudes or perceived message effectiveness have indeed been found to be significant determinants of persuasive messages' desired behavioral effects[17]–[19],[22]–[24]. These findings suggest that, before public service messages are finalized and disseminated in the media, they should be pretested with respect to these two variables.

Due to the nature of the lottery topic and the webtoon format for conveying the sound gambling message, not only age but other individual characteristics might have affected the persuasion process. For one, sensation seeking tendency played significant roles in the mechanisms of webtoon message effectiveness. Specifically, we found that the positive effect of age on intention to share the webtoon message increased among people with high sensation seeking tendency. This finding suggests that sensation seeking tendency, the lottery gambling topic, and the relatively novel digital webtoon format might have been compatible with one another. Future studies are needed to further explore and verify this and other compatibilities among personal psychological tendencies, public service message topics, and message formats or platforms.

Limitations are as follows. First, the message effect that we focused on was intention to share the message. While this is an important effect to study, future research should examine other important

behavioral effects of public service messages. In the context of problem lottery gambling, such effects would include discouraging behaviors such as buying tickets frequently and in large numbers, buying tickets while under the legal age limit, and viewing the lottery as a promising source of income. In addition, conducting a longitudinal study or experiment research could allow researchers to examine actual changes in people's lottery behavior.

Second, we examined age and sensation seeking tendencies as important personal characteristics that may affect readers' responses to the webtoon messages. However, there may be a variety of other important factors that could affect people's attitudinal responses, for example familiarity or engagement. Such factors should be further investigated to explore how public service webtoon messages can achieve their persuasive goals.

Despite these limitations, this study contributes to public service communication research through its investigation of the potential usefulness of webtoons for informing and persuading people to behave in prudent and socially responsible ways. Instead of assuming that the webtoon platform itself would be more likely to attract young people, public service communicators who use this platform should try to find appropriate matches among the featured social issue, the webtoon story context, and the intended target audience.

When public communicators try to make use of emerging digital media technologies, they need to examine the specific ways in which those technologies can promote their persuasive goals. As our findings suggest, these goals might be differentially aided or hindered by certain combinations of the target audience's characteristics with the characteristics of the persuasive messages and of the media formats in which they appear.

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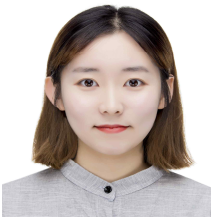
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