



# The role of socialization agents in adolescents' responses to app-based mobile advertising

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## ABSTRACT

This study examines how parents, peers, and media use affect adolescents' attitudinal and behavioral responses to app-based mobile advertising. A survey conducted with 603 smartphone users aged between 12 and 19 in Singapore suggests that parental factors, particularly control-based restrictive parental mediation, are more influential on younger adolescents than older ones. Findings also demonstrate that adolescents' susceptibility to normative peer influence makes them less critical about app-based mobile advertising, regardless of their age. Regarding the role of media use, adolescents' responses to app-based mobile advertising are more a function of perceived smartphone competency than the amount of time spent on smartphones.

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## Introduction

Smartphones have become an indispensable part of adolescent life. In Singapore, where this study was conducted, more than 80% of adolescents aged 15–19 are smartphone users (Hakuhodo DY Media Partners Inc 2018). Adolescents rely heavily on their smartphones to conduct a range of activities, including web browsing, social networking, and information research (Anderson and Jiang 2018; Grant and O'Donohoe 2007; Livingstone et al. 2011). These young users engage with their smartphones almost constantly, with 78% checking their phones at least once every hour (Common Sense Media 2016).

The prevalence of smartphone use among adolescents has made them a target of mobile advertising (Millward Brown 2017). New mobile capabilities allow advertisers to employ various marketing communications strategies that can reach young consumers anytime and anywhere. Among these mobile advertising and marketing tools, app-based practices directed at youths have raised concern among caregivers and lawmakers, as apps are integral to smartphone use and can expose young consumers to various privacy and security risks (Das et al. 2018; Federal Trade Commission 2012). Pew Research reported that teen mobile app users themselves worry about their

privacy and often avoid or uninstall apps due to privacy concerns (Madden et al. 2013). Despite these concerns, little research has examined how adolescents engage with new ad formats such as app-based mobile advertising, and what factors explain their approach (De Jans et al. 2017).

To address that gap, this study investigates adolescents' attitudinal and behavioral responses to app-based advertising and focuses on the role of socialization agents. To assess adolescents' attitudinal responses to app-based advertising, we examine the adolescents' attitudes toward advertisements displayed within mobile apps (in-app display advertising) as well as the data collection practices of those apps. To gauge adolescents' behavioral responses, we focus on their avoidance of in-app display advertising.

In our investigation of the roles played by socialization agents, we focus on three types of agents – parents, peers, and media. Socialization agents refer to individuals or organizations that transform the norms, attitudes, motivations, and behaviors of youth (John 1999). Consumer socialization theory suggests that young people acquire and develop consumption-related attitudes and behaviors through their interactions with various socialization agents (John 1999). While an increasing number of studies has explored the roles that parents play in children's consumer socialization (Kim, Yang, and Lee 2015), limited research has investigated parental influence on adolescents' consumption of mobile media (Hwang et al. 2017). Moreover, not much is known regarding the role of peer influence in adolescents' mobile media use, even though peers play a crucial role in adolescents' social learning and development (Bukowski, Brendgen, and Vitaro 2007). Prior studies also suggest that media can play an important role in consumer socialization, as media outlets of various sorts constitute an essential source of marketplace information (John 1999). In the adult space, a wealth of studies using adult samples has examined how emerging media influence the way consumers respond to, and interact with, advertising (e.g., Bellman et al. 2013; Bellman et al. 2011; Sharp, Danenberg, and Bellman 2018). However, it is unclear how adolescents' media use and perceptions influence their responses to the new advertising strategies.

We focus on two age groups in this study, classifying them as younger (aged 12–14) and older (aged 15–19) adolescents. This dichotomy is in keeping with the Center for Disease Control and Prevention's definition of young teens (12–14 years) and teenagers (15 years and older). We examined these two age groups discretely on the logic that the importance of socialization agents changes according to children's growing pursuit of independence (Opgenhaffen et al. 2012). Parents of older youths often impose fewer media rules and allow more freedom for their children, as older youths tend to spend more time with peers and the media than with their parents (Shin and Lwin 2017). Older adolescents are also more likely to resist parental intervention owing to a greater need for autonomy (Lwin, Stanaland, and Miyazaki 2008).

Given that adolescents are an important consumer segment for advertisers (Lapierre, et al. 2017), and that their heavy usage of smartphones exposes them to various mobile advertising practices and risks (Das et al., 2018; Madden et al. 2013), understanding adolescents' responses to mobile advertising and the factors associated with their decisions is important for parents, educators and authorities. The findings from this study may offer a better understanding of the role that socialization agents play in the young consumers' formation of marketplace attitudes and behaviors in a changing advertising landscape,

providing parents and media educators with evidence-based strategies to ensure greater child advertising literacy. The findings will also help advertisers to better understand the differences in attitudinal and behavioral responses to app-based mobile advertising among younger and older adolescents, which can (1) inform strategies to effectively advertise to each of these segments, and (2) highlight potential ethical concerns that advertisers may take note of in targeting each of these segments.

## App-Based mobile advertising

A mobile application (app) is a “software application developed specifically for use on small, wireless computing devices such as smartphones and tablets” (TechnoKeens.com 2016). With the advent and expansion of smartphones, the app market has rapidly grown over the past few years. Apple’s App Store has expanded from around 3,000 apps in 2008 to 2.2 million apps in 2017 (Statista 2018a). The Google Play Store saw similar growth trajectories, with less than 16,000 apps in 2009 and 3.5 million apps in 2017 (Statista 2018b). These apps now offer a wide variety of media content for all age groups, including children and adolescents (Das et al. 2018). According to Flurry Analytics (2018), app use constitutes 90% of time that consumers spend on mobile devices. Specifically, adolescents spend an average of 173 minutes per day of their time on smartphones, with 130 minutes spent on mobile app use (Bentley et al. 2015).

In response to this market trend, many advertisers conceptualize, develop and distribute their own apps or place ads within third-party apps (also called *in-app display advertising*). However, both the apps developed by advertisers and the in-app advertisements displayed within apps have raised concerns among parents and policy-makers. One of the most pressing issues in relation to apps developed by advertisers is that developers often collect a wide range of personal information such as users’ locations, contact details, and other sensitive data with or without users’ knowledge and consent (Cohen and Yeung 2015). This is often done to provide targeted marketing. At the same time, such information can be used to infer the identity of the users and allow advertisers to use data to feed into advertising messages (Park and Mo Jang 2014). Even more concerning is that some apps do not provide information on how personal data collected from young consumers are managed and used. Among the top downloaded apps in both the Apple App Store and Google Play Store, at least 29% of apps still do not contain a privacy policy or have privacy policies that are not easily accessible (Future of Privacy Forum 2016). With the advent of the General Data Protection Regulation (GDPR) in Europe (EU 2016/679), app developers targeting consumers there are now required to provide app users with privacy policies and obtain explicit consent before collecting personal information from them (PrivacyPolicies.com, 2019). However, research also suggests that privacy policies provided by mobile apps are not comprehensible by young consumers. Das et al. (2018) analyzed the readability of privacy policies for the highest-ranked mobile apps targeted to youth and found out that the average reading grade level (RGL) of those policies were well above the average reading level of adults in the US.

Aside from apps themselves, in-app advertising has also raised concerns. As location- and behavior-tracking technologies available in smartphones allow advertisers to reach

consumers with contextually relevant and targeted messages, smartphone users often receive personalized advertising messages when using apps (Kang and Shin 2016). Consumers may sometimes find personalized mobile advertising messages useful and relevant (Baek and Yoo 2018; Feng, Fu, and Qin 2016). However, given that these personalized offerings are created only when advertisers access consumers' personal information, consumers may feel vulnerable to privacy risks when they receive personalized advertising messages via smartphones (Gutierrez et al. 2019; Kang and Shin 2016; Youn and Shin 2019). Furthermore, even though not all in-app advertisements utilize user information, parents may not want their children to be exposed to ads, especially since that exposure may lead youths to inappropriate websites or encourage them to make unauthorized in-app purchases (Federal Trade Commission 2012).

In general, the current app-based advertising practices targeted to youths entail notable risks. To address these issues, several countries have introduced legislation and guidelines that prevent online and mobile marketers from promoting child-inappropriate products to children or collecting personal information without parental consent. These include the Children's Online Privacy Protection Act (COPPA) in the US, the Singapore Code of Advertising Practice (SCAP), the Code for Advertising and Marketing Communications to Children by the Australian Association of National Advertisers, and the aforementioned GDPR. However, the existing laws and guidelines tend to focus on younger consumers (12- to 14-years-old or younger), leaving older adolescents (15+) largely unprotected from the risks associated with app-based advertising. COPPA, for example, does not apply to youths older than 13-years-old. Although GDPR requires marketers to obtain parental consent before collecting data from children under the age of 16, this EU-wide legislation allows member states to be flexible in their decision regarding the age threshold (with the lowest set at 13). As of January 2019, many countries have set the age of consent at 13 (Belgium, Denmark, Finland, Latvia, Malta, Sweden, the UK) and 14 years (Austria, Cyprus, Italy, Lithuania, Spain), leaving adolescents aged 15 and older vulnerable (Milkaite and Lievens, 2019).

When regulations are insufficient to protect youth from marketers, the social environment and socialization agents can play a crucial role in shaping and developing young consumers' understanding of and response to advertising (Shin, Huh, and Faber 2012). In this regard, the current study examines the role of socialization agents (parents, peers, and media) in adolescents' responses to advertising, using the consumer socialization perspective as a theoretical framework that guides the inquiry.

## **Consumer socialization and the role of socialization agents**

Consumer socialization refers to a multi-faceted process by which young consumers learn a wide range of consumption-related attitudes, knowledge, and behaviors through their interactions with various socialization agents – individuals or organizations that influence the way young consumers acquire consumption-related learning (John 1999; Moschis and Churchill Jr. 1978). When the consumer socialization of young people is examined in media contexts, studies have investigated how youths' interactions with socialization agents influence their knowledge of and responses to media or messages, including advertising (Mangleburg and Bristol 1998; Shin, Huh, and Faber 2012; Newman and Oates 2014).

## ***Parental mediation***

The role of parents in children's media use has been extensively documented in studies examining the effects of parental mediation, defined as the strategies that parents employ to monitor and supervise children's media use (Clark 2011; Warren 2001). Although parental influence tends to decline as a child reaches adolescence (John 1999), prior research suggests that parents' active involvement in media education and supervision can mitigate negative media influences on adolescents (Livingstone and Helsper 2008).

In both traditional and new media contexts, research suggests that communication-based mediation (i.e., active parental mediation) is more effective than control-based mediation (i.e., restrictive parental mediation) (Lee, Lee, and Lee 2016; Shin and Kang 2016; Warren 2001). The former is more likely than the latter to foster critical thinking skills and consumer skepticism in youth, as it gives parents a chance to explain their perspectives on media and offers an opportunity for their children to ask questions about the parents' views on media (Fujioka and Austin 2003). While restrictive parental mediation can mitigate negative media influences on children by limiting child access to media (Livingstone and Helsper 2008), researchers have also noted that too much restriction can backfire, especially when it is imposed on older adolescents with a growing need for independence (Lee, Lee, and Lee 2016; Lwin, Stanaland, and Miyazaki 2008; Sasson and Mesch 2014).

Similar insights have emerged from research focusing specifically on parental mediation of advertising. Buijzen and Valkenburg (2005) noted that active mediation was more effective in reducing children's advertising-induced materialism and parent-child conflicts. In another study, Buijzen (2009) found that active parental mediation of advertising led to lower ad-induced consumption of unhealthy foods. However, restricting exposure to advertisements was only effective among younger children.

Drawing support from the parental mediation literature, we hypothesize that active parental mediation will be associated with positive socialization outcomes (i.e., critical responses to in-app marketing practices) for both younger and older adolescents, whereas restrictive parental mediation will lead to reactance among older adolescents, resulting in less desirable outcomes:

**H1.** For younger adolescents (aged 12–14), both active and restrictive parental mediation will be associated with more critical responses to app-based advertising practices (i.e., negative attitudes towards in-app display advertising, negative attitudes towards personal information collection by apps, and a tendency to avoid in-app display advertising).

**H2.** For older adolescents (aged 15 and older), active parental mediation will be associated with more critical responses to app-based advertising practices, whereas restrictive parental mediation will not.

## ***Peer influence***

Consumer socialization research suggests that adolescents' interactions with peers can result in both positive and negative outcomes. For example, Kamaruddin and Mokhlis (2003) found that the adolescents' interpersonal communication with peers led them to more carefully and systemically search for the best value before making purchase decisions. However, Moschis and Churchill Jr. (1978) showed that adolescents'

communication with peers regarding products and services resulted in greater materialism. In the context of media consumption, Davis (2013) identified online peer communication as a positive predictor of friendship quality, which led to greater self-concept clarity (i.e., the degree to which one's self-belief is confidently and clearly defined) among adolescents. However, Shin and Lwin (2017) found that adolescents' talking with peers regarding internet-related issues was positively associated with their engagement in risky online behaviors. Regarding the adolescents' responses to advertising in new media, Zarouali et al. (2018) revealed that adolescents showed less persuasion knowledge from and a more positive attitude towards social media newsfeed advertising when they engaged in peer communication with classmates.

Regarding the mixed findings on peer influence, Mangleburg and Bristol (1998) suggested that an adolescent's type of susceptibility to peer influence may play an important role. Susceptibility to interpersonal influence consists of two dimensions: normative and informative. Susceptibility to normative influence denotes one's tendency to conform to the wishes and expectations of others, whereas susceptibility to informational influence reflects one's tendency to accept information from others (Roberts, Manolis, and Tanner 2008). In media usage situations, adolescents' susceptibility to normative peer influence can be reflected through the extent to which they conform with peers regarding media choices, whereas informational susceptibility is based on the degree to which they learn about media by seeking information from peers.

Revealing that adolescents' advertising skepticism was negatively associated with their susceptibility to normative peer influence but positively related to informational peer influence, Mangleburg and Bristol (1998) argued that adolescents' susceptibility to different types of peer influence might have diverse effects on their responses to advertising. Specifically, they suggested that adolescents who tend to conform to peers to enhance their self-esteem and/or to receive rewards by fitting in with the peer group (i.e., those who are susceptible to normative peer influence) would be more likely to accept advertising messages that often portray what is in vogue and accepted in society. This, in turn, would make adolescents less critical about advertising. On the other hand, marketplace information provided by peers may help adolescents to become more knowledgeable about the marketplace. Therefore, adolescents' susceptibility to informational peer influence would make them more critical about advertising.

Several empirical studies have provided support for Mangleburg and Bristol's (1998) argument on the role of normative peer influence by demonstrating positive associations between adolescents' susceptibility to normative peer influence and negative consumer socialization outcomes such as materialism, compulsive buying, and deception in purchasing (Bristol and Mangleburg 2005; Roberts, Manolis, and Tanner 2008). Those studies suggest that normative peer influence makes adolescents less skeptical towards advertising and more vulnerable to advertising influence, regardless of their age.

The role of informational peer influence, however, is less evident. Mangleburg, Doney, and Bristol (2004) showed that adolescents' susceptibility to informational peer influence was positively associated with their enjoyment of shopping with friends. Moscardelli and Liston-Heyes (2004) demonstrated a positive association between adolescents' susceptibility to informational peer influence and the degree to which they are concerned about online privacy. In both studies, however, it is unclear whether

informational peer influence makes adolescents more critical about marketing practices. For example, although privacy concerns could make adolescents more critical about the advertisers' information collection practices (Youn 2008), studies have also demonstrated that one's privacy concerns are not always positively associated with information protection behaviors (Sundar et al. 2013). Thus, we present the following hypothesis on normative peer influence and a research question on informational peer influence:

**H3.** For both younger and older adolescents, their susceptibility to normative peer influence will be associated with less critical responses to app-based advertising practices.

**RQ1.** How is adolescents' susceptibility to informational peer influence associated with their responses to app-based advertising practices?

### **Media influence**

Media are important information sources through which young consumers learn about consumption norms and values (John 1999). This is especially true for youths today, who are inundated with advertising and marketing messages through multiple media channels. Similar to the outcomes of peer influence, the outcomes of consumer socialization through media use have been found to be both positive and negative. On the positive side, media can help children obtain marketplace knowledge and develop a healthy level of skepticism (Mangleburg and Bristol 1998). Conversely, research has also shown that the extent to which adolescents use the internet is negatively associated with advertising skepticism (Moscardelli and Liston-Heyes 2004) and positively related to their exposure online risks (Livingstone and Helsper 2008; Shin and Kang 2016).

In addition to the amount of time spent on media, studies suggest that the way adolescents perceive themselves as media users also influences their media use. Research shows that individuals who are confident about using media technologies are more likely to actively manage their privacy on the internet and smartphones (Kang and Shin 2016). However, another stream of research suggests that young people's confidence in media skills can lead them to be more optimistic about their ability to avoid risks associated with media use. Livingstone and Helsper (2008) showed that the degree to which adolescents feel confident about their internet skills is positively associated with their engagement in risky online behaviors.

Overall, the literature poses several possibilities. First, adolescents' media use and perceived competence could make them more knowledgeable about advertising practices, but those factors may also lead adolescents to be less concerned about media influence, and consequently, more vulnerable to it. Second, with regard to the role of age, a survey conducted by the Pew Research Center showed that older adolescents aged 15–17 were more likely to own smartphones and to have greater access to the internet using their mobile devices compared to the younger counterparts aged 13–14 (Lenhart 2015). This possibly makes older adolescents more likely to be targeted and influenced by mobile advertising. However, research also suggests that younger adolescents are more likely to be vulnerable than older adolescents to negative media influence, due to less media experience and lower levels of skepticism (Espinoza and Juvonen 2011). In consideration of the mixed empirical findings and competing possibilities regarding media influence on different age groups of adolescents, along with



the lack of research on adolescents' smartphone use and their responses to mobile marketing practices, we propose the following research question:

**RQ2.** How are time spent on smartphones and perceived smartphone competency associated with younger vs. older adolescents' responses to app-based advertising practices?

## Method

### Procedures

We collected data from a sample of smartphone users aged between 12 and 19 at five public schools (three secondary schools and two polytechnics) located in different regions of Singapore. To gain a more balanced understanding, we selected both secondary schools and polytechnics, as these two forms of educational institutions cater to the post-elementary and pre-university cohorts in Singapore. A two-stage cluster sampling method was used to recruit the participants. At the first stage, approximately 40 schools were randomly selected and invited, with five schools agreeing to participate. At the second stage, one or two classes from each level at each participating school were randomly selected to take part in the study.<sup>1</sup>

On the scheduled survey date, students with parental permission read an informed consent form explaining that their participation was voluntary and anonymous. During the data collection, a research assistant and teacher-in-charge were present to administer the survey in class. Each survey session took between 20 and 30 minutes. Each participant was given a S\$5 voucher upon completion of the survey as a token of appreciation.

A total of 756 students were invited to the survey and 607 of them completed the questionnaire. Among those who completed the questionnaire, 603 reported to use smartphones. Since this study examines smartphone users' responses to mobile marketing, only data collected from smartphone users were used for this study. The definition of a smartphone – “a mobile phone that allows you to do any of the following: browse the internet, download applications (apps), send email, and communicate through voice and video” – was provided in the questionnaire.

### Measures

*Parental mediation* was assessed by asking respondents to rate how often their parent or guardian who spent the most time with them at home engaged in active and restrictive parental mediation regarding their use of smartphones. Measurement items were constructed based on prior research on parental mediation of teenagers' internet use (e.g., Livingstone et al. 2011). Six items measuring *active parental mediation* assessed parents' explaining to their adolescent children about content presented on smartphones and helping adolescents understand safety issues. The other six items measuring *restrictive parental mediation* pertained to parents' restricting and monitoring their adolescents' access to smartphones and mobile content.

*Susceptibility to peer influence* was measured using seven items derived from Mangleburg and Bristol (1998). The items assessed two types of susceptibility to peer influence in regard to the choice of mobile apps: Three items measured adolescents' *susceptibility to normative peer influence* and four assessed *susceptibility to informational peer influence*.



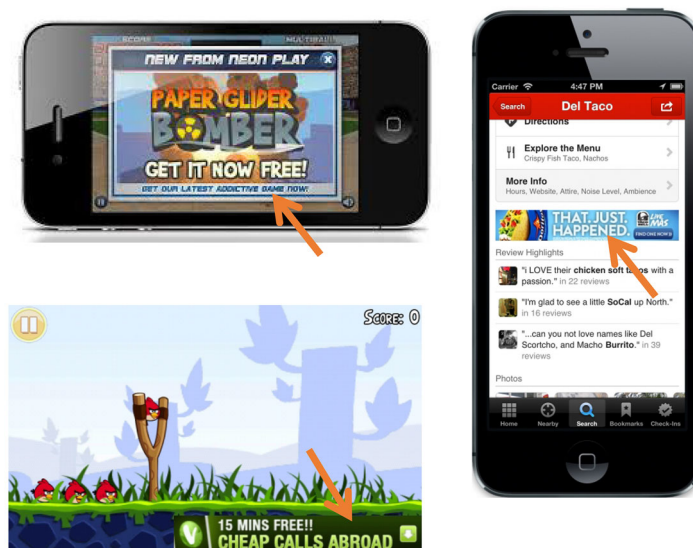
*Time spent on smartphones* was measured by a single question asking respondents to indicate the amount of time they spent on their smartphones per day (1 = "less than an hour per day"; 5 = "7 hours or more a day"). The median was 4 = "5 to 6 hours per day" (29.7%) and the mode was 3 = "3-4 hours per day" (30.1%).

*Perceived smartphone competency* was determined by asking the respondents to indicate the extent to which they feel confident about using a smartphone in order to undertake various activities. Seventeen activities that are commonly performed using smartphones derived from prior studies on smartphone usage (Ofcom 2014) were listed. The item scores were averaged to construct a composite scale.

*Attitude towards in-app display advertising* was measured by asking respondents to indicate how they feel about advertisements that they may come across when they use mobile apps. Before asking this question, the definition and examples of in-app display advertising were provided as presented in Figure 1.

*Attitude towards personal information collection by apps* was assessed by asking respondents to indicate how they feel about mobile apps collecting personal information from their smartphones. The following statement was provided to explain how

When you use mobile apps, you may come across advertisements that promote brands, products, or services. Such advertisements are called in-app display advertisements. Below are some of the examples of in-app display advertisements.



**Figure 1.** Definition and examples of in-app display advertising.

Sources. (top left screen) <https://www.google.com.sg/url?sa=i&rct=j&q=&esrc=s&source=images&cd=&cad=rja&uact=8&ved=0CAcQjRxqFQoTCOOlhZwpcCFQqGjgodHo0Gjw&url=http://www.appfreak.net/mobile-app-marketing/&ei=eVrMVaOFaoSMuA5empr4CA&bvm=bv.99804247,d.c2E&psig=AFQjCNHii10JIAucn7MWQQMQMLenYT-Xg&ust=1439542229769832>

(bottom left screen) <https://www.google.com.sg/url?sa=i&rct=j&q=&esrc=s&source=images&cd=&cad=rja&uact=8&ved=0CAcQjRxqFQoTCLC8ncvhpccCFRAjgod2-cBig&url=http://www.wordstream.com/online-ads&ei=m2XMFcCHJDGuATbz4fQCA&bvm=bv.99804247,d.c2E&psig=AFQjCNErvPsLcaorR38ky1qhO5WDobnc7A&ust=1439545109896952>

(right screen) [https://www.google.com.sg/url?sa=i&rct=j&q=&esrc=s&source=images&cd=&cad=rja&uact=8&ved=0CAcQjRxqFQoTCovaxJXgpcCFUpYjgodl4ML\\_g&url=http://www.localpositions.com/yelp-offering-display-advertising/&ei=HmTMVevTGcrkuQsXh67wDw&bvm=bv.99804247,d.c2E&psig=AFQjCNGqnr3HCIFpV-jOBYGk0fbJPqliA&ust=1439544724686749](https://www.google.com.sg/url?sa=i&rct=j&q=&esrc=s&source=images&cd=&cad=rja&uact=8&ved=0CAcQjRxqFQoTCovaxJXgpcCFUpYjgodl4ML_g&url=http://www.localpositions.com/yelp-offering-display-advertising/&ei=HmTMVevTGcrkuQsXh67wDw&bvm=bv.99804247,d.c2E&psig=AFQjCNGqnr3HCIFpV-jOBYGk0fbJPqliA&ust=1439544724686749)

apps could collect personal information from one's smartphone: "Before or after downloading apps, some apps require that they need to access or collect your personal information on your smartphone, such as contact lists, photographs, device IDs and location information."

*In-app display advertising avoidance* was measured with five items adapted from prior research on advertising avoidance (Cho and Cheon 2004).

Table 1 displays the measurement items, scales, and their descriptive statistics.

Herman's single factor test and the common latent factor (CLF) technique were used to determine whether there were any common method bias resulting from common method variance (i.e. "variance that is attributable to the measurement method rather than to the constructs the measure present" (Podsakoff, MacKenzie, Lee, and Podsakoff 2003, p. 879). The analyses confirmed that the responses were not subject to common method bias.

## Results

The final sample ( $N = 603$ ) consisted of 48.7% male and 51.3% female students with a mean age of 15.2 ( $SD = 1.96$ ). 42% of the respondents were between 12 and 14 years old and the rest were aged 15 and above. In terms of ethnicity, 66.5% were Chinese, 17.5% Malay, 9.3% Indian 9.3%, and 6.7% others, which is fairly representative of the national population.

Before testing the hypotheses and research questions, the two age groups (younger and older) were compared for the key variables using a series of independent *t*-tests. Table 2 shows that younger adolescents receive higher levels of both active and restrictive parental mediation, are less susceptible to informational peer influence, spend less time on smartphones, and feel less confident in their smartphone skills as compared to the older counterparts. However, in comparison to older adolescents, younger adolescents are less likely to avoid in-app advertising. The two groups are not significantly different in terms of their susceptibility to normative peer influence and attitudes towards in-app display advertising and apps collecting personal information.

To test the hypotheses and research questions, we ran multiple regression analyses for two different age groups (young adolescents aged 12–14 and old adolescents aged 15+), entering the socialization factors (parental mediation, susceptibility to peer influence, time spent on smartphone, and smartphone competency) as independent variables and adolescents' attitudinal and behavioral responses to app-based advertising (attitudes towards in-app display advertising, attitudes towards personal information collection by apps, and in-app display advertising avoidance) as dependent variables. For each regression analysis, the values of variance inflation factors (VIF) ranged between 1.00 and 2.30, revealing no multicollinearity. Table 3 (young adolescents) and Table 4 (old adolescents) display the results.

H1 proposed that both active and restrictive parental mediation would result in more positive consumer socialization outcomes among younger adolescents (i.e. negative attitudes towards in-app display advertising, negative attitudes towards personal

**Table 1.** Measurement and descriptive statistics.

| Construct and measurement items   | Mean (SD) / % |
|---|---------------|
| <i>Active parental mediation</i> ( $M = 2.46$ , $SD = 1.03$ , $\alpha = .94$ ) (1 = Never, 2 = Rarely; 3 = Sometimes; 4 = Often, 5 = All the time)  |               |
| <i>My parent/guardian who spends the most time with me ...</i>  |               |
| Explains why some mobile apps and contents are good or bad.   | 2.35 (1.07)   |
| Tries to help me understand what I see on a smartphone.   | 2.36 (1.14)   |
| Explains what something shown on a smartphone really means.   | 2.29 (1.12)   |
| Explains whether things that appear on a smartphone are acceptable or not.  | 2.42 (1.16)   |
| Explains how to use a smartphone safely.  | 2.63 (1.26)   |
| Explains how to protect personal information on a smartphone.   | 2.78 (1.26)   |
| <i>Restrictive parental mediation</i> ( $M = 2.53$ , $SD = 1.04$ , $\alpha = .90$ ) (1 = Never, 2 = Rarely; 3 = Sometimes; 4 = Often, 5 = All the time)   |               |
| <i>My parent/guardian who spends the most time with me ...</i>  |               |
| Limits the amount of time I may spent on a smartphone.  | 2.88 (1.31)   |
| Limits the time of the day I may use a smartphone.  | 2.63 (1.32)   |
| Specifies in advance the mobile applications that I can use or websites that I can visit on a smartphone  | 2.17 (1.11)   |
| Forbids me to use certain mobile apps or visit certain websites on a smartphone   | 2.22 (1.22)   |
| Limits the types of personal information I can share or give out on a smartphone  | 2.54 (1.28)   |
| Prevents me from talking to or chatting with strangers on a smartphone  | 2.78 (1.43)   |
| <i>Susceptibility to normative peer influence</i> ( $M = 2.53$ , $SD = .93$ , $\alpha = .86$ ) (1 = Strongly disagree, 2 = Disagree; 3 = Neutral; 4 = Agree, 5 = Strongly agree)                |               |
| When downloading/using apps, I usually download/use the ones that I think my friends will approve of.   | 2.57 (1.04)   |
| I like to know what apps make a good impression on my friends.  | 2.65 (1.08)   |
| It is important that my friends like the apps I use.  | 2.35 (1.03)   |
| <i>Susceptibility to information peer influence</i> ( $M = 2.82$ , $SD = .96$ , $\alpha = .88$ ) (1 = Strongly disagree, 2 = Disagree; 3 = Neutral; 4 = Agree, 5 = Strongly agree)              |               |
| If I don't have a lot of experience with an app, I often ask my friends about it.   | 3.06 (1.08)   |
| I often ask my friends advice/opinions when choosing to download an app.  | 2.76 (1.12)   |
| I often get information about an app from friends before I buy.   | 2.70 (1.16)   |
| To make sure that I download/use the right app, I often look at what my friends are downloading and using.  | 2.74 (1.12)   |
| <i>Time spent on smartphones</i>  |               |
| Less than 1 hour per day  | 2.5%          |
| 1-2 hours per day   | 12.5%         |
| 3-4 hours per day   | 30.1%         |
| 5-6 hours per day   | 29.7%         |
| 7 hours or more per day   | 25.2%         |
| <i>Perceived smartphone competency</i> ( $M = 3.95$ , $SD = .67$ , $\alpha = .92$ ) (1 = Not at all confident, 2 = Not very confident; 3 = Neutral; 4 = Somewhat confident, 5 = Very confident) |               |
| Send or post messages   | 4.22 (0.85)   |
| Arrange to meet friends   | 4.04 (0.96)   |
| Download and install apps   | 4.09 (0.94)   |
| Use social media  | 4.25 (0.92)   |
| Play games  | 4.03 (1.02)   |
| Connect to the Internet through Wi-Fi or a data network (e.g., 3G, 4G)  | 4.40 (0.83)   |
| Video call or video chat  | 3.26 (1.24)   |
| Listen to music   | 4.46 (0.86)   |
| Get directions, recommendations, or other information related to a location   | 3.61 (1.12)   |
| Upload or send files and pictures   | 3.84 (1.02)   |
| Take pictures or record video   | 4.10 (0.98)   |
| Calling friends or family   | 4.39 (0.82)   |
| Discuss school work (e.g., projects, homework, etc.)  | 4.01 (0.96)   |
| Sell or buy stuff   | 2.73 (1.33)   |
| Watch videos  | 4.28 (0.89)   |
| Read news or other information  | 3.71 (1.12)   |
| Send/receive emails   | 3.58 (1.16)   |
| I talk with my friends about Facebook newsfeed ads.   | 2.42 (1.26)   |
| I ask my friends questions about Facebook newsfeed ads.   | 2.35 (1.23)   |
| I obtain information about Facebook newsfeed ads from my friends.   | 2.34 (1.23)   |

(continued)

**Table 1.** Continued.

| Construct and measurement items  | Mean (SD) / % |
|--|---------------|
| <i>Attitude towards In-App display advertising</i> ( $M = 1.74$ , $SD = .84$ , $\alpha = .94$ )  |               |
| Not entertaining (1) – Entertaining (5)  | 1.73 (0.97)   |
| Not pleasing (1) – Pleasing (5)  | 1.71 (0.91)   |
| Not enjoyable (1) – Enjoyable (5)  | 1.68 (0.93)   |
| Unimportant (1) – Important (5)  | 1.66 (0.91)   |
| Uninformative (1) – Informative (5)  | 1.86 (1.00)   |
| Not useful (1) – Useful (5)  | 1.79 (0.99)   |
| <i>Attitude towards personal information collection by apps</i> ( $M = 2.69$ , $SD = .82$ , $\alpha = .92$ )   |               |
| Very negative (1) – Very positive (5)  | 2.84 (0.89)   |
| Very good (1) – Very bad (5)   | 2.80 (0.89)   |
| Dislike it (1) – Like it (5)   | 2.56 (0.99)   |
| Intrusive (1) – Not intrusive (5)  | 2.58 (0.93)   |
| <i>In-App Display Advertising Avoidance</i> ( $M = 4.34$ , $SD = .74$ , $\alpha = .88$ ) (1 = Strongly disagree, 2 = Disagree; 3 = Neutral; 4 = Agree, 5 = Strongly agree) |               |
| I intentionally ignore in-app display advertising.   | 4.27 (0.88)   |
| I intentionally don't click on any in-app display advertisements, even if the advertisements draw my attention.  | 4.19 (0.96)   |
| I hate in-app display advertisements.  | 4.40 (0.90)   |
| It would be better if there were no in-app display advertisements.   | 4.47 (0.87)   |
| I delete (or close) in-app display advertisements before they complete.  | 4.37 (0.91)   |

**Table 2.** Mean differences in key variables between younger and older adolescents.

|  | Younger | Older | <i>t</i> | <i>p</i> |
|--|---------|-------|----------|----------|
| Active parental mediation                                  | 2.80    | 2.22  | 7.07     | < .01    |
| Restrictive parental mediation                             | 2.95    | 2.23  | 8.94     | < .01    |
| Susceptibility to normative peer influence                 | 2.53    | 2.52  | 0.18     | .86      |
| Susceptibility to informational peer influence             | 2.72    | 2.88  | −1.99    | < .05    |
| Time spent on smartphones                                  | 3.40    | 3.79  | −4.48    | < .01    |
| Perceived smartphone skills                                | 3.69    | 4.14  | −8.28    | < .01    |
| Attitude towards in-app display advertising                | 1.72    | 1.74  | −0.24    | .81      |
| Attitude towards a personal information collection by apps | 2.72    | 2.68  | 0.54     | .59      |
| In-app display advertising avoidance                       | 4.25    | 4.41  | −2.46    | < .05    |

information collection by apps, and a tendency to avoid in-app display advertising). The results provide partial support only for restrictive parental mediation. Restrictive parental mediation was negatively associated with both attitudes towards in-app display advertising ( $\beta = -.23$ ,  $p < .05$ ) and personal information collection by apps ( $\beta = -.19$ ,  $p < .05$ ), but not with in-app display advertising avoidance ( $\beta = .07$ ,  $p = > .05$ ). None of the outcome variables were predicted by active mediation.

H2 predicted that for older adolescents, active parental mediation would result in desirable outcomes but restrictive parental mediation would not. The results, however, suggest that both types of parental mediation could lead to less desirable consumer socialization outcomes. Specifically, adolescents receiving a higher level of active parental mediation were more likely to have a favorable attitude towards personal information collection by apps ( $\beta = .20$ ,  $p < .05$ ), and those receiving a high level of restrictive parental mediation were more likely to have a positive attitude towards in-app display advertising ( $\beta = .20$ ,  $p < .05$ ). Neither active nor restrictive mediation was found to be associated with advertising avoidance. Thus, H2 was rejected.

H3 posited that adolescents' susceptibility to normative peer influence would be associated with less critical responses to app-based advertising practices. This prediction was generally supported for both young and old adolescents. Younger

**Table 3.** Multiple regression for predicting younger adolescents' responses to app-based marketer strategies ( $\beta$ ).

|  | Attitude towards in-app display advertising | Attitude towards personal information collection by apps | In-app display advertising avoidance |
|--|---|--|--------------------------------------|
| Active parental mediation                      | .09   | .08  | .15                                  |
| Restrictive parental mediation                 | -.23*                                       | -.19*  | .07                                  |
| Susceptibility to normative peer influence     | .05   | .21*   | -.24*                                |
| Susceptibility to informational peer influence | .08   | -.20*  | .00                                  |
| Time spent on smartphones                      | -.05  | .07  | .09                                  |
| Perceived smartphone skills                    | -.18*                                       | .13*   | .17*                                 |
|  | $R^2 = .07, F = 2.59, p < .05$              | $R^2 = .07, F = 2.86, p < .05$                           | $R^2 = .11, F = 4.52, p < .01$       |

\* $p < .05$ .**Table 4.** Multiple regression for predicting older adolescents' responses to app-based marketer strategies ( $\beta$ ).

|  | Attitude towards in-app display advertising | Attitude towards personal information collection by apps | In-app display advertising avoidance |
|--|---|--|--------------------------------------|
| Active parental mediation                      | -.00  | .20*   | -.01                                 |
| Restrictive parental mediation                 | .20*  | .09  | -.12                                 |
| Susceptibility to normative peer influence     | .22**                                       | .09  | .01                                  |
| Susceptibility to informational peer influence | -.13  | -.01   | -.02                                 |
| Time spent on smartphones                      | .06   | .08  | .00                                  |
| Perceived smartphone skills                    | -.02  | .15*   | .09                                  |
|  | $R^2 = .09, F = 5.36, p < .01$              | $R^2 = .09, F = 5.51, p < .01$                           | $R^2 = .03, F = 1.53, p = .17$       |

\* $p < .05$ , \*\* $p < .01$ .

adolescents' susceptibility to normative peer influence was found to result in a more favorable attitude towards personal information collection by apps ( $\beta = .21, p < .05$ ) and a lower likelihood to avoid in-app display advertising ( $\beta = -.24, p < .05$ ). For older adolescents, their susceptibility to normative peer influence led to a more favourable attitude towards in-app display advertising ( $\beta = .22, p < .01$ ).

RQ1 asked how adolescents' susceptibility to informational peer influence would be associated with their attitudinal and behavioral responses to app-based advertising practices. Among younger adolescents, susceptibility to informational peer influence was found to be negatively associated with their attitudes towards personal information collection by apps ( $\beta = -.20, p < .05$ ). However, it did not predict other outcomes. Among older adolescents, none of the outcome variables were predicted by informational peer influence.

Finally, RQ2 was posed to assess the role of media factors in adolescents' responses to mobile advertising. While the amount of time spent on smartphones was not associated with any of the outcome variables, smartphone competence was related to

some of the outcome variables for both age groups. However, the patterns of the associations differed by age. Specifically, younger adolescents' competence in smartphone use was negatively associated with their attitudes towards in-app display advertising ( $\beta = -.18, p < .05$ ) and positively associated with attitudes towards personal information collection by apps ( $\beta = .13, p < .05$ ) and in-app display advertising avoidance ( $\beta = .17, p < .05$ ). Among older adolescents, smartphone competency was positively associated with their attitudes towards apps collecting personal information ( $\beta = .15, p < .05$ ), but it was not related to other outcome variables.

## Discussion

### *Parental influence*

Our study reveals that restrictive parental mediation has a greater desired impact on younger than older adolescents. This corroborates previous research on consumer socialization and parental mediation, highlighting the notion that parents have greater influence on younger compared to older children and that younger youths are less resistant to parental authority (John 1999; Lwin, Stanaland, and Miyazaki 2008; Opgenhaffen et al. 2012).

An unexpected finding was that while restrictive parental mediation had some impact on younger adolescents' responses to app-based advertising practices, active parental mediation did not. There are two potential explanations for this finding. First, it is possible that the adolescents' view smartphone use and mobile advertising practices to be in a realm in which their parents lack authority. While active mediation has been found to be effective when parents are viewed as "authorities" in a subject domain, it may be less effective in areas where parents are not viewed as having legitimate knowledge, such as advertising (Lwin et al. 2017). Adolescents are savvy smartphone users and may perceive their competency to be higher than that of their parents, rendering the parents' explanations ineffective. Second, it is also possible that as mobile advertising is a relatively new practice, parents have yet to shape their own perspectives on it. As such, they have yet to develop credible explanations that make for effective active mediation.

Regarding older adolescents, prior studies have suggested that communication-based active mediation is more effective than control-based restrictive mediation (e.g., Youn 2008), and that restrictive parental mediation could cause boomerang effects when imposed on older adolescents (e.g. Lwin, Stanaland and Miyazaki 2008). Therefore, we predicted that active parental mediation would aid older adolescents in building a critical orientation towards mobile advertising practices, whereas restrictive mediation would not. Our results, however, indicate that not only restrictive parental mediation but also active parental mediation can result in reactance among older adolescents.

The personal nature of mobile devices may explain this study's finding. Mobile devices, especially smartphones, are by and large personally owned properties. Therefore, one's use of a mobile device is often regarded as a personal activity. Given that older adolescents in this study spend more time on smartphones and feel more confident about their smartphone skills as compared to younger adolescents (as illustrated in Table 2), older adolescents may be more attached to their personal devices and may

view parental actions as a threat to their personal freedom, even when they receive communication-based mediation.

### **Peer influence**

We examined two types of susceptibility to peer influence: normative and informational. Prior studies suggest that adolescents' susceptibility to normative peer influence results in less critical attitudes towards advertising and marketing practices (Mangleburg and Bristol 1998; Roberts, Manolis, and Tanner 2008). Our findings corroborate the results from past research, demonstrating that younger adolescents' susceptibility to normative peer influence regarding app use is positively associated with their attitudes towards the data collection practices of apps and is negatively associated with in-app display advertising avoidance. In addition, older adolescents' susceptibility to normative peer influence was found to be positively associated with their attitudes towards in-app display advertising. The overall patterns of the findings suggest that adolescents' susceptibility to normative peer influence makes them less critical about mobile advertising practices.

In comparison to normative peer influence, the role of informational peer influence is unclear in this study. Although younger adolescents' susceptibility to informational peer influence is negatively associated with their attitudes towards apps collecting personal information, this peer influence is not associated with any of the outcome variables among older adolescents. Adolescents' susceptibility to informational peer influence denotes the extent to which they rely on peers to obtain information (Mangleburg and Bristol 1998). Mangleburg and Bristol (1998) argued that the information provided by peers may help teens become more critical about advertising practices. However, it is also possible that the information friends provide to adolescents is neutral or unhelpful, making little contribution to adolescents' acquisition of persuasion knowledge. The measurement items used in this study, adapted from Mangleburg and Bristol (1998), do not assess the *types* of information that adolescents seek from their peers. Future research is encouraged to gauge the types of product information that adolescents obtain from their peers as well as the purchase context, to enhance our understanding of the role of informational peer influence.

### **Media influence**

Our findings imply that adolescents' responses to app-based advertising practices are more a function of perceived competence than of time spent on media (smartphones). We found no association between the time adolescents spent on smartphones and the outcome variables in either age group. On the other hand, perceived smartphone competency was significantly associated with some of the examined outcomes. Perceived smartphone competence is negatively associated with attitudes towards in-app displays and is positively associated with avoiding in-app display advertising among younger adolescents, suggesting that smartphone competency makes younger adolescents more critical about app-based advertising practices.



However, the results also show positive associations between perceived smartphone skills and attitudes towards personal information collection by apps for both younger and older adolescents, indicating that perceived smartphone skills have diverse impacts depending on the target segments. A possible reason behind this could be that the adolescents' view in-app display advertising and the collection of personal information by apps as two different intrusions into one's smartphone usage experience. In-app display advertising is more salient and intrusive, while data collection practices are usually covert and routine. It is possible that both younger and older adolescents who view themselves as more competent smartphone users do not perceive privacy threats when confronted with applications collecting personal information, especially since it does not intrude into their user experience. Older adolescents with more experience with the use of smartphone applications might have also gotten used to in-app display advertising, viewing it as a "necessary evil" for benefits like free apps. On the other hand, confident younger adolescents may be more impatient when advertisements intrude into their user experience, leading to more negative attitudes and greater avoidance of in-app advertisements.

### ***Implications and directions for future research***

Research examining the role of socialization agents in young people's media use has predominantly focused on parents, despite the fact that external socialization agents such as peers and media also play crucial roles in consumer socialization processes and outcomes (Shin and Lwin 2017). This study adds novel insights to the literature on consumer socialization by exploring how three key socialization agents—parents, peers, and media—influence adolescents' responses to in-app advertising practices. Given that smartphones constitute an increasingly important part of adolescents' lives, this study is timely and important.

The findings from our study suggest that different types of parental mediation result in distinct outcomes for adolescents in various developmental stages. Parents are encouraged to be more assertive in supervising younger adolescents' mobile media use, implementing control-based mediation to guide their children in coping with the mobile marketing environment. When kids reach older adolescence, however, parents should re-examine their media intervention strategies. More experienced, tech-savvy older adolescents might view parental intervention in their smartphone use as a threat to their personal freedom. They may also think that they know more about mobile media than their parents do, and thus, may not respond positively to parental mediation. To deal with this challenge, parents should find a non-threatening way to have a meaningful conversation with their older teens, demonstrating regard for their well-being rather than providing directives.

Adolescents may also be more responsive to their parents if they think that their parents are knowledgeable about mobile technologies and current marketing trends. It will be useful if media educators and policymakers consider the difficulties that parents of adolescents have and develop educational programs and guidelines that enhance the quality of family communication, as well as the parents' understanding of mobile technologies and market trends. As media literacy is inextricably tied to the strategy

of active mediation (Mendoza 2009), policymakers should promote parents' media literacy skills and knowledge, especially with regard to smartphone skills and mobile advertising.

Prior research often assumed that adolescents' interactions with peers would result in negative socialization outcomes (e.g., Nathanson 2001; Shin and Lwin 2017). However, our study recognizes that peer influence is not unidimensional and suggests that different types of peer susceptibility result in diverse socialization outcomes. Although the role of adolescents' susceptibility to informational peer influence was not clearly demonstrated in this study, it is nevertheless apparent that normative peer influence works differently from informative peer influence. Our findings showed that adolescents' susceptibility to normative peer influence could result in negative consumer outcomes in mobile advertising contexts. To promote persuasion knowledge and foster a healthy level of consumer skepticism in adolescents, parents and policymakers should find a way to help adolescents become more resistant to normative peer influence. The quality of parent-adolescent relationships, adolescents' self-esteem, and other social and psychological factors could be examined as potential factors influencing the degree to which peers are susceptible or resistant to normative peer influence. Understanding the role of peer influences in adolescents' media socialization will help key stakeholders in child education develop effective guidelines for young mobile consumers and their parents.

Finally, our study revealed important insights into the role of perceived media competency and the age of adolescents. Our findings suggest that stages of adolescent development could be a factor influencing their susceptibility to mobile marketing. For younger adolescents with lower levels of media experience, a high level of media competency could help reduce their vulnerability to salient advertising practices. However, for both younger and older adolescents, competency could also lead them to think that they are safe from dangers in the mobile media environment, to underestimate the risks associated with media use, and to be more susceptible to non-intrusive advertising and marketing practices, such as personal data collection.

The overall findings have a number of implications for advertisers. First, older adolescents view in-app advertisements as more positive and yet avoid more in-app advertisements than do younger adolescents. This means that older adolescents might be more receptive to in-app advertising that is relevant to their needs. However, their greater experience in using apps means that they are more likely to avoid in-app advertising that does not appeal to them. Marketers targeting older adolescents using in-app advertisements should carefully consider the appeal of their in-app advertising to the older adolescent market before implementing such tactics.

Our study also highlights some potential ethical issues advertisers should consider when targeting the adolescent market. Overall, our study found that parental factors are effective in fostering critical thinking about mobile-based advertising only among younger adolescents. While marketers might see this as a potential area where they can target older adolescents without parents meddling with their efforts, we suggest that the findings call for more responsibility from advertisers targeting older adolescents. Crucially, as older adolescents think of themselves as more competent, they may feel "safe" from unwanted influences through their smartphones. Because older adolescents are unlikely to be successfully influenced by their parents to think critically

about mobile advertising, advertisers have greater responsibility to ensure that advertising targeting those users consists of content that is suitable for their age group. This is especially important since previous research has shown that advertisers generally feel that children above the age of 12 are capable of fully understanding non-traditional advertising formats such as in-app advertising, and thus feel ethically justified employing such approaches with what amounts to a very young adolescent audience (Daems, De Pelsmacker, and Moons 2019). While an advertiser's main goal is to sell, doing so ethically without imparting unintended effects on the psyche of youths should represent an ideal to which they strive.

Our study also creates new opportunities for future research. First, although it examined multiple types of socialization agents, future studies could examine a wider range still, including school education and media intervention programs. Second, this study was conducted in a single country. Singapore is a developed country with a high mobile penetration rate, but the findings may be less applicable to countries with lower mobile penetration rates among adolescents. Future studies conducted in different countries and contexts will enhance our understanding of the role of socialization agents in young consumers' responses to new forms of advertising and marketing strategies. Third, this study relied only on adolescents' self-reports of parental mediation practices. Thus, the findings relating to parental mediation reflect "perceived" parental mediation practices rather than what parents actually do. In future research, dyad research involving both parents and adolescents is strongly encouraged to garner a more comprehensive understanding of parental mediation and its impacts on youth. Similarly, our measure of smartphone competency assessed "perceived" skills. Future research might build on this study by assessing actual smartphone skills using objective tests or specific scenarios.

Further, this study only examined socialization agents' influence on attitudinal and behavioral outcomes towards in-app advertising, without examining the potential mediators that lead to those outcomes. We conceived of the attitudinal and behavioral responses as critical responses, highlighting these responses as a reflection of greater critical thinking regarding in-app advertising. Future research therefore ought to examine if this assumption is supported, by testing whether cognitive mediators that reflect critical thinking, such as persuasion knowledge (Friestad and Wright 1994) and regulatory focus (Higgins 1997; Zarouali et al. 2019), mediate the effects we found.

Finally, this study focused on adolescents' interactions with socialization agents. Future research is encouraged to examine various social and psychological determinants of the quality and frequency of those interactions, such as parent-child relationships and communication patterns, socioeconomic status, and culture, as these factors may shed additional light on adolescents' relationship with mobile advertising.

## Note

1. Secondary schools consist of four levels – from age 12 in secondary one to age 17 in secondary five – while polytechnics consists of three levels – from age 16 in year one to age 19 in year three.

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