



UvA-DARE (Digital Academic Repository)

Adolescents' advertising literacy and privacy protection strategies in the context of targeted advertising on social networking sites: Implications for regulation

Zarouali, B.; Verdoodt, V.; Walrave, M.; Poels, K.; Ponnet, K.; Lievens, E.

DOI

[10.1108/YC-04-2020-1122](https://doi.org/10.1108/YC-04-2020-1122)

Publication date

2020

Document Version

Final published version

Published in

Young Consumers

License

Article 25fa Dutch Copyright Act

[Link to publication](#)

Citation for published version (APA):

Zarouali, B., Verdoodt, V., Walrave, M., Poels, K., Ponnet, K., & Lievens, E. (2020). Adolescents' advertising literacy and privacy protection strategies in the context of targeted advertising on social networking sites: Implications for regulation. *Young Consumers*, 21(3), 351-367. <https://doi.org/10.1108/YC-04-2020-1122>

General rights

It is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), other than for strictly personal, individual use, unless the work is under an open content license (like Creative Commons).

Disclaimer/Complaints regulations

If you believe that digital publication of certain material infringes any of your rights or (privacy) interests, please let the Library know, stating your reasons. In case of a legitimate complaint, the Library will make the material inaccessible and/or remove it from the website. Please Ask the Library: <https://uba.uva.nl/en/contact>, or a letter to: Library of the University of Amsterdam, Secretariat, Singel 425, 1012 WP Amsterdam, The Netherlands. You will be contacted as soon as possible.

UvA-DARE is a service provided by the library of the University of Amsterdam (<https://dare.uva.nl>)

Adolescents' advertising literacy and privacy protection strategies in the context of targeted advertising on social networking sites: implications for regulation

Brahim Zarouali, Valerie Verdoodt, Michel Walrave, Karolien Poels, Koen Ponnet and Eva Lievens

Abstract

Purpose – This study aims to investigate the development of adolescents' advertising literacy and privacy protection strategies in the context of targeted advertisements on social networking sites (SNSs).

Design/methodology/approach – A survey was conducted among 374 adolescents between 12 and 17 years of age, and 469 young adults (18–25 years) served as a comparative benchmark.

Findings – Results indicate that advertising literacy increases progressively throughout adolescence, and reaches adult-like levels only by the age of 16. In addition, adolescents have an inadequate awareness of commercial data collection practices. This awareness slowly increases as a function of their age until it reaches an adult level around the age of 20. Finally, findings reveal that adolescents take little action to cope with targeted advertisements by means of privacy protection strategies.

Practical implications – This paper devotes much attention to the formulation of specific recommendations for EU policymakers and regulatory bodies. In addition, it also holds implications for advertisers (e.g. the need for more in-depth data protection impact assessments), social media providers (e.g. adolescent-friendly privacy policy) and social caretakers (e.g. achieving advertising literacy and privacy education).

Originality/value – This paper fulfills the need to investigate adolescents' advertising literacy and privacy-protective behaviors on SNSs, and, in turn, directly translates these insights into recommendations that can underpin the rationale of regulatory or policy decisions on a European level.

Keywords Adolescence, Regulation, Social networking sites, Privacy protection, Advertising literacy

Paper type Research paper

Brahim Zarouali is based at the Amsterdam School of Communication Research (ASCoR), University of Amsterdam, The Netherlands.

Valerie Verdoodt is based at the Department of Law, London School of Economics and Political Science, London, UK.

Michel Walrave and Karolien Poels are both based at the Department of Communication Studies, University of Antwerp, Antwerp, Belgium.

Koen Ponnet (imec-mict) and Eva Lievens (Law and Technology) are both based at Ghent University, Ghent, Belgium.

Introduction

Growing up in the digital era, adolescents have embraced social networking sites (SNSs) as an integral part of their daily lives. The pervasiveness and increased popularity of SNSs among adolescents has also drawn the attention of advertisers, offering them an important venue for their commercial agendas. On these platforms, adolescents are regularly confronted with targeted advertising that is tailored to their personal characteristics and behavior (Zarouali *et al.*, 2017, 2018). The tracking, profiling and targeting practices that enable personalization are sophisticated and opaque, and as such, can inhibit adolescents' ability to understand these commercial practices or make critical decisions about their privacy and personal data (Verdoodt and Lievens, 2017). A study revealed indications that

Received 5 April 2020
Revised 20 May 2020
Accepted 17 June 2020

Funding: This work was funded by the Agentschap Innoveren en Ondernemen (Flanders Innovation & Entrepreneurship Agency) under Grant SBO-130008.

adolescents might not be fully aware of brand communications that circulate in a social networking environment (Rowley *et al.*, 2016). Recently, this issue has been the subject of heightened public debate and raised important concerns from a children's rights perspective, particularly for their rights to privacy and protection against exploitation under the UN Convention on the Rights of the Child (UNCRC) (Verdoodt and Lievens, 2017). Therefore, we aim to empirically investigate whether adolescents understand advertising on SNSs (i.e. their advertising literacy) and determine to which extent they engage in protective behaviors to safeguard their privacy, and, in turn, *directly* translate these insights into recommendations that can underpin the rationale of regulatory or policy decisions at European level (European Commission, 2010; Verdoodt and Lievens, 2017).

Based on the aforementioned, our research aim is threefold. First, we explore at what age advertising literacy among adolescents' (12–17 years) is fully developed in the context of targeted advertising on SNSs, with young adults being the benchmark (18–25 years). This comparison will allow for meaningful interpretation of the progression of adolescents' advertising literacy, and thus, determine when this knowledge crystallizes into a sophisticated defense mechanism. Second, by using the same comparative base, we aim to explore whether adolescents have an adequate awareness of data collection practices (i.e. being aware of the type of data being used for advertising purposes). Third, we examine adolescents' privacy conceptions and institutional privacy protection strategies on SNSs (as compared to young adults). This allows us to explore patterns of privacy awareness and privacy management from a targeted advertising perspective. With the obtained findings, we devote considerable discussion on how these findings can directly feed into recommendations for EU policymakers and regulatory bodies (e.g. GDPR and ePrivacy Directive).

Background: the regulatory framework for targeted advertising

At the EU level, the collection and processing of children's data for targeted advertising practices are covered by the general data protection regulation (GDPR) (European Parliament and Council, 2016). The GDPR applies to (most often fully or partially automated) processing of personal data (Article 2 GDPR). The GDPR already pays particular attention to "children" and acknowledges that they merit specific protection regarding their personal data, as they are less aware of the risks and the consequences of the processing of their personal data on their rights (Recital 38 GDPR). This specific protection for children should be awarded when their personal data is processed in the context of marketing and profiling (Recital 38 GDPR). Advertisers that want to process children's personal data for the delivery of personalized advertising will have to comply with the principles and requirements for data controllers and the specific protection for children in the GDPR (Verdoodt and Lievens, 2017; Zuiderveen Borgesius, 2015). In addition, the ePrivacy Directive contains rules for the processing of personal data in the electronic communication sector, which already covers popular tracking technologies used for the serving of targeted advertisements like cookies. As such, it forms an additional layer of protection, complementing the GDPR. In January 2017, the European Commission launched its proposal for an ePrivacy Regulation, which is set to replace the ePrivacy Directive and align the rules for electronic communications with the new standards of the GDPR. At the moment, it is still unclear what the real impact of these changes on the daily lives of children and the exercise of their rights will be (Lievens and Verdoodt, 2017). In this regard, research on adolescents' understanding of the personalization and data collection elements, as well as the uptake of privacy protection strategies are highly relevant to develop evidence-based recommendations regarding the finalization and implementation of the ePrivacy Regulation.

Literature review

Advertising literacy

Advertising literacy refers to the necessary skills and abilities to recognize, interpret and critically evaluate advertising (Hudders *et al.*, 2017). More frequently than not, the concept of advertising literacy has been used to infer an individual's understanding of the *selling* and *persuasive* intent of advertising. For decades, scholars have argued that by the age of 12, children have reached a robust level of advertising literacy for traditional advertising forms (Gunter *et al.*, 2005; Gunter and Furnham, 1998; Valkenburg and Cantor, 2001). Recently, however, studies have countered this claim by showing that advertising literacy has not entirely matured at the age of 12, indicating that it continues to develop through adolescence as well (Carter *et al.*, 2011; Rozendaal *et al.*, 2010). Given this empirical evidence, it is somewhat remarkable to observe that no research efforts have been directed to the development of advertising literacy past the age of 12. This issue is now more relevant than ever as adolescents are daily exposed to covert and embedded advertising formats during their – extensive-time on SNSs (i.e. sponsored posts or targeted ads). To elaborate on this issue, it is essential to address that advertising literacy depends on two major elements:

1. cognitive and information processing ability and
2. experience (Friestad and Wright, 1994).

When it comes to cognitive and information processing ability, it has been asserted that covert and embedded ads require a greater amount of mental resources to successfully process the persuasive and selling intent of these persuasive messages (Hudders *et al.*, 2017; Panic *et al.*, 2013). On SNSs, targeted ads adopt the format of the network, and are subtly integrated into the user news feed in between other, organic posts (Aguirre *et al.*, 2016). This practice blurs the boundaries between advertising, entertainment and information, making it more challenging for adolescents to understand these messages as pieces of marketing content (Hudders *et al.*, 2017). Therefore, we argue that advertising literacy in the context of targeted advertisements on SNSs needs sufficient time to develop, which should be a process that continues during adolescence as well.

A second requirement for advertising literacy development is the experience or practice individuals have with advertisements, which can simply be defined as the number of exposures to a specific ad format (Evans and Park, 2015; Friestad and Wright, 1994). As argued by Friestad and Wright (1994), experience and practice with certain types of persuasion attempts may only begin beyond a consumer's childhood. In contrast to traditional advertising (to which children are exposed to from a very young age), consumers might start to gain experience with targeted ads on SNSs during their adolescent years, as the terms of service of most SNSs usually restrict their use to those 13 or older years of age. Although it should be acknowledged that children may already have a profile account before the age of 13 (Livingstone *et al.*, 2013; Ofcom, 2017), we can still argue that experience-based development of advertising literacy in an SNSs context is most likely to occur well beyond the childhood years, and thus develop throughout adolescence.

Based on this reasoning, we expect adolescents' advertising literacy to increase as a function of their age during adolescence. However, the question still remains when adolescents reach an adult-like level of advertising literacy (i.e. a fully developed or matured advertising literacy). Therefore, we formulate:

H1. Advertising literacy in the context of targeted advertising on SNSs gradually increases during adolescence.

RQ1. At what age do adolescents reach adult levels of advertising literacy in the context of targeted advertising on SNSs?

Awareness of data collection and use

In addition to advertising literacy, adolescents need a wider array of advertising competencies to fully comprehend how targeted advertisements work and intend to persuade people. In this respect, it is essential to know that social platforms have compiled an unprecedented database of personal information about their users, which companies and third parties can easily use to tailor advertising at specific, predefined target groups who are most likely to be interested in a particular product or service (Knoll, 2016; Tucker, 2014). Advertisers can select their audience based on innumerable pieces of personal data such as socio-demographic information, preferences and interests, lifestyle pattern, real-time location, visited websites, etc. Therefore, being aware of the acquisition and usage of one's personal data by companies and brands is crucial to have an accurate and thorough understanding of targeted advertising on SNSs, as well as to trigger critical reflection with regard to the consequences of these marketing practices for their online privacy.

Tracking and profiling of consumers' online information and activities often happen covertly on SNSs (Boerman *et al.*, 2017). Research showed that users' usually know that data collection and usage is somehow involved, but have insufficient knowledge on how and which data are being used by companies and third parties (McDonald and Cranor, 2010; Smit *et al.*, 2014). Thus, even if adolescents were to have sufficient advertising literacy (i.e. understanding that targeted ads aim to sell and persuade), it does not necessarily follow that they also understand the underlying data acquisition and usage due to a general lack of transparency (Lievens and Verdoodt, 2017; Zarouali *et al.*, 2017). A recent study by De Pauw *et al.* (2017) illustrates this line of reasoning: although the children in their study were able to recognize a personalized advertisement, few of them were aware that the advertisement was based on their own personal data, i.e. their previous browsing behavior. In the context of this study, we expect that this awareness will increase as adolescents become older. In addition, we also aim to explore when this awareness reaches an adult-like level. Hence, we formulate the following hypothesis and research question:

H2. Awareness of data collection and use on SNSs for advertising purposes gradually increases during adolescence.

RQ2. At what age do adolescents reach adult levels of awareness of data collection and usage on SNSs for advertising purposes?

Institutional privacy protection strategies and concerns

From the moment SNSs gained considerable popularity around the globe, the topic of online privacy attracted the attention of academic research from the angle of commercial exploitation by companies and third parties (Debatin *et al.*, 2009; Livingstone *et al.*, 2013). Although this issue concerns all users on SNSs, it is particularly important in the case of adolescents. When it comes to online privacy on SNSs, it has been argued that adolescents engage in loose and *laissez-faire* behavior, hereby sometimes ignoring the risk of privacy invasions (Trepte and Reinecke, 2011; Youn, 2009). In this context, scholars often refer to what has been called the *privacy paradox* (Barnes, 2006; Norberg *et al.*, 2007; Taddicken, 2014). This paradox asserts that adolescents in general consider their online privacy to be important, yet they do not act accordingly to protect it in specific situations (Barnes, 2006). Indeed, studies have revealed that adolescents are less eager to engage in privacy-protective behavior than older age groups, as they disclose much more personal information and are less likely to use privacy settings as compared to adult users (Christofides *et al.*, 2009; Walrave *et al.*, 2012).

However, it is important to note that this line of reasoning mainly applies to adolescents' protective strategies toward their *social privacy* on SNSs. This refers to protective measures to control access to their personal data by other users, rather than the SNS provider or third parties (like advertisers). Considering the intrusiveness and ubiquity of targeted advertising

in SNSs, it is crucial to also determine to what extent adolescents engage in *institutional* privacy-protective behavior, which refers to protection strategies to control and cope with the use of personal data by companies and third parties for advertising purposes (Raynes-Goldie, 2010; Young and Quan-Haase, 2013). To date, it remains somewhat unclear whether adolescents are truly concerned about their institutional privacy in the context of advertising on SNSs, and, to what extent they engage in institutional privacy protection strategies as a control and coping mechanism. In this regard, Boyd (2014) argued that adolescents might not be concerned about commercial or organizational actors having access to their personal information; online privacy for them rather means avoiding surveillance from parents, teachers, friends and other meaningful persons in their lives. This can be explained by referring to adolescents' imagined audiences on a SNS: whereas friends, peers, family and other members of their network represent "known audiences" (i.e. social privacy), advertisers and commercial parties are usually "unknown audiences" (i.e. institutional privacy) (Debatin *et al.*, 2009; Trepte and Reinecke, 2011; Young and Quan-Haase, 2013). In other words, the information gathering practices for purposes of targeted advertising might remain invisible on social platforms, and thus, out of reach of adolescents' privacy concerns (Debatin *et al.*, 2009).

Based on this discussion, we highlight the urgent need to clarify adolescents' privacy concerns vis-à-vis advertisers on SNSs (i.e. institutional privacy), with adults being the comparative base; and more importantly, explore to what extent they engage in institutional privacy-protecting strategies to cope with advertisements based on their personal data. With adolescents' well-being, e-safety and fundamental rights at stake (such as their rights to privacy and development) (Verdoodt and Lievens, 2017), we formulate the following research questions:

- RQ3. To what extent are adolescents concerned about their institutional privacy, and how does this compare to adults?
- RQ4a. Does engaging in institutional privacy protection strategies increase during adolescence?
- RQ4b. At what age do adolescents reach adult levels of institutional privacy protection strategies on SNSs?

Methods

Participants and procedure

The adolescent sample consisted of 374 respondents between 12 and 17 years of age ($n_{12\text{year}} = 60$; $n_{13\text{year}} = 70$; $n_{14\text{year}} = 56$; $n_{15\text{year}} = 68$; $n_{16\text{year}} = 63$; $n_{17\text{year}} = 57$) ($M_{\text{age}} = 14.47$, $SD = 1.69$; 53% girls) who met the criterion of being active on SNSs. We decided to include 12-year-olds as well because solid and reliable evidence exists that significant numbers of children younger than 13 have a profile on a SNS, even though the minimum age is set to 13 (Lilley and Ball, 2013; Ofcom, 2017). All adolescents in the sample were recruited from schools situated in Belgium by means of convenience sampling. More precisely, based on personal contacts, we contacted two secondary schools to ask them whether they were willing to participate in the study and both accepted. Prior to the study, formal consent from the school's principal, parental consent and adolescents' informed consent was obtained. The study's procedure was approved by the ethical committee of our institution (ethical approval number: SHW_17_37). The paper-and-pencil questionnaire was conducted in classrooms during school time. All respondents were assured that their responses would be treated anonymous and confidential and that they could withdraw their participation at any given time without negative consequences. No respondent decided to do so. Importantly, given the focus on adolescents' understanding of targeted ads, we decided to offer them a visual aid to make the questions more concrete. They were given two examples of real targeted ads or sponsored posts that appear in the news feed of two popular SNSs,

Facebook and Instagram. These stimuli helped the adolescents to comprehend what kind of ads we were referring to. This is important to ensure that they answer all the survey questions while thinking of the right type of ads (which contributes to the validity of the results).

Regarding the adult subsample, a total of 469 respondents 18–25 years of age participated in the study ($n_{18\text{year}} = 40$; $n_{19\text{year}} = 76$; $n_{20\text{year}} = 63$; $n_{21\text{year}} = 81$; $n_{22\text{year}} = 60$; $n_{23\text{year}} = 30$; $n_{24\text{year}} = 69$; $n_{25\text{year}} = 50$) ($M_{\text{age}} = 21.41$, $SD = 2.19$; 52% female). These young adults were recruited by university students within their own community environment. Most had a higher education level (69%), around one third had a higher secondary education level (28%) and 1% had a low secondary or lower education level. The majority of the respondents were students (73%), 22% had a full-time position, 2% had a part-time position and 2% were unused at that point in time. As argued by [Rozendaal et al. \(2010\)](#), young adults represent an accurate benchmark in advertising research because of two reasons:

1. They have grown up in a – more or less-similar digital and commercial media environment as today's adolescents.
2. They are expected to have a “mature” level of advertising literacy, making them highly suitable for direct comparisons.

The young adults received the exact same survey as the adolescents (including the same visuals).

Measures

Advertising literacy was operationalized as an understanding of the selling and persuasive intent of a sponsored post on an SNS. To measure this construct, we used the recently developed scale ([Boerman et al., 2018](#)) consisting of six items. A sample item is “the reason that sponsored posts are shown on SNSs is to encourage people to buy the advertised brand”). The response options ranged from 1 (*strongly disagree*) to 7 (*strongly agree*). The scale was found to be reliable ($\alpha_{\text{adolescents}} = 0.93$; $\alpha_{\text{adults}} = 0.78$). All items were aggregated to form a single measure for advertising literacy ($M_{\text{adolescents}} = 5.05$, $SD_{\text{adolescents}} = 1.49$; $M_{\text{adults}} = 6.06$, $SD_{\text{adults}} = 0.67$)

To measure awareness of data collection and use, we asked participants whether they were aware of what type of data SNSs collect for brands to use for targeting sponsored posts. Six options were presented:

1. personal information (e.g. age, gender, residence, etc.);
2. preferences and interests (e.g. liked pages);
3. behavior on SNSs (e.g. wall posts, shared pictures, comments, etc.);
4. real-time location (e.g. via location services on a smartphone);
5. Social contacts (e.g. friends list, chat messages from Facebook Messenger, etc.); and
6. behavior outside the network (e.g. visited websites via Google, apps used, etc.).

The answer options were *yes*, *no* or *don't know*. As commercial actors can easily use all of these data, all six options were true. The answers will be analyzed separately and aggregated to form a single measure. In this respect, the answer *yes* was coded 1 and *no* or *don't know* were coded 0. The total score served as the value for adolescents' awareness of data collection and usage for advertising purposes ($M_{\text{adolescents}} = 2.35$; $SD_{\text{adolescents}} = 1.73$; $M_{\text{adults}} = 4.09$, $SD_{\text{adults}} = 1.75$).

Based on the study conducted by [Young and Quan-Haase \(2013\)](#), we measured institutional privacy protection strategies by asking respondents about eight strategies they

used to control and cope with their personal data being used by advertisers for commercial purposes (e.g. “I restrict my personal information to SNSs to prevent advertisers from obtaining it”). Respondents were asked to rate these strategies on a seven-point Likert scale, with response options ranging from one (*strongly disagree*) to seven (*strongly agree*) (for all the items, [Figure 3](#)). Similar to the previous concept, the strategies will be analyzed separately and averaged to create a single measure of the extent to which adolescents engage in overall institutional privacy protection behavior on SNSs ($M_{adolescents} = 3.60$; $SD_{adolescents} = 1.09$; $M_{adults} = 3.47$, $SD_{adults} = 1.08$)

We used the six-item Global Information Privacy Concern scale ([Malhotra et al., 2004](#)), and made slight adaptations to measure respondents’ privacy concerns in the context of advertising on SNSs (i.e. institutional privacy concerns). The response categories ranged from one (*strongly disagree*) to seven (*strongly agree*). A sample item is “to me, the most important thing is to keep my privacy intact from online brands on SNSs.” Initially, the scale’s reliability was 0.69 for the adolescent subsample, and 0.54 for the adult subsample. Therefore, we omitted the fourth item to improve the scale’s reliability ($\alpha_{adolescents} = 0.78$; $\alpha_{adults} = 0.78$). The mean score of the remaining five items was used as a measurement of institutional privacy concern ($M_{adolescents} = 5.77$, $SD_{adolescents} = 0.98$; $M_{adults} = 5.41$, $SD_{adults} = 1.03$).

Finally, we also included control variables in our survey (e.g. gender, time spent on SNSs and education). However, analyses showed that none of these covariates was related to our dependent variables. Two explanations can be given here:

1. in regard to time spent on SNSs, there was a ceiling effect (all adolescents scored very high on this variable and – most likely–because of this saturation, it was not significantly related to any of the dependent variables); and
2. for education, we only selected two schools (with both schools having similar educational tracks), so the level of differentiation in “educational degree” was very limited in the sample.

As such, we decided to exclude these variables from further analysis.

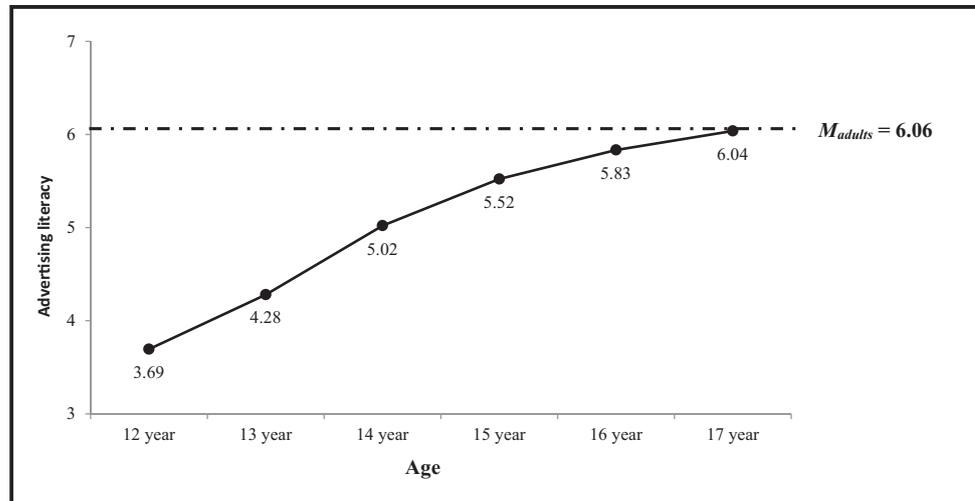
Results

Advertising literacy

We first conducted an analysis of variance (ANOVA) to investigate differences in advertising literacy during the adolescent years. A significant association was found between age and advertising literacy ($F(5, 365) = 33.47$, $p < 0.001$). To elaborate on this result, we visualized the development of advertising literacy in [Figure 1](#). As can be seen in this depiction, advertising literacy gradually increases from the age of 12 until it seems to level off around the age of 15–16. Post hoc LSD tests confirmed that advertising literacy increased significantly until the age of 16 ($M = 5.83$, $SE = 0.12$) ([Table 1](#)). From then on, no significant increase in advertising literacy can be witnessed. When it comes to adults, age was not positively related to advertising literacy ($F(7, 461) = 0.89$, $p = 0.52$). The mean advertising literacy score among adults was 6.06 (and thus, representing the adult benchmark). As shown in [Table 1](#), post hoc analyses reveal that only by the age of 16, adolescents possess an advertising literacy level that does not differ significantly from adults ($M_{16year} = 5.83$ vs $M_{adults} = 6.06$, $p = 0.08$). Therefore, we conclude that advertising literacy toward targeted advertising on SNS reaches adult-like levels around the age of 16.

Data collection awareness

To explore the association between the age and data collection awareness, Pearson’s chi-square tests were used. Results revealed that five out of six options were positively related to adolescents’ age. These targeting options are: personal information ($\chi^2(10) = 30.86$, $p < 0.001$);

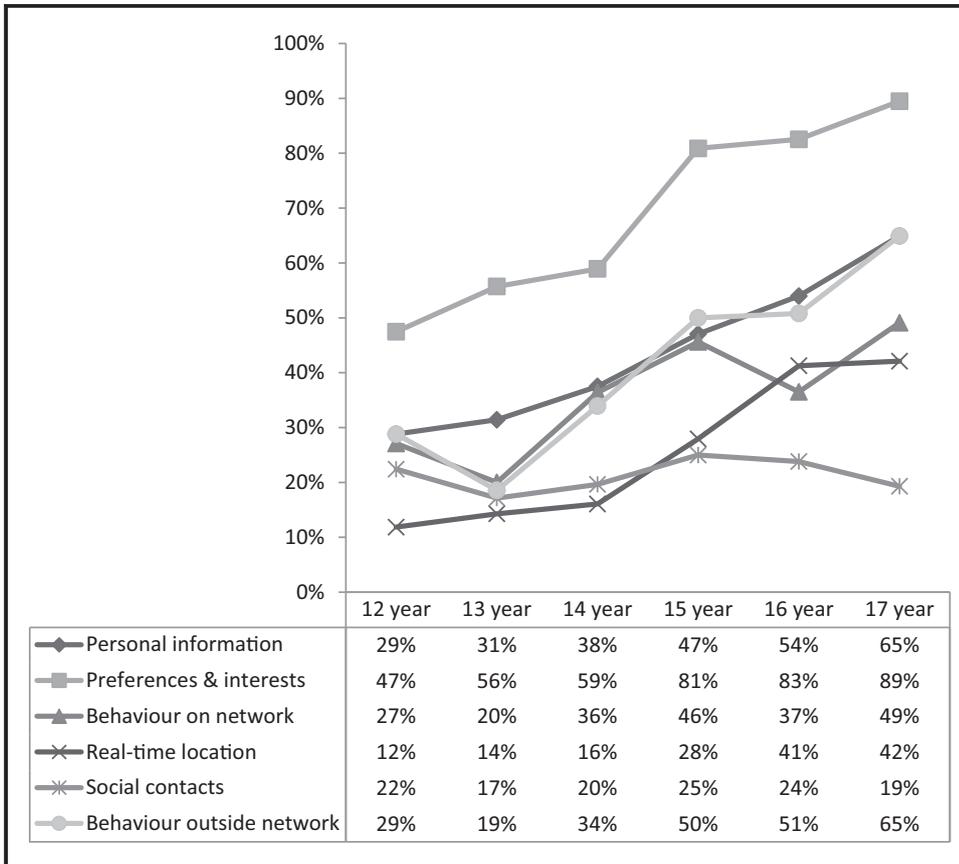
Figure 1 Development of advertising literacy throughout adolescence**Table 1** Means, standard errors and post hoc comparisons using LSD

Age	Advertising literacy		Data collection		Privacy protection	
	M	SE	M	SE	M	SE
<i>Adolescents</i>						
12 year	3.69 ^a	0.12	1.63 ^a	0.22	3.24 ^a	0.14
13 Year	4.28 ^b	0.12	1.57 ^{a,b}	0.20	3.29 ^a	0.13
14 Year	5.02 ^c	0.13	2.02 ^{a,b}	0.23	3.95 ^b	0.15
15 Year	5.52 ^d	0.12	2.77 ^c	0.21	3.81 ^{b,c}	0.13
16 Year	5.83 ^{d,e}	0.12	2.89 ^{c,d}	0.21	3.50 ^{a,c}	0.14
17 Year	6.04 ^{e,f}	0.13	3.30 ^d	0.22	3.86 ^{b,c}	0.14
Adults	6.06 ^{e,f}	0.04	4.09 ^e	0.08	3.47 ^a	0.05

Notes: Means with different superscript differ significantly at least at $p < 0.05$

preferences and interests ($\chi^2(10) = 45.53, p < 0.001$); behavior on network ($\chi^2(10) = 18.11, p < 0.05$); real-time location ($\chi^2(10) = 34.24, p < 0.001$); behavior outside network ($\chi^2(10) = 42.60, p < 0.001$). For social contacts, no significant association was found with age ($\chi^2(10) = 7.54, p = 0.67$). To visualize this, we included Figure 2, which shows the proportion – in percentages – of adolescents that were aware (i.e. answered “yes”) of the types of data being collected and used. This clearly illustrates not only the five abovementioned (gradual) increases but also shows an alarming overall pattern of poor data collection awareness among adolescents (and particularly the younger ones). To explore the age at which adolescents reach adult-like awareness, we combined the six items (i.e. the six options) into one instrument (and took the means score – see measures section). Interestingly, LSD post hoc output in Table 1 demonstrates that even by the age of 17, adolescents have not yet reached a mature level of data collection awareness ($M_{17\text{year}} = 3.30$ vs $M_{adults} = 4.09, p < 0.001$). Further examination indeed showed that this awareness continued to develop during young adulthood as well, as age accounted for a significant variation in data collection awareness among adults as well ($F(7, 461) = 2.17, p < 0.05$). Only by the age of 20 did this knowledge stagnate, with no further significant increases ($M_{20\text{year}} = 5.08, SD = 0.21$).

Figure 2 Proportion of adolescents being aware of data collection and use

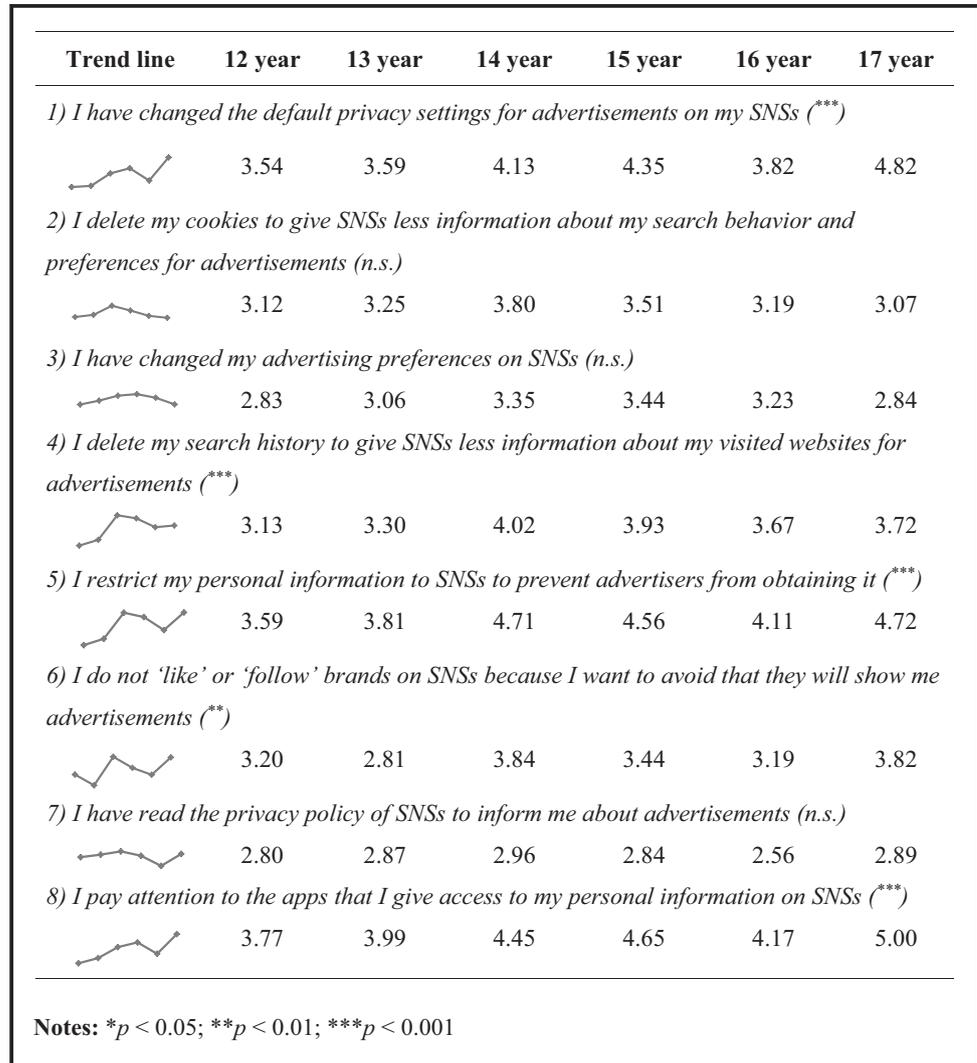


Institutional privacy protection

Figure 3 presents all the privacy protection strategies in relation to adolescents' age, along with a test of significance (*F*-tests). A general trend can be identified for five out of eight privacy protection strategies (1, 4, 5, 6 and 8): young adolescents (12–13 years) have low scores for protecting and coping with their institutional privacy, but they gradually tend to engage in more strategies as they enter late adolescence. Nevertheless, it can be concluded that even by the age of 17, the overall scores of these five privacy protection strategies are relatively low. For the three remaining options, i.e. reading the privacy policy, changing advertising settings and deleting cookies, the increase in adolescents' age had no significant influence in engaging in these three privacy protection strategies.

To avoid a lengthy account of all the different protection strategies and their respective relationships, we used adolescents' aggregated scores on privacy protection strategies to answer our research questions. First, an ANOVA revealed a significant association between age and adolescents' aggregated institutional privacy protection behavior ($F(5, 359) = 5.033, p < 0.001$), which confirms the trends visualized in Figure 3. Although significant, we must again emphasize that the "age-related improvements" are limited, with 17-year old adolescents presenting a mean score of only 3.86 out of 7. When it comes to adults, age was not significantly related to institutional privacy behavior ($F(7, 461) = 1.09, p = 0.37$), with a mean score of 3.47 on a scale of 7. Surprisingly, in answering the research question

Figure 3 Age differences in privacy-protecting strategies during adolescence



that requires the comparison between adolescents and adults in terms of privacy-protective behavior, analyzes showed that adults were not more likely to engage in privacy-protective behavior. On the contrary, as Table 1 delineates, pairwise comparisons with LSD show that adolescents have rather similar scores to adults before the age of 14 (i.e. statistically not different), but from then on, they score significantly higher on privacy protection strategies than adults (except for the age of 16). All in all, the mean scores for adolescents remain relatively low, which also holds true for adults.

Finally, analyzes also indicated that age was not significantly associated with adolescents' institutional privacy concerns ($F(5, 362) = 1.73, p = 0.13$). This indicates that institutional privacy concern is a – more or less – stable construct throughout adolescence. Interestingly, an additional ANOVA revealed that adolescents were even more concerned about their institutional privacy concerns than adults ($M_{adolescents} = 5.77$ vs $M_{adults} = 5.41, p < 0.001$). This will be further elaborated in the discussion (Figure 3).

General discussion

In the present study, we contribute to a deeper understanding of the development of advertising literacy during the adolescent years (12–17 years) for targeted advertisements on SNSs (also called “sponsored posts”). These ads take the form of a regular SNS post and are well-embedded in the overall layout of a social network (i.e. on a user’s news feed in between other seemingly similar organic posts). In addition, we shed light on data collection awareness and institutional privacy management during this period as well. In all this, young adults (18–25 years) were set as the empirical benchmark. The research is timely because recent regulatory frameworks are open for significant reforms (e.g. GDPR, ePrivacy Regulation), and the results could, therefore, feed into valuable recommendations for policymakers.

First, the data showed a developmental progression in adolescents’ advertising literacy (i.e. the understanding of the selling and persuasive intent) in the context of targeted ads on SNSs. We found that advertising literacy was limited around the age of 12. Past this age, it gradually increased until it seemed to level off around the age of 16, reaching sophisticated adult-like levels. This result puts the general conception that advertising literacy is acquired between the ages of 8 to 12 into perspective. The assertion is mainly based on studies conducted with traditional advertising (i.e. television commercials) (Rozendaal *et al.*, 2010; Valkenburg and Cantor, 2001). Our study challenges and extends previous research by showing that for advertising on an SNS, advertising literacy continues to develop well beyond the childhood years and might only be considered a fully developed, sophisticated and robust defense mechanism around the age of 16 in a commercialized social media landscape. Adolescents may be very familiar with social media, but this does not necessarily transfer into being “ad literate” on these platforms.

Although our data showed that adolescents have an adult level advertising literacy by the age of 16, the collection and use of personal data to personalize these ads were mostly operating “under the radar” of adolescents’ consciousness. This awareness eventually matured only by the age of 20. That being said, it must be addressed that even at this point, respondents were not entirely capable to determine which pieces of information companies and third-parties can use. Thus, adolescents are not sufficiently aware of how data are being collected, aggregated and eventually used to target them with personalized ads. This covertness of data collection, profiling and targeting practices could make it very difficult for adolescents to make well-informed consumer decisions, as well as engage in critical online privacy assessments.

Finally, our study also revealed empirical indications of adolescents not adequately engaging in *institutional privacy* protection strategies, i.e. strategies to control and cope with the use of personal data by companies and third parties for advertising purposes (see Table 2 for an overview of these strategies). Although older adolescents engaged more often in these strategies than young adults, their overall level of protection only scratched the surface of what can be deemed responsible for privacy-protective behavior on SNSs (particularly among the younger ones). However, poor institutional privacy protection is not necessarily an indication of not caring or not being concerned. Our results also showed that adolescents were actually concerned about the collection and usage of their personal data on SNSs, hereby perceiving advertisers as an immediate privacy concern. Thus, an interesting contradiction emerges between adolescents being concerned about their institutional privacy on the one hand; but on the other, exhibit lax institutional privacy-protective behavior. This empirical inconsistency confirms the *privacy paradox* (Barnes, 2006; Norberg *et al.*, 2007). Adolescents’ privacy concerns are not translated into privacy-protective behavior on SNSs. Recommendations on this issue will be discussed below (cfr. practical implications).

Implications for regulation

General data protection regulation

Considering the overall low levels of advertising literacy and data collection awareness during adolescence in this study, we argue that adolescents also deserve specific protection when it comes to targeted advertising on SNS. This group of youngsters is fully awarded the right to privacy and to protection from exploitation by the UNCRC. Therefore, it is essential that legislators carefully balance any decision in this context and adopt (age-based) measures that recognize the reality of adolescents' low advertising competences. In this regard, however, choosing a high age threshold in the context of Article 8 of the GDPR (Article 8 requires parental consent for all children under 16 years old when information society services are offered directly to them, but the Member States can lower this age threshold to 13 years) will not necessarily provide better protection for youth. More specifically, a high age threshold places too much responsibility in the hands of parents, who might not be familiar with the digital environment themselves and lack knowledge or skills to make an informed decision or who are simply not interested (Lievens and Verdoodt, 2017). As such, we recommend Member States of the EU to adopt a lower age threshold for consent combined with additional specific protection measures (see below) for all children under 18 years when it comes to the processing of their personal data in the context of (targeted) advertising.

Draft ePrivacy regulation

The draft ePrivacy Regulation brings about important changes for the players involved in targeted advertising (Boerman *et al.*, 2017). Yet, whereas the GDPR explicitly recognizes children as a vulnerable group of individuals that deserve specific protection when it comes to the processing of their personal data, especially in the context of profiling and marketing, the original proposal for an ePrivacy Regulation by the European Commission contained no references to children at all. In the latest amendments proposed by the Council, children are mentioned in the context of the "legitimate interests" as a potential ground for legitimizing the processing of metadata or the placement of cookies on end-users' devices (Articles 6b and 8 Council amendments of March 6, 2020). More specifically, this ground cannot be used by data controllers who process electronic communications data of children or who place cookies on children's devices, and as such, will have to continue to obtain (parental) consent. Apart from this addition and a new provision to combat child sexual abuse, children remain absent from the draft Regulation. However, our findings clearly demonstrate that adolescents still have little understanding of and knowledge about tracking practices used and the extent and sensitivity of the data collected for targeted advertising. Therefore, the final ePrivacy Regulation should be aligned with the GDPR, by recognizing that children, including adolescents, require specific protection when it comes to the processing of their communications data (Verdoodt and Lievens, 2017).

Default limitations and age-appropriate services

Furthermore, default limitations on the collection of personal data of adolescents (as well as younger children) for both the development of user-profiles and the application thereof for targeted advertising purposes might be considered (Lievens and Verdoodt, 2017). These findings resonate in the viewpoint of the Article 29 Working Party, who argued in 2013 that in the best interest of the child, companies "should not process children's personal data for behavioral advertising purposes, neither directly nor indirectly, as this will be outside the scope of a child's understanding, and therefore exceed the boundaries of lawful processing" (Article 29 Data Protection Working Party, 2013). More recently, the Working Party highlighted that as children represent a more vulnerable group of society, organizations should, in general, refrain from profiling them for marketing purposes

([Article 29 Data Protection Working Party, 2017](#)). In this regard, the present results showed that not only children but also adolescents continue to experience difficulties in understanding the persuasive and selling intent of targeted advertising, as well as being aware of the underlying data-driven mechanisms. Therefore, specific limitations on the collection and use of both children's and adolescents' communications data could be a step forward.

The study also showed that adolescents were not very effective in engaging in privacy protection behavior toward personalized advertising. In this regard, the Article 29 Working Party stresses that children should be able to exercise their rights to privacy and data protection in a manner that is adapted to their level of maturity ([Article 29 Data Protection Working Party, 2009](#), p. 29). Therefore, any protective measure against targeted advertising should take into account this lack of privacy-enhancing behavior among adolescents and their age, implying that different measures might be needed for younger adolescents as compared to older ones.

Disclosing the commercial nature of advertisements on social networking site

Aside from the rules on the use of personal data, advertisers that choose to use targeted advertising on SNS have to comply with the more general rules for commercial communication contained in the Unfair Commercial Practices Directive (Directive 2005/29/EC) and the eCommerce Directive (Directive 2000/31/EC). More specifically, advertisers are legally required to identify targeted advertisements on SNS as commercial content. In practice, the so-called principle of identification has led certain advertisers to use a type of labeling or "cues" to make commercial content recognizable ([Verdoodt et al., 2016](#)). Our results indicate that adolescents did not fully understand the persuasive intent of targeted ads, nor that these messages are based on their personal information. These findings call for an evaluation of the current practices of social media platforms that signpost commercial communication (e.g. by using words such as "sponsored"). It should be questioned whether these practices are effective when it comes to informing adolescents and succeed at fulfilling the aim of the identification principle. Insights on these issues should lead to clear policy guidelines to ensure the successful implementation of a transparent disclosure.

Practical implications

This research first of all holds implications for advertisers and marketers. For the sake of responsible advertising practice, we encourage these actors to become aware of the fact that adolescents might not be sophisticated decoders of personalized commercial communication on SNSs. Advertisers could carry out in-depth data protection impact assessments, with attention to the best interests and rights of adolescents, when setting up personalized advertising campaigns ([Verdoodt and Lievens, 2017](#)). As shown by our findings, the age and level of maturity of the adolescent should play an important role in these assessments. Based on the latter, SNS providers should subsequently adapt their data protection policies. In sum, targeted advertising undoubtedly offers an interesting opportunity to reach a young audience, but this opportunity should – at all times – be harnessed with sufficient circumspection.

In addition, some practical recommendations can be formulated toward SNS providers. First, privacy policies must be multi-dimensional, ranging from offering privacy policies that actually make sense to adolescents to adopting fair and adolescent-friendly marketing practices. For instance, a distinction could be made between users based on the age information given upon registration, thereby offering an alternate child-friendly service incorporating the same features but limited tracking for targeted advertising ([Van Alsenoy et al., 2015](#)). Second, SNS providers could consider using new types of disclosure for campaigns aimed at adolescents; one that truly arrives at accurately revealing the

persuasive nature of targeted advertisements, as well as informs its recipients about the personalized nature of the message in a clear and unambiguous way (e.g. “this is a personalized ad”). Finally, the low adoption of institutional privacy protection strategies among adolescents might call for privacy-friendly default settings. Therefore, they should be given “adolescent-friendly” information about personal data collection and processing, as well as be allowed to exercise meaningful control over its usage by the SNS provider and third parties for targeted advertising purposes (to be in accordance with Article 12 GDPR).

Finally, we can also address relevant implications for parents, teachers and educational bodies. The slow but gradual increase in advertising literacy and data collection awareness indicates that it is more crucial than ever to include (social) media literacy in school curricula, with a specific focus on ad literacy, starting from a young age. They should be taught not only at school but also at home (e.g. by their parents), that advertisers on SNSs possess innumerable pieces of information about their users and can use these data to persuade people based on personalized ads. Also, the information should be provided about how and why these persuasive messages are created and presented, which may encourage adolescents to take a critical stance *vis-à-vis* targeted advertisements on SNSs (Zarouali *et al.*, 2017). In addition, they should also be triggered to reflect on the possible consequences of these practices on their online privacy. Privacy decision-making is seldom the result of a rational calculus of costs and benefits; rather, it is often affected by misperceptions, ignorance and a lack of knowledge (Acquisti *et al.*, 2015). Therefore, it should be evaluated whether privacy literacy tools can encourage adolescents’ to engage in responsible privacy behavior on SNSs.

Limitations and directions for future research

Despite these relevant implications, this study has also some limitations that provide interesting future research venues. First, although we revealed important associations between adolescents’ age and several persuasion-related competences on SNSs, we did not investigate which theoretical processes were at the base of these age differences (e.g. cognitive development, information processing abilities, etc.), nor did we test under which conditions these differences might vary (e.g. contextual factors, personality traits, etc.). The aim of this research was to explore relationships, and subsequently, directly translate these insights into policy recommendations. As such, the theoretical contribution might be limited, but the established relationships in this study provide an impetus to test these relationships in more depth and with more theoretical sophistication. This will subsequently feed into a – much needed – wider base of knowledge contributing to theoretical advancement.

Second, this study was conducted based on a convenience sample. Although research often relies on data from nonprobability samples, scholars should still take precautions in terms of generalizing the current findings. Despite this limitation, we still argue that this study enhances our knowledge of adolescents’ engagements with personalized advertising on SNSs.

Third, in operationalizing advertising literacy, we did not specifically differentiate between understanding the *selling* and *persuasive* intent. Prior studies did make this distinction among children, and found that understanding of the persuasive intent is cognitively more complex than the straightforward purpose of the selling intent, and therefore, takes more time to develop (Carter *et al.*, 2011; Rozendaal *et al.*, 2010). Therefore, it could be relevant to take this particular distinction into consideration in future research efforts. In addition to the constructs used in this research, it would be interesting to include other cognitive advertising-related abilities (e.g. ad skepticism, critical processing, persuasion resistance, etc.), to investigate whether the developmental patterns observed in this study hold for these other abilities as well.

Fourth, we focused on what has been referred to as *dispositional* persuasion-related abilities or the *possession* of advertising literacy, disclosure knowledge and data collection awareness (Hudders *et al.*, 2017). These types of measures deliver useful insights about the general level of adolescents’ persuasion abilities. However, future research endeavors

could also focus on its *situational* counterpart or to the actual *activation* and *application* of these abilities during (and/or directly before or after) exposure to a specifically targeted advertisement on an SNS.

Finally, we assessed awareness of data collection and use by presenting on six types of data (e.g. personal information, location, visited websites, etc.). This number of presented options is arbitrary, based on what we consider to be important and commonly used data. However, it is important to note that SNSs collect innumerable pieces of personal data. In addition, as technology develops rapidly, advancements will most likely open the floodgates to even more extensive forms of data collection for advertising purposes. It is, therefore, essential that scholars keep pace with these improvements and set up scientific inquiries among a youth audience with regard to the understanding, awareness, fairness, transparency and privacy implications of these practices.

References

- Acquisti, A., Brandimarte, L. and Loewenstein, G. (2015), "Privacy and human behavior in the age of information", *Science*, Vol. 347 No. 6221, pp. 509-514.
- Aguirre, E., Roggeveen, A.L., Grewal, D. and Wetzels, M. (2016), "The personalization-privacy paradox: implications for new media", *Journal of Consumer Marketing*, Vol. 33 No. 2, pp. 98-110.
- Article 29 Data Protection Working Party (2009), "Opinion 2/2009 on the protection of children's personal data (general guidelines and the special case of schools). WP160", available at: http://ec.europa.eu/justice/policies/privacy/docs/wpdocs/2009/wp_160_en.pdf (accessed 27 November 2017).
- Article 29 Data Protection Working Party (2013), "Opinion 02/2013 on apps on smart devices, WP202", available at: http://ec.europa.eu/justice/data-protection/article-29/documentation/opinion-recommendation/files/2013/wp202_en.pdf (accessed 14 November 2017).
- Article 29 Data Protection Working Party (2017), "Guidelines on automated individual decision-making and profiling for the purposes of regulation 2016/679, opinion", available at: http://ec.europa.eu/justice/data-protection/index_en.htm17/ENWP251 Guidelines on Automated individual decision-making and Profiling for the purposes of Regulation 2016/679 Adopted on 3 October 2017.
- Barnes, S.B. (2006), "A privacy paradox: social networking in the United States", *First Monday*, Vol. 11 No. 9, available at: <http://firstmonday.org/ojs/index.php/fm/article/view/1394> (accessed 17 August 2015).
- Boerman, S.C., Kruikemeier, S. and Zuiderveen Borgesius, F.J. (2017), "Online behavioral advertising: a literature review and research agenda", *Journal of Advertising*, Vol. 46 No. 3, pp. 363-376.
- Boerman, S.C., Reijmersdal, E.A., Rozendaal, E. and Dima, A.L. (2018), "Development of the persuasion knowledge scales of sponsored content (PKS-SC)", *International Journal of Advertising*, Vol. 37 No. 5, pp. 671-697, doi: [10.1080/02650487.2018.1470485](https://doi.org/10.1080/02650487.2018.1470485).
- Boyd, D. (2014), *It's Complicated: The Social Lives of Networked Teens*, Yale University Press, New Haven.
- Carter, O.B.J., Patterson, L.J., Donovan, R.J., Ewing, M.T. and Roberts, C.M. (2011), "Children's understanding of the selling versus persuasive intent of junk food advertising: implications for regulation", *Social Science & Medicine*, Vol. 72 No. 6, pp. 962-968.
- Christofides, E., Muise, A. and Desmarais, S. (2009), "Information disclosure and control on Facebook: are they two sides of the same coin or two different processes?", *CyberPsychology & Behavior*, Vol. 12 No. 3, pp. 341-345.
- De Pauw, P., De Wolf, R., Hudders, L. and Cauberghe, V. (2017), "From persuasive messages to tactics: exploring children's knowledge and judgment of new advertising formats", *New Media & Society*, Vol. 20 No. 7, pp. 1-25.
- Debatin, B., Lovejoy, J.P., Horn, A.-K. and Hughes, B.N. (2009), "Facebook and online privacy: attitudes, behaviors, and unintended consequences", *Journal of Computer-Mediated Communication*, Vol. 15 No. 1, pp. 83-108.
- European Commission (2010), "Communication from the commission to the European parliament the council, the European economic and social committee and the committee of the Regions – smart regulation in the European Union",

- European Parliament and Council (2016), "Regulation (EU) 2016/679 of the European Parliament and of the council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (general data protection regulation)".
- Evans, N.J. and Park, D. (2015), "Rethinking the persuasion knowledge model: schematic antecedents and associative outcomes of persuasion knowledge activation for covert advertising", *Journal of Current Issues & Research in Advertising*, Vol. 36 No. 2, pp. 157-176.
- Friestad, M. and Wright, P. (1994), "The persuasion knowledge model – how people cope with persuasion attempts", *Journal of Consumer Research*, Vol. 21 No. 1, pp. 1-31.
- Gunter, B. and Furnham, A. (1998), *Children as Consumers: A Psychological Analysis of the Young People's Market*, Psychology Press.
- Gunter, B., Oates, C. and Blades, M. (2005), *Advertising to Children on TV: Content, Impact, and Regulation*, Lawrence Erlbaum, Mahwah, N.J.
- Hudders, L., Pauw, P.D., Cauberghe, V., Panic, K., Zarouali, B. and Rozendaal, E. (2017), "Shedding new light on how advertising literacy can affect children's processing of embedded advertising formats: a future research agenda", *Journal of Advertising*, Vol. 46 No. 2, pp. 1-17.
- Knoll, J. (2016), "Advertising in social media: a review of empirical evidence", *International Journal of Advertising*, Vol. 35 No. 2, pp. 266-300.
- Lievens, E. and Verdoodt, V. (2017), "Looking for needles in a haystack: key issues affecting children's rights in the general data protection regulation", *Computer Law & Security Review*, Vol. 34 No. 2, doi: [10.1016/j.clsr.2017.09.007](https://doi.org/10.1016/j.clsr.2017.09.007).
- Lilley, C. and Ball, R. (2013), *Younger Children and Social Networking Sites: A Blind Spot*, NSPCC.
- Livingstone, S., Ólafsson, K. and Staksrud, E. (2013), "Risky social networking practices among 'underage' users: lessons for evidence-based policy", *Journal of Computer-Mediated Communication*, Vol. 18 No. 3, pp. 303-320.
- McDonald, A.M. and Cranor, L.F. (2010), "Americans' attitudes about internet behavioral advertising practices", *Proceedings of the 9th Annual ACM Workshop on Privacy in the Electronic Society*, ACM, New York, NY, pp. 63-72.
- Malhotra, N.K., Kim, S.S. and Agarwal, J. (2004), "Internet users' information privacy concerns (IUIPC): the construct, the scale, and a causal model", *Information Systems Research*, Vol. 15 No. 4, pp. 336-355.
- Norberg, P.A., Horne, D.R. and Horne, D.A. (2007), "The privacy paradox: personal information disclosure intentions versus behaviors", *Journal of Consumer Affairs*, Vol. 41 No. 1, pp. 100-126.
- Ofcom (2017), "Children and parents: media use and attitudes report", available at: www.ofcom.org.uk/research-and-data/media-literacy-research/childrens/children-parents-2017
- Panic, K., Cauberghe, V. and De Pelsmacker, P. (2013), "Comparing tv ads and advergames targeting children: the impact of persuasion knowledge on behavioral responses", *Journal of Advertising*, Vol. 42 Nos 2/3, pp. 264-273.
- Raynes-Goldie, K. (2010), "Aliases, creeping, and wall cleaning: understanding privacy in the age of Facebook", *First Monday*, Vol. 15 No. 1, doi: [10.5210/fm.v15i1.2775](https://doi.org/10.5210/fm.v15i1.2775).
- Rowley, J.E., Dunne, A. and Lawlor, M.-A. (2016), "Young consumers' brand communications literacy in a social networking context", *European Journal of Marketing*, Vol. 50 No. 11, available at: www.emeraldinsight.com/loi/ejm (accessed 27 July 2017).
- Rozendaal, E., Buijzen, M. and Valkenburg, P. (2010), "Comparing children's and adults' cognitive advertising competences in The Netherlands", *Journal of Children and Media*, Vol. 4 No. 1, pp. 77-89.
- Smit, E.G., Van Noort, G. and Voorveld, H.A.M. (2014), "Understanding online behavioural advertising: user knowledge, privacy concerns and online coping behaviour in Europe", *Computers in Human Behavior*, Vol. 32, pp. 15-22.
- Taddicken, M. (2014), "The 'privacy paradox' in the social web: the impact of privacy concerns, individual characteristics, and the perceived social relevance on different forms of self-disclosure", *Journal of Computer-Mediated Communication*, Vol. 19 No. 2, pp. 248-273.
- Trepte, S. and Reinecke, L. (Eds) (2011), *Privacy Online*, Springer Berlin Heidelberg, Berlin, Heidelberg, doi: [10.1007/978-3-642-21521-6](https://doi.org/10.1007/978-3-642-21521-6).

- Tucker, C.E. (2014), "Social networks, personalized advertising, and privacy controls", *Journal of Marketing Research*, Vol. 51 No. 5, pp. 546-562.
- Valkenburg, P.M. and Cantor, J. (2001), "The development of a child into a consumer", *Journal of Applied Developmental Psychology*, Vol. 22 No. 1, pp. 61-72.
- Van Alsenoy, B. Verdoodt, V. Heyman, R. Ausloos, J. and Wauters, E. (2015), "From social media service to advertising network - A critical analysis of facebook's revised policies and terms", available at: www.law.kuleuven.be/citip/en/news/item/facebooks-revised-policies-and-terms-v1-2.pdf.
- Verdoodt, V., Clifford, D. and Lievens, E. (2016), "Toying with children's emotions, the new game in town? The legality of advergames in the EU", *Computer Law & Security Review*, Vol. 32 No. 4, pp. 599-614.
- Verdoodt, V. and Lievens, E. (2017), "Targeting children with personalised advertising: how to reconcile the best interests of children and advertisers", in Vermeulen, G. and Lievens, E. (Eds), *Privacy and Data Protection under Pressure: Transatlantic Tensions, EU Surveillance, and Big Data*, Maklu, Antwerp, Apeldoorn, Portland, pp. 313-341.
- Walrave, M., Vanwesenbeeck, I. and Heirman, W. (2012), "Connecting and protecting? Comparing predictors of self-disclosure and privacy settings use between adolescents and adults", *Cyberpsychology: Journal of Psychosocial Research on Cyberspace*, Vol. 6 No. 1, doi: [10.5817/CP2012-1-3](https://doi.org/10.5817/CP2012-1-3).
- Youn, S. (2009), "Determinants of online privacy concern and its influence on privacy protection behaviors among young adolescents", *Journal of Consumer Affairs*, Vol. 43 No. 3, pp. 389-418.
- Young, A.L. and Quan-Haase, A. (2013), "Privacy protection strategies on Facebook", *Information, Communication & Society*, Vol. 16 No. 4, pp. 479-500.
- Zarouali, B., Poels, K., Walrave, M. and Ponnet, K. (2018), "The impact of regulatory focus on adolescents' evaluation of targeted advertising on social networking sites", *International Journal of Advertising*, Vol. 38 No. 2, pp. 1-20.
- Zarouali, B., Ponnet, K., Walrave, M. and Poels, K. (2017), "Do you like cookies?' adolescents' skeptical processing of retargeted facebook-ads and the moderating role of privacy concern and a textual debriefing", *Computers in Human Behavior*, Vol. 69, pp. 157-165.
- Zuiderveen Borgesius, F.J. (2015), "Personal data processing for behavioural targeting: which legal basis?", *International Data Privacy Law*, Vol. 5 No. 3, pp. 163-176.

Further reading

- Council of the European Union (2020), "Proposal for a regulation of the European parliament and of the council concerning the respect for private life and the protection of personal data in electronic communications and repealing directive 2002/58/EC (regulation on privacy and electronic communications)".
- European Parliament and Council (2000), "Directive 2000/31/EC of the European parliament and of the council of 8 june 2000 on certain legal aspects of information society services, in particular electronic commerce, in the internal market (directive on electronic commerce)".
- European Parliament and Council (2005), "Directive 2005/29/EC of the European parliament and of the council of 11 may 2005 concerning unfair business-to-consumer commercial practices in the internal market and amending council directive 84/450/EEC, directives 97/7/EC, 98/27/EC and 2002/65/EC of the European parliament and of the council and regulation (EC) no 2006/2004 of the European parliament and of the council ('unfair commercial practices directive')".

Corresponding author

Brahim Zaroualican be contacted at: b.zarouali@uva.nl

For instructions on how to order reprints of this article, please visit our website:
www.emeraldgrouppublishing.com/licensing/reprints.htm
Or contact us for further details: permissions@emeraldinsight.com