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The intended and unintended effects of synced advertising: When persuasion knowledge could help or backfire

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ABSTRACT

Developments in digital technologies have extended the abilities of marketers to collect, process, and share consumer data to optimize personalized messages across media in real time, a strategy known as synced advertising. Previous research has found promising effects related to synced advertising. At the same time, consumer knowledge appears to be low, and informing consumers could increase their critical attitudes towards synced ads. Our eye-tracking lab study ($N = 163$) showed that informing consumers on synced advertising helps them to understand and increase their knowledge about this new marketing strategy. Moreover, this strategy increases recall of the product mentioned on TV as well as perceived surveillance. Finally, we found that all participants closed the synced ad with an average of 6.5 s and fixated on it for an average of 1.3 s. This study contributes to the growing literature on synced advertising by empirically investigating the impact of consumer knowledge on the tensions and opportunities of this new marketing strategy.

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1. Introduction

Developments in digital technologies and infrastructures have extended the ability of marketers to collect, process, and share consumer data to optimize marketing messages along the consumer journey (Bleier et al., 2020; Schweidel et al., 2022; Tucker, 2014). For example, digital marketing on mobile devices can be personalized based on consumers' real-time cross-media behavior, such as an ad on the mobile device that is simultaneously discussed in a TV show, known as synced advertising (Segijn, 2019). This technology-enabled personalization strategy seems to be a promising digital marketing strategy in a world where attention is scarce, and consumers can become easily distracted from their original goals (Batra & Keller, 2016; Duff & Segijn, 2019). Attention has been called "the new economy" and "most valuable resource" by the president of advanced advertising at Fox Networks in 2016 Cannes Lions (MacGregor, 2016), demonstrating the importance of attention for marketing and advertising professionals. Furthermore, prior studies found promising results for the effectiveness of synced ads from the marketer perspective in terms of attention (Segijn, Voorveld, & Vakeel, 2021), memory (Garaus et al.,

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2017; Hoeck & Spann, 2020), and brand attitudes (Segijn & Voorveld, 2021). However, most of these studies include scenario-based designs, and insights on how consumers respond to a synced ad when encountering one are scarce. Although scenario-based studies provide an original idea of how audiences might respond to synced ads, these hypothetical situations may not reflect how consumers interact and respond when encountering a synced ad. Research in which consumers will be exposed to a real synced ad can provide us with better managerial implications.

However, from the consumer perspective, concerns have been raised about the lack of consumer knowledge on such marketing strategies, and to what extent consumers can be informed decision makers when they lack knowledge (Strycharz et al., 2021), as well as privacy and ethical concerns related to such practices (Bleier et al., 2020). Both in the U.S. and Europe, research has shown that there is a lack of knowledge about synced advertising among consumers (Boerman & Segijn, 2022; Segijn & Van Ooijen, 2022). Increase in consumer knowledge is necessary to minimize this imbalance, which can affect how people cope and respond to a synced ad. Prior research in synced advertising literacy found that informing consumers who have limited synced advertising knowledge and experience leads to more resistance towards a synced ad and therefore more critical attitudes towards the strategy (Segijn et al., 2023). Still, how informing consumers on synced advertising (i.e., increasing their knowledge of this strategy) would affect marketing outcomes, such as brand memory and brand attitudes, is to our knowledge, not yet known. Filling this gap is a much-needed requirement given the prevalence of synced advertising (Kantrowitz, 2014), consumers' limited synced advertising literacy (Boerman & Segijn, 2022; Segijn & Van Ooijen, 2022), and worrisome consequences for consumers' privacy (Segijn, 2019; Southerton & Taylor, 2020). Specifically, informing consumers on synced advertising may not only empower them to make informed decisions (Strycharz et al., 2019, 2021), it could also lead to perceptions of surveillance (Segijn et al., 2023). Subsequently, these perceptions of surveillance pose a threat to an individual's sense of privacy (Southerton & Taylor, 2020) and autonomy (Büchi et al., 2022). Additionally, it may have negative implications for marketers because perceived surveillance could contribute to consumers' resistance to the marketing efforts (Farman et al., 2020; Segijn et al., 2023). Therefore, more insight on the effects of increased knowledge of synced advertising is needed.

The current eye-tracking study advances the theories of personalized marketing and practices of synced advertising as a new marketing strategy. The aim of this study is to examine how informing consumers on synced advertising would impact how they interact with and respond to a synced ad. The current study offers at least three contributions. First, this study provides insights on how synced advertising knowledge can be increased by studying the effect of informing consumers on synced advertising knowledge, which could provide insights for advertising literacy programs. Second, this study provides insights into attention to synced ads by tracking consumers' attention when a synced ad appears using tablet analytics and eye-tracking glasses. Through this research, we will be able to provide managerial implications related to the duration of ad exposure and visual attention (e.g., fixation duration) to a synced ad, as well as test whether this differs depending on whether consumers are informed or not about the synced advertising strategy. Third, we contribute to a better understanding of *whether* and *how* synced advertising literacy could impact synced advertising effects. We propose a cognitive path in which consumers informed about this technology will pay more attention to the synced ad they encounter, leading to better memory of the product, brand, and ad. In addition, we propose an affective path in which informed consumers will be high in perceived surveillance, which in turn leads to less positive brand attitudes. Together, the proposed paths allow us to study the tensions and opportunities of new technologies in this new form of personalization and will provide further managerial implications for marketing professionals and for marketing ethics.

Personalization enabled through advancements in technology and sophisticated data collection offers benefits to both consumers and digital marketers (Schweidel et al., 2022). For example, improving marketers' ability to obtain and act on data can provide advantages over their competitors, while more efficient marketing activities can lead to lower prices and services that better meet consumers' needs (Hagiu & Wright, 2020). The privacy preferences of consumers have also expanded over time to include the protection of new types of information, such as information related to media consumption behaviors (Goldfarb & Tucker, 2011). Therefore, digital marketers are challenged to leverage technology-enabled enhancements to the consumer journey while navigating consumers' nuanced preferences for the privacy-personalization tradeoff (Schweidel et al., 2022). Insight into informing consumers and how this affects synced advertising's effectiveness could help extend literacy programs beyond traditional marketing strategies to consider emerging ethical dilemmas in a synced advertising environment. Moreover, knowledge on synced advertising effects helps steer societal debates regarding privacy concerns, ethics, and consumer empowerment. Finally, the study is innovative as it combines eye-tracking technologies, tablet analytics, and self-reported survey responses to advance our knowledge on this new marketing strategy.

2. Literature review

2.1. Introducing synced advertising

Synced advertising is a digital marketing strategy in which an ad on a mobile device is synchronized with other media content in real time (Segijn, 2019). For example, when consumers are watching TV and using their smartphones at the same time, they receive an ad on their smartphones that is related to what is being discussed on TV. Digital signals can then be used to personalize an ad based on the consumer preference (Schweidel et al., 2022). This is made possible by a combination of automated content recognition techniques and programmatic advertising (Garrity, 2018). Synced advertising is a form of

cross-media personalization that combines consumers' offline (i.e., non-Internet based) and online activity, which has previously been found to lead to a synergy effect in a different context (Lesscher et al., 2021).

Synced advertising is a unique form of cross-media personalization in terms of the timing of the ad and the type of personalization. First, synced advertising can be distinguished from other forms of (cross-media) personalization because messages are personalized in *real time* based on *current* media behaviors rather than on previous media usage (Segijn & Voorveld, 2021). Second, whereas other personalization strategies might offer a message that is tailored to consumers' characteristics, needs, or preferences (Montgomery & Smith, 2009; Wedel & Kannan, 2016), this might not be the case for synced advertising. Rather, it offers an ad personalized based on concurrently consumed media content, which reflects consumers' behaviors but might not directly match their needs or preferences.

Synced advertising is argued to be a potentially effective cross-media personalization strategy because it is considered a possible solution designed to draw attention from consumers who are multitasking (Duff & Segijn, 2019; Segijn, 2019). This may lead to a synergy effect similar to other cross-media campaigns (Segijn, 2019; Segijn & Voorveld, 2021). Indeed, first studies found promising results for synced advertising in terms of attention paid to the synced ad (Segijn, Voorveld, & Vakeel, 2021), brand recall and recognition (Hoeck & Spann, 2020), and brand attitudes (Segijn & Voorveld, 2021; Study 1). However, other studies found no effects on memory (Garaus et al., 2017) or brand attitudes (Segijn & Voorveld, 2021; Study 2).

Many studies that have focused on personalized advertising, such as synced advertising, are conducted as online (scenario-based) experiments (Boerman et al., 2017; see the overview of studies in synced advertising the Appendix, Table A). Although online study settings have been widely used, they come with their own limitations. For example, in online experiments there is less control over distractions that are not part of the experiment (e.g., noise, people, other media content) compared to lab experiments (Clifford & Jerit, 2014). Moreover, many of the studies on synced advertising make use of hypothetical text-based scenarios in which they describe what *could* happen when consumers watch TV and use a mobile device at the same time. Although these scenario-based online studies can help us understand consumers' thoughts about how they might respond if they encounter a synced ad, they do not tell much about their actual reactions to a synced ad. Additionally, a characteristic of synced advertising is that it happens across screens, but this was not reflected in many of these studies that made use of scenarios or a split screen (for an exception, see Hoeck & Spann, 2020; Lee et al., 2023). Therefore, despite the growing research interest in synced advertising, little is known about how consumers interact with and respond to a synced ad when encountering one. Moreover, we do not yet know whether these responses would differ depending on whether consumers are informed or not about synced advertising.

Research has recently found that consumers' knowledge level on synced advertising is low (Boerman & Segijn, 2022; Segijn & Van Ooijen, 2022). A survey conducted among U.S. adults showed that their knowledge on synced advertising is lower than their knowledge on online behavioral advertising (Segijn & Van Ooijen, 2022). Similarly, a survey among Dutch consumers also confirmed consumers' low awareness of and familiarity with synced advertising (Boerman & Segijn, 2022). A recent study showed that increased awareness of synced advertising by informing consumers about the strategy led to more critical attitudes and perceived surveillance, and subsequently created more resistance to a synced ad (Segijn et al., 2023). Hence, current awareness and knowledge of synced advertising is low, but informing consumers about this new marketing strategy could potentially change the effectiveness of it. Therefore, we ask:

RQ1: (a) How do people engage with a synced ad (i.e., exposure duration, close time, click-through rate, and intention); and (b) to what extent is this different for informed vs. uninformed people?

2.2. Intended and unintended effects of synced advertising

The current study investigates how consumers interact with and respond to a synced ad, and to what extent this differs depending on whether they are informed about this marketing strategy or not. Specifically, we present two paths, together representing the tension and opportunities of new technologies in marketing. First, we will explain the cognitive path that predicts how informing consumers could increase attention and subsequently product, brand, and ad memory. Second, we will explain the affective path that predicts how providing consumers with information about this marketing strategy could increase perceived surveillance when encountering a synced ad, resulting in less positive brand attitudes (Fig. 1).

First, we propose that, when consumers are informed about synced advertising, they will show better memory about the product, brand, and elements in the synced ad than when they are uninformed (**H1**). This could be explained by attention to the synced ad (Fig. 1a). In their Persuasion Knowledge Model (PKM), Friestad and Wright (1994) argue that consumers develop personal knowledge about the tactics used in persuasion attempts, and that consumers access this persuasion knowledge, at least partially, whenever they want to understand what is going on as they are being confronted with an ad. In the case of a synced ad, consumers can use their persuasion knowledge to cope with it by recognizing, analyzing, interpreting, and evaluating the message, and then choosing the response that fits their own goals and aims.

As persuasion knowledge guides consumers' attention to aspects of a message in order to be able to cope with it, we expect consumers to pay more attention to a synced ad when they understand its tactics and motives. A previous eye-

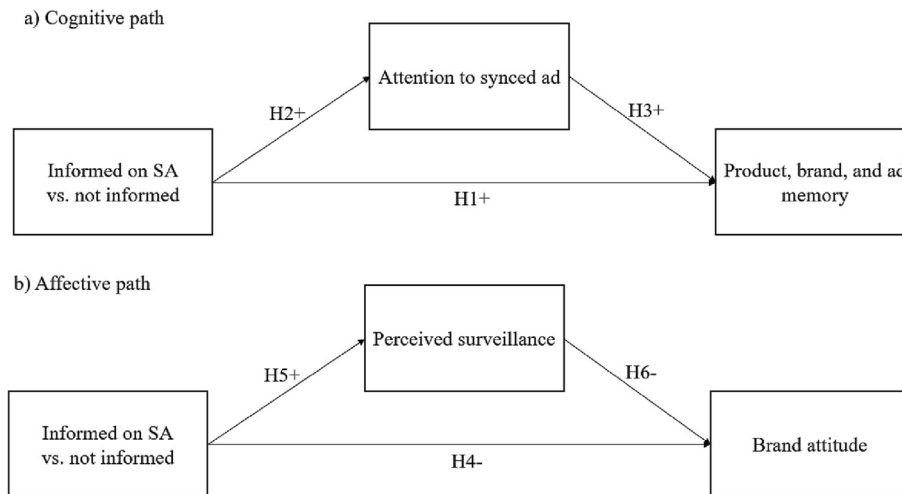


Fig. 1. Conceptual model.

tracking study has found that increasing persuasion knowledge of persuasive messages by including disclosures in programs containing brand placement increases attention to the persuasive message (Boerman et al., 2015). Similarly, we expected that increased synced advertising literacy will lead to more attention to synced ads (H2, Fig. 1a¹).

Subsequently, more attention is expected to lead to more product, brand, and ad memory (H3). The first step for effects is exposing consumers to an ad and gaining their attention (Barry, 1987; Batra & Keller, 2016). For a message to get into a consumer's brain, it needs to be encoded (Lang, 2000). The process of encoding means engaging with the message through sensory receptors (e.g., eyes). Then, it needs to be transformed into activated mental representations in working memory.

Whether something is transformed depends on a consumer's goals (e.g., I am interested in this product; top-down) and activation by the stimulus (e.g., a vivid or novel ad; bottom-up). Indeed, existing empirical studies using eye-tracking have constantly examined the link between attention and memory and demonstrated the predicting role of visual attention in enhancing memory (e.g., Goodrich, 2011). In the case of synced advertising, an ad is simultaneously discussed on TV and presented on a mobile device, and thus attention could be driven by bottom-up processing because repetition of the ad may make it more salient (Segijn, Voorveld, & Vakeel, 2021). Additionally, top-down processes may play a role when the consumer is interested in what is being presented on one of the two screens (Segijn, 2019). Indeed, Hoeck and Spann (2020) found that the probability of recalling a brand increases when an additional ad of the same brand is shown across media.

2.3. Affective path: Perceived surveillance and brand attitude

Second, we propose that when consumers are informed about synced advertising, they will have less positive brand attitudes towards the synced ad than when they are not informed (H4). The relationship between information on synced advertising and brand attitudes could be explained by perceived surveillance (Fig. 1b). Surveillance is defined as "the watching, listening to, or recording of an individual's activities" (Solove, 2006, p. 490). We refer to *perceived* surveillance as the uncomfortable feeling of being watched or monitored by someone else. This feeling of being watched could be activated when the consumer is aware of data collection practices, for example, by being informed about synced advertising and its data collection techniques (Segijn et al., 2023).

According to the Persuasion Knowledge Model, persuasion knowledge of a given marketing strategy is developed through first- and secondhand experiences, such as conversations with others, media attention, or via interventions (Friestad & Wright, 1994). Given that consumers' knowledge of synced advertising is low (Segijn & Van Ooijen, 2022), informing them may help to develop their understanding of the persuasive tactic, and make them realize that synced ads are based on their personal data. An in-depth interview study showed that data collection techniques for personalized advertising increased perceptions of surveillance (Phelan et al., 2016). In addition, given that consumers consider cross-website targeting (i.e., targeting based on consumers' behavior on different media platforms) more pervasive than within-website targeting (Kim et al., 2019), synced advertising, another cross-platform strategy, can increase consumers' perceived surveillance even more. Therefore, we expect that consumers who are informed about synced advertising will experience more perceived surveillance when confronted with a synced ad than uninformed consumers (H5).

In addition, consumers' perceived surveillance can affect their responses to synced ads. Reactance theory provides a theoretical lens for predicting the effects of perceived surveillance on ad outcomes (Brehm & Brehm, 1981). According to reac-

¹ All hypotheses were preregistered but numbered differently to follow the order in which they are presented in the manuscript.

tance theory, when consumers experience a threat or loss to their free behavior, a motivational state of reactance emerges, leading to efforts to restore their freedom (Brehm & Brehm, 1981). In the context of synced advertising, when consumers feel that they are being surveilled and persuaded by a brand, this may limit their perceptions of freedom and autonomy. Consequently, consumers who perceive being under surveillance will experience reactance to re-establish their freedom, which they may feel is threatened by synced advertising. Indeed, research shows that perceived surveillance leads to psychological reactance, resulting in negative attitudinal responses to ads (Farman et al., 2020). In line with this, we predict that perceived surveillance will negatively affect consumers' attitudes toward the brand (**H6**).

3. Methods

3.1. Design and participants

As outlined in the OSF preregistration,² we conducted an eye-tracking lab experiment with two between-subjects conditions (informed vs. uninformed about synced advertising) in Fall 2021. Participants were randomly assigned to one of the two conditions, where they either received information on synced advertising or not. The participants in the informed condition were asked to read a website about synced advertising, while those in the uninformed condition read a website about a fictitious advertising agency. After this, all participants experienced receiving a synced ad in the second part of the study.

A total of 170 adults were recruited through subject pools or student communication channels at a U.S. university over the course of the semester. Because participants were asked to wear eye-tracking glasses, people wearing eyeglasses were excluded from the study, and only adults who had normal or corrected-to-normal eye vision, or who wore contact lenses, could participate in the study. After data cleaning, the final sample consisted of 163 participants ($M_{age} = 21.09$, $SD_{age} = 4.70$, 68.7% female). Following the preregistered guidelines, seven participants were removed because they indicated that their data should not be used ($n = 3$), there were technical errors ($n = 3$), or they failed multiple attention checks ($n = 1$). Given the preregistered sample size based on a power analysis, and the mean ($n = 73$) and median ($n = 60$) sample size of existing eye-tracking studies (King et al., 2019), the final sample of this study demonstrated an appropriate size for further analysis.

3.2. Procedure

Upon IRB approval, an eye-tracking lab experiment was conducted with a cover story to disguise the study purpose. Once participants entered the lab, consisting of two rooms, we told them they would participate in two separate studies: a study on website design ('Study 1') and another study on media multitasking ('Study 2'). The real purpose of 'Study 1' was to inform half of the participants about synced advertising, which they then all experienced in 'Study 2'. The total duration of study participation was 45–60 min per participant. Because of COVID safety protocols, only one participant could be in the lab at any given time.

When they agreed to participate using IRB consent forms, participants entered the first room where a desktop computer with a fixed eye-tracker (Tobii X3 120 Hz) was placed. The eye tracker ensured that participants spent time reading the information, which had been reported to be an issue in previous (online) research in synced advertising literacy (Segijn et al., 2023). Participants were told to review a website on clarity and design. They could take as long as they needed to look at the website image and they would be asked to fill out questions about it afterwards. After the instructions, the researcher left the room and participants viewed the given website, which contained different information based on the study condition (informed: synced advertising vs. uninformed: a fictitious advertising agency; see osf²). Once they completed viewing the website, participants moved to the second room and answered filler questions about the clarity and design of the website on a laptop.

Next, in the second room, where a large TV screen, a tablet, and a mobile eye-tracker (Pupil Core) were located², participants were asked to wear the mobile eye-tracker glasses. To ensure that the mobile eye-tracker captured what participants saw, we adjusted the eye cameras and front camera of the mobile eye-tracker to capture both the participants' pupils and the front side of their view. We used mobile eye-tracker glasses as opposed to screen-based fixed eye-trackers to capture attention to both screens as well as switching behaviors, as was previously used in multitasking research (Segijn et al., 2017). Participants were told to move their heads when switching between the TV and the tablet. Additionally, they were told that this study was on media multitasking, which was a cover story. They were asked to divide their attention equally between both the TV and tablet screens and they were told that they would receive questions about both pieces of content afterwards. Nothing was mentioned about an ad that would appear.

After the calibration process was completed, the researcher left the room and participants watched a 7-minute video clip of a selected TV show on a TV screen while using a tablet to read a student magazine at the same time. When the main characters of the TV show discussed frozen yogurt, a frozen yogurt ad appeared on the tablet (i.e., a synced ad). The synced ad remained on the tablet screen until the participants closed it, which all of them did. All procedures and contents in the second room were identical for all participants. Afterward, participants filled out a second questionnaire, provided demographic

² Anonymous link to preregistration, including hypotheses, stimulus material, questionnaire, and study procedure: https://osf.io/k5y7r/?view_only=71174ad576c14d2f9fbb8e80689ddfcc.

information, and were debriefed about the real study purpose. Each participant was given a \$25 gift card or university research credits for participating. See the osf registration for the study procedure overview².

Finally, we included an open-ended question for the cover story check at the end of the questionnaire. Seventeen participants (all in the informed group) mentioned the connection between both studies. Because only four of these participants mentioned the connection in their answer to the question, 'Why do you think the banner ad appeared on the tablet?' that was asked earlier in the questionnaire, this result could have been influenced by the questionnaire rather than reflecting what they thought during the experiment. Excluding these seventeen participants from the analyses did not change the results between conditions. Therefore, we kept these participants in the dataset.

3.3. Stimulus material and pretest

We used four stimuli in this study: (1) Two website images, (2) a TV show episode, (3) a magazine app, and (4) an ad from an unfamiliar brand. First, we developed two website images for the two study conditions². In the informed condition, the website contained information about synced advertising so participants could read the synced advertising introduction, how the technology works, and an example of synced advertising. In contrast, for the uninformed condition, the website contained information about a fictitious advertising agency so participants could read an overview of the agency and learn about one of its digital marketing campaigns. We chose the ad agency for the uninformed condition to keep advertising priming across conditions consistent, without informing the uninformed condition participants about synced advertising or other related marketing strategies (Segijn et al., 2023). An identical layout was used for both websites. Hence, except for the text, both websites looked similar.

Out of eight TV shows, the TV show *The Good Place: Episode 1* was selected in a pretest ($N = 35$, $M_{age} = 35.83$, $SD_{age} = 10.12$, 37.1% female). We selected a TV show that was relatively gender-neutral in terms of enjoyment and also included a product placement or product mention that was not very familiar among the study population. *The Good Place* appeared to be a well-liked show among both men and women (based on the questions, 'How enjoyable do you find watching the following TV shows?' on a 7-point scale; Men: $M = 4.81$, $SD = 2.04$ vs. Women: $M = 5.75$, $SD = 1.28$, $p = .250$) and none of the participants related frozen yogurt to the program. We created a 7-minute clip from the start of the episode. The 7-minute duration allowed participants enough time to get familiar with the show and practice multitasking while minimizing the risk of fatigue. Partway through the clip, one character observes that there are a lot of frozen yogurt places in the neighborhood, to which the other character responds, "People love frozen yogurt." This quote corresponds with text in the synced ad that was displayed on the tablet after 287 s, simultaneously with the conversation of the characters.

Finally, a 48-page magazine was created by students in a college journalism class. This magazine was used in an app, which was specifically designed for this study. While participants were watching a TV show, they were able to scroll and zoom in on content as they wished on the tablet. No matter which page the participant was currently reading, after 287 s, an ad displayed as a second layer over the center of the magazine². We used a tablet rather than a smartphone because a bigger screen would allow us to more reliably capture attention with the mobile eye tracker. The frozen yogurt brand "Verka" was chosen from another pretest ($N = 40$, $M_{age} = 39.10$, $SD_{age} = 11.46$, 30.0% female) because the study population was not very familiar with it and had relatively neutral attitudes towards it (Geuens & De Pelsmacker, 2017). Specifically, we tested six brand names and selected a brand that had very low familiarity ($M = 1.39$, $SD = 0.86$) and neutral attitudes, which was statistically different from the mid-point of 3 on a 5-point scale ($M = 3.03$, $SD = 0.59$; $t(39) = -0.467$, $p = .643$).

3.4. Variables

A combination of open-ended questions, multi-item scales, eye-tracking data, and tablet analytics were used to measure the variables. Table 1, Appendix Table B, and the OSF registration² present a detailed overview of the items, reliability scores, and overall mean and standard deviations.

3.4.1. Synced advertising persuasion knowledge

An open-ended question asked participants to describe why participants thought the frozen yogurt ad appeared on the tablet to assess synced advertising persuasion knowledge. The open-ended answers were independently coded by three undergraduate student coders after receiving 5+ hours of coder training including practice coding sessions and meetings to talk through inconsistencies. The students were asked to code (0 = no, 1 = yes) whether the participant made an explicit connection between the ad on the tablet and the content of the TV show in their answer (e.g., 'It [the ad] showed up when they were talking about frozen yogurt in the video'). Krippendorff's alpha indicated good intercoder reliability (Krippendorff's alpha = 0.79).

Additionally, based on the procedure in previous studies (McDonald & Cranor, 2010; Segijn & Van Ooijen, 2022; Smit, Van Noort, & Voorveld, 2014), we presented the participants with eight knowledge statements about synced advertising (Table 1). Participants had to indicate whether they thought the statement was true or false. In a second step, the participants were presented with their answers and asked to what extent they were confident that their answer was correct (1 = extremely unconfident – 7 = extremely confident). A sum score was calculated from all correctly answered statements (0–8). Additionally, we calculated confidence in knowledge by: 1) recoding correct answers to 1 and incorrect answers to –1; and 2) by multiplying these scores by their confidence value (Segijn & Van Ooijen, 2022).

Table 1
Synced advertising knowledge statements.

Synced Advertising Knowledge Statements	Factual knowledge % correct	Confidence in knowledge	
		M	SD
The ads that people receive on their mobile device might differ depending on what other media content (TV, radio) is simultaneously consumed.	92%	4.80	3.00
Companies know what people are watching/listening to because media content (TV/radio shows) sometimes contain a sound signal that can be picked up by a mobile device.	69.9%	2.14	4.52
Companies can advertise on one device based on information collected through another device at the same time .	85.3%	4.01	3.45
Technology already exists that makes it possible to receive ads on your mobile device based on your current (real-time) watching behavior on TV.	88.3%	4.52	3.18
A company can show me an ad on my mobile device from a brand at the same time that I am watching a television commercial from that brand.	74.8%	2.77	4.27
It is a coincidence when people receive an ad on their mobile device that is related to what they are concurrently listening to on the radio.*	86.5%	3.50	3.75
It is impossible for a mobile app to listen to a television show that people are watching, and use this information to provide those people with ads based on the show's content.*	94.5%	4.05	2.83
It is impossible for companies to collect information about the shows that people watch on television, and simultaneously advertise relevant products/brands on those people's mobile devices.*	92.6%	3.93	3.03

Note. *False statements.

3.4.2. Synced advertising engagement

For each participant, tablet analytics that indicated participants' interaction with the ad and magazine were collected. Specifically, we focused on: 1) whether the participant closed the ad (0 = no, 1 = yes); 2) how long the ad was displayed in the magazine app before it was closed by the participant (in milliseconds); and 3) whether the participant clicked on the 'order now' button in the ad (0 = no, 1 = yes).

3.4.3. Attention to the synced ad

We measured attention to the synced ad with a self-reported measure and the mobile eye-tracking data. The self-reported measure of attention asked: 'How much attention did you pay towards the ad on the tablet?' on a scale of 0–100, where 0 indicated *no attention* and 100 indicated *full attention* (Bellman et al., 2019). Additionally, an independent student coder – blind to the study objectives and not knowing which participant belonged to what condition – coded the eye-tracking data of all participants. Using Pupil Player v3.4.0 software, she coded all the fixations that were located on the ad. A sum score of all the durations per fixation on the ad was calculated to get a duration score per participant (*Fixation duration on synced ad*). Given that the eye-tracking data was skewed (skewness = 1.51), which is not unusual for eye-tracking data, we used a logged transformation (LG10) resulting in a normal distribution for hypothesis testing. However, using this or the original variable resulted in the same results.

To provide more insight into synced advertising attention, we included additional mobile eye-tracking metrics. All eye-tracking variables are displayed in milliseconds unless otherwise indicated. *Ad display time recorded by eye-tracking* represents the real time between the first and last fixation, when the synced ad was displayed, regardless of whether the participant fixated on it. *Sum of all fixations* is the sum of the fixation duration when the synced ad was displayed regardless of whether the participant fixated on it. Differences between ad display time and sum of all fixations could be explained by short gazes that did not count as fixations (<0.80 ms), and by missing data.

Time to first fixation (TTFF) is the duration in milliseconds between the synced ad appearance and the first fixation on the synced ad. Additionally, we measured *fixation duration on the tablet* (including and excluding duration to the ad on the tablet), *fixation duration on TV*, and *fixation duration on 'other'* (i.e., other than on the synced ad, tablet or TV). Also, we measured whether the participants fixated on the TV (*TV fixation*) before the participant closed the synced ad but after they had fixated at least once on the synced ad (1 = yes, 0 = no). Finally, we also recorded what was fixated on (i.e., TV, tablet, other) when the synced ad appeared.

3.4.4. Memory of product and brand

Using open-ended items, participants separately listed the product they saw on the TV and the tablet (product recall), and the brand from the tablet (brand recall) (Appendix Table B). If they did not remember seeing a product or brand, participants could leave these fields open. Participants were then shown a list of nine frozen yogurt brands and asked to indicate which ones they remembered seeing on the tablet or TV. They also had an 'I have not seen a brand' option.

Two members of the research team independently coded the open-ended product memory responses based on whether frozen yogurt or a closely related product (e.g., yogurt, ice cream) was mentioned (0 = no, 1 = yes). The open-ended brand memory responses were coded according to whether the brand was mentioned and spelled correctly with minor typos (0 = no, 1 = yes). Intercoder reliability showed perfect reliability for both product TV and tablet recall (Krippendorff's alpha = 1, 100% percent agreement), and one difference in brand recall (Krippendorff's alpha = 0.80, 99.4% percent agreement). Consen-

was reached for the one difference in the final data. Finally, we also measured a combined score of memory (Table 4 & Appendix Table B) that was used to test the cognitive path of the model.

3.4.5. Brand attitude

To measure brand attitude, participants rated the brand using six semantic differential scales (e.g., *unappealing - appealing*, *unpleasant - pleasant*) based on research by Crites et al. (1994).

3.4.6. Perceived surveillance

To measure perceived surveillance, we asked, 'When the ad appeared on the tablet while watching TV, I had the feeling that advertisers were...'. This was followed by four statements (i.e., 'looking over my shoulder', 'watching your every move', 'checking up on you', 'entering your private space'), validated by Segijn, Opre, and Van Ooijen (2022).

4. Results

4.1. Synced advertising persuasion knowledge

To verify that the manipulation was successful, we looked at whether participants understood *why* they received the ad on the tablet and their responses to the synced advertising knowledge questions. In total, 70 participants (81.4%) of the informed condition, and 41 (53.2%) of the uninformed condition indicated that they recognized a connection between the product, brand, or ad, and the content of the TV show in their answer, $\chi^2(1) = 14.82, p < .001$.

Additionally, informing participants about synced advertising through the website led them to have more correct knowledge statements ($M = 7.08, SD = 1.22$) than the participants who read the website on the advertising agency ($M = 6.57, SD = 1.74$), $t(161) = 2.182, p = .031$. Also, informed participants were more confident in their synced advertising knowledge ($M = 4.09, SD = 1.84$) than uninformed participants ($M = 3.29, SD = 2.37$), $t(161) = 2.418, p = .017$. Thus, our manipulation was successful.

4.2. Synced advertising engagement

To answer the first research question on synced advertising engagement, we examined the tablet analytics and the mobile eye-tracking data. Tablet analytics showed that, on average, the ad was displayed for 6548.71 ms ($SD = 4848.73$; range 1640–34046 ms) before being closed by the participants, which did not differ significantly depending on whether participants were informed or not, $t(152) = 0.463, p = .644$ (Table 2). Moreover, participants fixated on the synced ad for an average of 1292.72 ms ($SD = 819.01, n = 99^3$). On average, time to first fixation on the synced ad after the ad had appeared was 401.87 ms ($SD = 1105.65$). This includes the participants who directly fixated on the ad when it appeared. Excluding those participants who directly fixated on the synced ad, the average time to first fixation on the synced ad was 545.00 ms ($SD = 258.21$). About half of these participants were fixated on the tablet when the ad appeared (54.8%, $n = 40$).

Additionally, 11.0% ($n = 8$) of the participants were fixated on the TV when the ad appeared, 21.9% ($n = 16$) looked somewhere other than the TV or tablet, and 12.3% had missing data. Additionally, we found that a small percentage of participants (10.4%) looked up to the TV after having fixated on the synced ad and before closing it. Although the percentage did not differ significantly across conditions, these participants were more likely to understand the reason why they received the synced ad compared to participants who did not look up ($\chi^2(1) = 6.23, p = .013$).⁴

Finally, tablet analytics showed that all participants closed the ad and only three participants (18%; 2 informed and 1 uninformed participant) clicked on the 'order now' in the ad. Table 2 shows an overview of the means and standard deviations of the tablet analytics and eye-tracking metrics per condition. None of these metrics were significantly different between the informed and uninformed participants.

4.3. Direct effects

Table 3 provides an overview of the mean and standard deviations for the variables per condition. Table 4 shows the results for the memory items. Regarding memory, the results showed that informing participants on synced advertising leads to more overall memory of the product, brand, and ad when participants are informed about synced advertising than when they are not informed (Table 3), $t(161) = 2.247, p = .026$. More specifically, the results (Table 4) showed that informing participants about synced advertising leads to more TV product recall ($\chi^2(1) = 11.30, p = .001$), and demonstrated whether participants recalled the same product on TV and the tablet ($\chi^2(1) = 12.49, p < .001$). We did not find a significant difference

³ The n of the mobile data is included because of missing data due to technical issues (e.g., eye-tracking data was not captured for these participants) or low fixation quality (e.g., fixations were not recorded).

⁴ Because of missing data due to technical issues (e.g., eye-tracking data was not captured for these participants) or low fixation quality (e.g., fixations were not recorded), the n per metric differed. To compare results, Table C and Figure A in the Appendix show an overview of the duration metrics for the participants that had no missing data on any of the variables included in the Table ($n = 89$).

Table 2
Synced advertising engagement metric overview.

Variable	n ^a	Informed	Uninformed
		M (SD)	M (SD)
Tablet analytics			
Ad display time in milliseconds	154	6718.67 (4982.78)	6355.15 (4718.74)
Did the participant click on 'order now'?	154	0.02 (0.16)	0.01 (0.12)
Eye-tracking metrics			
Fixation duration on synced ad ^b	96	1323.98 (1477.43)	1277.07 (1281.41)
Time to first fixation	96	516.97 (1471.03)	279.76 (429.82)
Time to first fixation (excl. 0's)	70	640.06 (1615.86)	439.62 (470.47)
Fixation duration on tablet while ad was displayed (incl. fixations on ad)	131	1565.05 (1774.70)	1542.93 (1524.89)
Fixations on tablet while ad was displayed (excl. fixations on ad)	96	698.67 (758.60)	713.97 (588.08)
Fixation duration on TV while ad was displayed	126	172.36 (703.88)	171.47 (696.88)
TV fixations	96	9.1% (n = 44)	11.5% (n = 52)

Note. All durations are displayed in milliseconds unless indicated differently. ^a The *n* of the mobile data is included because of missing data due to technical issues (e.g., eye-tracking data was not captured for these participants) or low fixation quality (e.g., fixations were not recorded). ^b The original variable was used here, not the log transformation. When including all changes (incl. other), the means were higher for both groups (Informed *M* = 1.26, *SD* = 1.66), uninformed *M* = 1.75, *SD* = 2.53).

Table 3
Overview of means and standard deviations per condition.

Variable	Informed <i>M</i> (<i>SD</i>)	Uninformed <i>M</i> (<i>SD</i>)
Why do you think the synced ad appeared?	0.81***(0.39)	0.53***(0.50)
Ad attention (self-report)	39.15(28.28)	40.56(31.96)
Memory	2.15*(0.99)	1.81*(0.97)
Brand attitude	3.98(0.94)	4.19(1.76)
Perceived Surveillance	5.21*(1.20)	4.67*(1.76)

*** *p* < .001, * *p* < .05.

Table 4
Memory item results.

Memory item	Informed (<i>n</i> = 86)	Not informed (<i>n</i> = 77)
	% correct	% correct
TV product recall**	44.2%	19.5%
Tablet product recall	73.3%	61%
Same product on both devices***	40.7%	15.6%
Brand recall	1.2%	2.6%
Brand recognition	7.2%	5.5%
Ad recognition	79.1%	71.4%

***, *p* < .001. **, *p* < .01. Note. 'Same product on both devices recall correctly' was based on the answers given to the TV product recall and tablet product recall questions. This item was not included in the overall memory variable (See Table 2).

between the conditions for tablet product recall ($\chi^2(1) = 2.763, p = .096$), brand recognition ($\chi^2(1) = 0.198, p = .656$), and ad recognition ($\chi^2(2) = 2.029, p = .363$).

Because only three participants recalled the brand name, we did not perform a chi-square test for brand recall. Therefore, H1 was only supported for overall memory, product recall on TV, and whether the participants recognized the same product on both screens. Additionally, the results showed no significant differences between the conditions in terms of brand attitude (Table 3), $t(160) = -1.376, p = .171$. Therefore, H4 – that predicted the direct effect of informing consumers on brand attitudes – was not supported.

4.4. Indirect effects

To test the mediation hypotheses (Fig. 1), we conducted separate PROCESS models (Model 4) for the different paths with the condition as the independent variable and 5,000 bootstrap samples. First, we tested the cognitive path (i.e., attention, memory). We used the self-reported measure of attention and the logged transformation of the synced advertising ad fixations in two separate models. The results showed no difference in synced ad fixations depending on the condition ($b = -0.08$, $p = .463$), and in self-reported attention to the ad depending on the condition ($b = -1.41$, $p = .766$), not supporting H2. However, we found that, besides a direct effect of the condition on memory in total (direct effect = 0.36, $SE = 0.15$, 95% BCBCI [0.06, 0.65]), self-reported attention led to more memory in total ($b = 0.01$, $p = .002$). However, ad fixations were not significantly related to memory in total ($b = 0.17$, $p = .364$). Therefore, we could only support H3 for self-reported attention.

Second, we tested the affective path (i.e., perceived surveillance, brand attitude). As expected, we found that, compared to uninformed participants, informed participants perceived more surveillance when they saw the ads on the tablet which was synchronized to the TV show ($b = 0.54$, $p = .022$), supporting H5. However, neither informing the participants ($b = -0.18$, $p = .240$) nor perceived surveillance ($b = -0.05$, $p = .338$) affected brand attitudes. Thus, H6 was not supported because besides no direct effect (direct effect = -0.18 , $SE = 0.16$, 95% BCBCI [-0.49, 0.12]), no indirect effect (indirect effect = -0.03 , $SE = 0.03$, 95% BCBCI [-0.11, 0.03]) was found on brand attitudes.

4.5. Additional analysis⁵

Previous research (Segijn et al., 2023) has found that providing participants with information only led to an increase in synced advertising knowledge for participants without any prior advertising experience beyond advertising exposure (e.g., through education, work experience). Therefore, we asked participants to indicate whether they: 1) follow(ed) classes in advertising, 2) had work experience (including internships, workshops) in the field of advertising, 3) attended a (guest) lecture on synced advertising, or 4) had a family member/friend/partner working in the advertising industry. About half of the participants (53.9%) checked at least one of these boxes. Additionally, this group was randomly divided over the two conditions (informed = 56.3%, uninformed 51.3% with ad experience beyond ad exposure), $\chi^2(2) = 0.420$, $p = .517$.

Because consumers might be more reluctant to be targeted through new strategies, and this reaction might be mitigated once they become more familiar with it, we tested to what extent experience had an impact on the relationships between informing participants and the tested responses. A Two-Way ANOVA with condition (informed vs. uninformed) and ad experience (no vs. some) as independent variables, and perceived surveillance as the dependent variable, showed – besides the earlier reported main effect of condition ($F(1, 159) = 6.07$, $p = .015$, $\eta^2 = 0.04$) – an interaction effect between whether participants were informed and their ad experience, $F(1, 159) = 5.14$, $p = .025$, $\eta^2 = 0.03$. The results showed that informing participants would only have an effect on perceived surveillance when consumers had no previous advertising experience beyond advertising exposure (Fig. 2). No direct effect of experience was found, nor were there any other significant direct or interaction effects with experience on any of the other variables from our model.

5. Discussion

5.1. Summary of findings and managerial implications

The current study examined the tensions and opportunities of new technologies in digital marketing. Specifically, we examined how informing consumers about new technologies used to personalize messages in real time, known as synced advertising, would affect their interaction with and responses to such an ad that they encounter. We discuss our results below including the implications these findings have for advertising literacy programs, marketing ethics, and marketing professionals.

5.1.1. Results and implications of consumer knowledge

The results showed that we successfully informed consumers through our website, provided insights on how consumers interact with a synced ad, and showed that informing consumers on synced advertising influences consumer responses. First, we found that informing consumers through the website helped consumers to better understand why they received the ad on their tablet and that it was related to the TV show that they were simultaneously watching. This also increased their factual knowledge of synced advertising (i.e., number of statements correct), as well as their confidence about such knowledge. Given that 'both studies' were conducted sequentially, we state that informing consumers through a website could at least lead to short term effects, but future research is needed to examine long term effects. Additionally, we choose to focus on informing consumers on the strategy of synced advertising, as it is still relatively unknown to most consumers (Boerman & Segijn 2022; Segijn & Van Ooijen 2022). As consumers become more familiar with this new tech-enabled strategy, future research could also look into the effects of informing consumers on being targeted.

⁵ The additional analysis was not preregistered, but conducted as suggested by a reviewer.

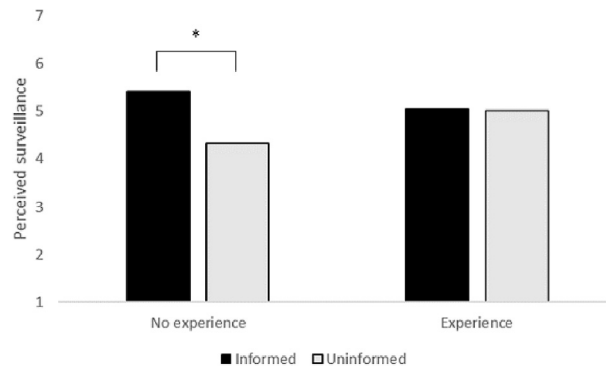


Fig. 2. Interaction effect of condition (informed vs. uninformed) and advertising experience beyond ad exposure on perceived surveillance.

The results of this study provide useful insights for the development of advertising literacy programs. Specifically, the results show that having consumers read information on a website can promote consumers' persuasion knowledge of the synced advertising strategy. This could contribute to consumers' understanding of why they receive a specific mobile ad, as well as to their objective and subjective knowledge. Previous research has found that increasing factual knowledge about new data-driven marketing strategies and confidence in such knowledge could contribute to resistance and forming critical attitudes (Segijn et al., 2023). Therefore, informing consumers on a new marketing strategy could potentially contribute to consumers as informed decision-makers, which is necessary given the information asymmetry that has arisen between entities collecting, processing, and storing data, and consumers whose data is collected (Marwick, 2012; Zarouali et al. 2022).

Furthermore, the results provide insight into what knowledge is lacking and what advertising literacy programs could focus on. For example, the statement regarding watermarking (i.e., 'Companies know what people are watching/listening to because media content (TV/radio shows) sometimes contain a sound signal that can be picked up by a mobile device.') was answered correctly by the lowest number of participants (69.9%), and participants were the least confident in their answers to this question ($M = 2.14$, $SD = 4.52$). This suggests that technologies identifying targets for synced ads would be a topic that literacy programs should focus on.

5.1.2. Results and implications of synced advertising attention and engagement

Second, we examined how consumers interacted with a synced ad, which provided important implications for digital marketers about this new data-driven marketing strategy. It should be noted that most studies on synced advertising so far have been online experiments or scenario-based experiments (Table A in Appendix for an overview), which can help us understand consumers' thoughts about how they might respond if they encounter a synced ad (hypothetical). In contrast, the current study advances the understanding of how consumers respond to such an ad when they actually encounter one. For example, by showing how quickly consumers close an ad when confronted with it, this research advances our knowledge of synced advertising and mobile marketing technologies.

One thing that stood out was that all participants almost instantly closed the synced ad as soon as they noticed it. Tablet analytics showed that the synced ad was presented to participants for an average of 6.5 s before they closed it, with 1.6 s as the quickest time. This time frame provides insights into the amount of exposure time. Eye-tracking metrics provided us further insight into visual attention (eyes-on-message). About half of the fixation duration while the synced ad was displayed (48.6%) were on the synced ad, which accounts for 1.3 s (Table C and Fig. A in Appendix). Furthermore, we found that the time to first fixation on the synced ad after its appearance was on average between 0.4 and 0.5 s, depending on whether participants directly focused on the synced ad. This was the case for 15.1% participants ($n = 26$) for whom time to first fixation was recorded. The time to first fixation can partially be explained by what participants were looking at, given that all the direct fixations were from participants already looking at the tablet when the ad appeared.

It should be noted that the results on attention are likely an underestimation of the time consumers saw the ad because participants may have seen the ad in their periphery without fixating on it. About an additional quarter (26.6%, Fig. A) of the fixation (0.7 s on average) was on the tablet in which the ad was in the peripheral. Additionally, missing data due to mobile eye-tracking errors may have reduced the actual fixation time recorded. Additionally, it should be noted that we used a tablet as a second screen rather than a phone because a larger screen would allow us to more reliably capture attention with the mobile eye-tracker. However, future researchers could study whether the type of device impacts the effectiveness of a synced ad.

These insights on attention have important managerial implications because it was proposed that synced advertising could be an effective strategy in a situation of divided attention that is now the common way that consumers are exposed to advertisements (Batra & Keller, 2016; Duff & Segijn, 2019). Attention is scarce and finding new strategies to attract the attention of the consumers is important (Duff & Segijn, 2019) because attention is the first step of the purchase funnel (Batra & Keller, 2016). Similarly, digital marketing literature on conversion rates outside of the synced advertising literature

found that consumer attention precedes subsequent advertisement clicks and potential or immediate purchase action (e.g., Bruce et al., 2017; Goić et al., 2022).

In the current study, we found that only a limited number of participants clicked on the ad (e.g., 'order now') or reported click-through intention. Although this could be explained by previous findings that showed that a high frequency and low spacing leads to the lowest click-through rate (Försch & De Haan, 2018), it is likely that this might be an artifact of a lab experiment. Our study involved an eye-tracking experiment which is more appropriate to gain insights into the upper level of the purchase funnel (e.g., attention, retention) rather than other stages of the purchase funnel (e.g., engagement, purchases). Future research is needed to look into conversion rates related to synced advertising. Case studies done by the industry already showed promising results. For example, a synced advertising campaign with Nissan in the UK and France showed a 96% brand uplift and compared to a campaign with TV alone, a synced advertising campaign led to a 39% increase in brand uplift (Wywy, 2015). Future research with a different design or method (e.g., field experiment, observation study, case study) is warranted to further examine the economic effects and behavioral outcomes, such as whether consumers would click on a link to get to the advertisers' website or whether they would purchase the products based on a discount offer. These future studies could utilize various other metrics measuring attention (e.g., in-view time, exposure rate) and empirically demonstrate connections between engagement and purchase metrics (e.g., hover rate, touch rate, sales; Jędrocha, 2022) to get a further understanding of the effectiveness of a synced advertising campaign.

5.1.3. Results and implications of memory

Third, we examined the effects of informing consumers on how they respond to the synced ad. We proposed a cognitive path, explaining the results of informing consumers on product, brand, and ad memory through attention, as well as an affective path, explaining how providing consumers with information about synced ads can affect consumers' brand attitudes through perceived surveillance. We found that informing consumers leads to a higher product recall on TV and recalling the same brand on both screens. This is important managerial information because a recent report from Nielsen showed that among the five critical drivers for campaign success in emerging media, brand recall is the most important as it influences nearly 40% of brand lift (Nielsen, 2023).

5.1.4. Results and implications of perceived surveillance

Fourth, we found that informing consumers on synced advertising leads to more perceived surveillance, which is in line with the findings of Segijn et al. (2023) that showed a similar relationship in a scenario-based experiment. Considering that the nature of the manipulation in a scenario-based experiment could have affected people's perceptions of surveillance in Segijn et al.'s study (2023), replicating these results in this lab experiment makes us more confident about the robustness of this finding. Moreover, additional analyses showed that the effect of informing consumers on perceived surveillance was only true for consumers who had no experience with the advertising beyond advertising exposure (e.g., through education, work experience). Experienced consumers have high levels of perceived surveillance regardless of the information provided, which could indicate a ceiling effect. This finding goes against the predictions consumers reluctance to new strategies might be mitigated once they become more familiar with it. Future research is necessary to further examine this claim in the context of synced advertising and to test whether this effect changes over time as consumers become even more familiar with it.

These results have important implications for marketing ethics. Questions arise on how to implement data-driven marketing strategies in an ethical way. Previous research has found a link between perceptions of surveillance and individual's privacy (Southerton & Taylor, 2020) and autonomy (Büchi et al., 2022). For example, when consumers feel they are being watched, they may self-censor what media they consume (Büchi et al., 2022). The result that synced advertising is linked with high levels of perceived surveillance, warrants future research to examine how perceived surveillance because of synced advertising affects privacy concerns or chilling effects.

Contrary to our prediction, perceptions of surveillance did not impact brand attitudes. An additional analysis showed a positive correlation between perceived surveillance and memory ($r = 0.31, p < .001$). Thus, more perceived surveillance leads to more overall memory or vice versa. This may indicate that perceived surveillance makes consumers more alert, and therefore they will better remember the product, brand, and ad. Alternatively, more memory of the synced product, brand, or ad would increase their perceived surveillance. Future research is needed to further examine this unexpected result.

5.1.5. Results and implications of non-significant findings

Finally, no significant relationship was found between informing (vs. not informing) consumers on synced advertising and attention to the synced ad, brand memory (e.g., recall and recognition of the brand), and brand attitudes. That we did not find an effect on brand memory and attitudes could be explained by how fast participants closed the ad. Given that we used an unfamiliar brand, this might not have been enough time to consciously process the brand but only to process the advertised product. Therefore, future research should also investigate implicit measures of brand memory and attitudes designed to gain insights about unconscious processing (Vandenberg, Murre, Voorveld, & Smit, 2015) because the short amount of exposure to the ad on the tablet and the divided attention task could hinder or eliminate successful explicit processing (Shapiro & Krishnan, 2001).

These findings reveal beneficial managerial implications for digital marketers, because we find no (negative) impact of consumers on synced advertising on brand attitudes. However, consumers seem to quickly close the ad, which limits the

exposure duration and potential for consequent effects (e.g., brand attitudes). The result that consumers quickly close the mobile ad suggests that marketers may need to think of other types of mobile ads that are less intrusive and perhaps not as easy to close, such as an ad that does not pop up or a native ad. However, despite the brief duration of ad exposure, the advertised product was better recalled by consumers informed on this new marketing strategy, compared to uninformed consumers.

5.2. Theoretical implications

Besides managerial implications, the results of the current study have important theoretical implications. First, our study contributes to the literature on digital literacy by showing that informing consumers through a website could contribute to their (short term) understanding of new digital marketing strategies. Previous studies have found mixed results on the effectiveness of informing consumers about data collection practices for marketing purposes (Segijn et al. 2023; Strycharz et al., 2019, 2021). Extending the findings of previous studies, the current study directly tested the effect of digital literacy on synced ad effectiveness and consumers' responses to the synced ad, confirming the positive effect on product recall and perceived surveillance. Second, the results of the current study contribute to theory by examining direct and indirect effects of synced advertising, and evaluating to what extent these effects differ depending on whether consumers are informed about this strategy or not. We found that informing consumers about synced advertising increases their recall of the advertised product. These results provide some preliminary evidence for the idea stemming from the persuasion knowledge model that informing consumers about synced advertising draws their attention to (aspects of) the synced ad. Additionally, our study provides evidence for two distinct, relevant paths: a cognitive and an affective path.

5.3. Conclusion

To conclude, by investigating the intended and unintended effects of synced advertising as a new data-driven marketing strategy, this study showed the tensions and opportunities of new technologies in digital marketing. Specifically, the results confirm that synced ads are effective in promoting consumers' memory about the advertised products, and also show that informing consumers about synced advertising does not backfire. Therefore, this study suggests that ethical discussions should be held by digital marketers surrounding informing consumers about new advertising strategies, such as synced advertising, as well as the ethical implications of collecting, processing, and storing consumer data.

Data availability

Data will be made available on request.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary material

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.ijresmar.2023.07.001>.

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