How Advertorials Deactivate Advertising Schema: MTurk-Based Experiments to Examine Persuasion Tactics and Outcomes in Health Advertisements

Sunny Jung Kim¹ and Jeffrey T. Hancock²

Abstract
Advertorials—advertisements camouflaged as editorial material—are a pervasive advertising strategy. Presentational features of advertorials, such as a small or omitted advertisement label and useful information presented in an editorial format prior to promoting a product, are likely to give impressions to readers that the reading material is a useful resource rather than advertising material. We examined the cognitive and persuasive effects of health product–related advertorials based on a schema-laden information processing model framework. Study 1 (n = 337) found that advertorials were less likely to trigger advertising schema, especially consumer awareness of persuasive intent. Study 2 (n = 336) found that the structure presenting useful information before advertising a related product decreased consumer skepticism. Overall, readers exhibited more positive attitudes toward advertorials than they did toward traditional advertisements due to decreased awareness of persuasive intent (Study 1) and advertorials’ structure (Study 2), which, in turn, increased willingness to purchase advertised products.

Keywords
persuasion, advertorials, advertising schema, Amazon Mechanical Turk, lexical decision tasks

¹Dartmouth College, Lebanon, NH, USA
²Stanford University, Stanford, CA, USA

Corresponding Author:
Sunny Jung Kim, Center for Technology and Behavioral Health and Dartmouth Psychiatric Research Center, Department of Biomedical Data Science, Geisel School of Medicine at Dartmouth, 46 Centerra Parkway, Lebanon, NH, 03766, USA.
Email: sunny.j.kim@dartmouth.edu
Persuasion is the key driver in marketing and advertising. A twist on the traditional advertisement, the advertorial is a direct-to-consumer advertising format disguised as a credible editorial or news article. Though seemingly just a helpful source of information, advertorials are, in fact, created by advertisers on behalf of content sponsors to create a favorable marketing climate to advertise a sponsored product (Eckman & Lindlof, 2003). The advertorial is pervasively used in health and wellness marketing campaigns (Erjavec & Poler Kovacic, 2010), with a national survey reporting that advertorials often increase the readership and believability of such advertisements. For the consumer, however, advertorials are a misleading form of advertising practice. Section 5 of the Federal Trade Commission Act (FTC Act) states deceptive advertising practice as “a representation, omission or practice that is likely to mislead the consumer” acting reasonably in the circumstances (Federal Trade Commission (FTC), 2002, p. 1). Researchers have called advertorials “a disturbing trend” (van Reijmersdal, Neijens, & Smith, 2005, p. 39) and a “source of information pollution” (Cameron, Ju-Pak, & Kim, 1996, p. 723).

Because of their design, structure, and content (Cameron & Ju-Pak, 2000), advertorials tend to sway readers into believing that they are viewing credible content in the form of an editorial or news source (van Reijmersdal et al., 2005). As a result, consumers show increased attention levels and memory retention relative to traditional advertising with a more explicit sales message (Cameron et al., 1996; Dix & Phau, 2009; Kim, Pasadeos, & Barban, 2001; van Reijmersdal et al., 2005). These enhanced persuasive effects explain why the advertorial format has become a widely adopted marketing tactic and an increasingly effective alternative to conventional advertising (Kim et al., 2001). It is not clear, however, how advertorials create favorable marketing environments for advertisers, and how readers process advertorials. The present study asks two key questions regarding the information processing of advertorials. First, how are specific communication cues in health advertorials cognitively processed relative to those in typical advertisements? Second, why are these specific cues of the advertorial format more persuasive?

The present study examines these questions by looking at the role of two distinct elements in advertorials: labeling and message structure. Study 1 tests whether labeling an advertorial with the term “Advertisement” enhances the processing of the advertorial as being an advertisement or containing persuasive intent. Study 2 tests whether the structure of information, such as presenting useful information first followed by an advertisement or vice versa, produces different perceptions about the advertorial content that affects consumer attitudes and purchase decisions. Both studies use a lexical decision task (LDT) to investigate how people process advertorials. The LDT indirectly assesses spreading activation of a target concept (Storbeck & Robinson, 2004), and is a common methodological paradigm that measures the automatic cognitive processes of target category identification (Baldwin, Fehr, Keedian, Seidel, & Thomson, 1993).

**Labeling Effects**

To reduce the confusion that can arise from erroneously interpreting advertorials as independent editorial content, the American Society of Magazine Editors (ASME) updated industry guidelines in 2013 to differentiate advertorials from editorial or news
content. One of these recommendations is the explicit labeling of an advertorial as an “Advertisement” at the top of each related page. The presence of a label in an advertorial is assumed to signal its commercial intent, making it easier for readers to identify advertorials as advertisements rather than editorials. Research suggests, however, that approximately one third of advertorials do not have advertising labels, and only about one fifth of the labels follow ASME’s advertorial guidelines, such as page headers and the use of larger font size for labeling relative to body font (Cameron & Ju-Pak, 2000).

Structure Effects

Another element of advertorials that creates a false impression about the content is the message structure. Advertorials start with useful health information incorporating editorial nuances before introducing advertising statements to sell a sponsored product or service. Its structure is likely to influence the typical consumer’s response to a regular advertisement and misrepresent the fact that the advertorial content is controlled by the sponsor. In one study, about one fourth of participants incorrectly classified an advertorial as editorial content because of “their overall impressions of the wording and the amount of information conveyed” in the beginning of the content (Wilkinson, Hausknecht, & Prough, 1995, p. 253). To reduce confusion associated with the structural effect of advertorials, ASME’s “Advertising Adjacencies” rule states that advertisements should not be presented near editorial messages that present a related agenda, implying that starting with useful information in advertorials can obscure persuasive marketing intent.

Advertising Schema

In order to test and understand the effects of labeling and advertorial structure, the present study draws on the concept of schema activation (Eisend & Küster, 2010; Goodstein, 1993; McDaniel & Heald, 2000; Stoltman, 1991). Psychologists at the beginning of the 20th century (e.g., Oldfield & Zangwill, 1942) introduced Kant’s schema concept as a useful cognitive notion that can explain how people understand a stream of information. Schemas are organized memory systems that enable a person to focus on relevant stimuli, make inferences, assign meaning to a stimulus, organize the information in memory for later use, and facilitate a coherent response toward the stimulus (Cheong & Kim, 2011).

Schema formation is based on pieces of information from various sources, such as the media and personal experience (Fiske & Linville, 1980). The relevant schema must be activated at the reference moment of encoding the stimulus. When the incoming information in the stimulus is incongruent with the target schema, new incoming information can be poorly stored or easily distorted in a person’s knowledge structure. In the case of advertorials, for example, they can be incongruent with people’s general knowledge about advertisements because of their atypical appearance and format. Thus, the advertising schema may not be automatically activated while encoding advertorials.

The notion of advertising schema was first introduced in the context of communication by Stoltman (1991), who proposed that a person’s advertising schema develops
through repetitive exposure to advertising stimuli. When an advertising schema is activated, it facilitates (1) the organization of new information from advertisements in relation to advertising stimuli stored in a person’s memory; (2) the identification of marketing attempts in advertising material; and (3) the execution of a purposeful response to the advertisement (Hoch, 2002; Stafford & Stafford, 2002; cited by Dahlen & Edenius, 2007).

Then, are advertorials, which are camouflaged advertisements, persuasive because they circumvent the advertising schema? In two experiments, the present study uses an LDT to investigate how advertorials trigger, or avoid triggering, advertising schema-related concepts, such as persuasion. In a typical LDT, participants are presented with a string of letters on a computer screen and asked to determine whether each string is a word or non-word as quickly and accurately as possible (Baldwin et al., 1993). The strings presented in the LDT include target schema–related words (i.e., target words), target-schema unrelated words (i.e., neutral words), and non-words (i.e., decoys). The shorter the reaction time toward target schema–related words relative to neutral words, the stronger the activation of the target schema (Fazio & Olson, 2003). For example, if strongly primed with the concept of persuasion after viewing an advertorial, a person will have faster LDT latency responses toward persuasion-related words compared with when they are not primed with the concept of persuasion. That is, the latency responses from LDT tasks indicate schema accessibility.

The first experiment examines to what extent an advertorial, with or without advertisement labeling, can bypass the typical cognitive response toward advertising, whereas the second experiment examines the effect of an advertorial message structure, specifically whether editorial information presented prior to a promotional message reduces the activation of advertising schema-related concepts.

**Study 1**

*Advertising Schema Activation and LDTs*

The first experiment examines whether persuasion intent is more obvious in regular advertisements versus advertorials. If so, traditional advertisements should trigger an advertising schema more rapidly than advertorials, especially unlabeled ones. Study 1 presented two advertising schema-related concepts as target word groups in an LDT: (1) target nouns semantically related to advertisements and (2) target verbs (or gerunds) semantically related to persuasion. Shorter reaction times indicate stronger activation of the target concept (Fazio & Olson, 2003). Thus, the following hypothesis is proposed:

**Hypothesis 1 (H1):** Participants exposed to regular advertisements should have faster LDT response rates for (a) advertising-related words and (b) persuasion-related words than participants who are exposed to unlabeled advertorials.

Although there is no consensus on what attributes are necessary to activate a particular schema (McDaniel & Heald, 2000), labeling guidelines imply that labels should alert readers to marketing intent. Study 1 tests whether a label triggers the advertising
schema. It follows that if an advertising label activates advertising schema, participants exposed to a labeled advertorial will respond faster to advertising schema-related words than those who are exposed to an unlabeled advertorial:

**Hypothesis 2 (H2):** Participants exposed to labeled advertorials will have faster LDT response rates for (a) advertising-related words and (b) persuasion-related words than participants who are exposed to unlabeled advertorials.

**An Information Processing Model for Advertorials**

The activation of an individual’s advertising schema should initiate and guide a series of cognitive processes that reflect persuasion pathways. Given this particular assumption, an information processing approach should be useful in understanding attitudinal and behavioral reactions to advertorials. In line with this approach, we propose a schema-laden information processing model that incorporates cognitive responses toward advertorials implicitly measured by LDT, category affect toward health advertisements, and related attitudinal and behavioral intention responses.

Category affect refers to a pre-existing affective state with regard to a particular stimulus category that can influence judgments of that category (Forgas, 2008). A consumer’s category affect toward health advertising may be negative or positive, depending on their experience with health advertisements. The affective response may be negative due to a constant exposure to the advertisement-saturated environment (Dahlen & Edenius, 2007; Elliott & Speck, 1998), or positive given the usefulness of direct-to-consumer health advertisements that can enhance positive patient-doctor communication and disseminate useful health information (Donohue, Cevasco, & Rosenthal, 2007; Gellad & Lyles, 2007; Pharmaceutical Research and Manufacturers of America [PhRMA], 2008). A negative category affect facilitates avoidance, whereas a positive category affect fosters engagement and the recall of processed advertisements (Goodstein, 1993).

Attitudes and category affect toward health advertisements can be reliable indicators of behavioral intention to adopt the advertising recommendations (Fazio & Olson, 2003; Petty & Cacioppo, 1981). When an individual’s advertising schema is not activated (i.e., the individual is not cognizant of persuasion intent), which is most likely after reading an unlabeled advertorial, and she/he demonstrates a neutral or positive category affect toward health advertisements, then their attitude toward the message is likely to be positive and show increased behavioral intention to adopt the advertising recommendation in the message. On the other hand, if category affect toward health advertisements is strongly negative from the outset, the individual’s attitude toward the stimulus advertisements may also be negative and show decreased behavioral intention to adopt the advertising recommendation in the message.

**Hypothesis 3 (H3a):** Slower LDT responses toward target group words resulting from viewing unlabeled advertorials and a positive category affect will predict positive attitudes toward messages.
**Hypothesis 3 (H3b):** Increased positive attitudes toward messages will lead to increased behavioral intention.

**Methods**

**Procedure.** Participants were recruited through Amazon Mechanical Turk (MTurk), an online crowdsourcing labor market where requesters distribute tasks and anonymous workers complete tasks for compensation. MTurk has been rapidly adopted for research purposes because the interface allows researchers to recruit diverse populations that are fairly representative of the internet-using population (Horton, Rand, & Zeckhauser, 2011; Mason & Suri, 2012; Paolacci, Chandler, & Ipeirotis, 2010). For the present study, MTurk workers were first presented with informed consent and those who agreed to participate in the study were re-directed to a virtual experiment hosted on an external server. The interface for this virtual experiment, created with Adobe Flash Professional CS5, was downloaded locally on each participant’s computer so that internet speed did not affect the accuracy of LDT reaction times. In order to be eligible for this experiment, only native English-speaking MTurk workers residing in the United States were recruited.

**Experimental conditions.** The experiment had three conditions: the regular advertisement condition, the labeled advertorial condition, and the unlabeled advertorial condition. Each condition covered two health topics: healthy eating and healthy sleeping. Each topic included four different advertising products resulting in 24 stimulus materials in total (3 conditions × 2 health topics [healthy eating, healthy sleeping] × 4 product advertisements).

In the virtual experimental interface, participants were first asked to read brief instructions and to practice six LDT trials. They were then randomly assigned to one of the 24 stimulus materials. The interface was programmed to have a maximum of 35 randomly assigned participants for each stimulus, and equally distribute them across the 24 messages. Participants were instructed to read the stimulus material carefully and click on the “NEXT” button when finished. We also asked participants to write a summary of what they read to ensure participants carefully read the stimulus material. The “NEXT” button appeared after 30 seconds so that participants were not able to proceed until 30 seconds had elapsed. After viewing the stimulus material, participants completed an LDT and answered a series of questionnaires measuring behavioral intention, message attitudes, and category affect. Following the questionnaires, they submitted their MTurk ID for verification to receive compensation.

**Stimulus materials.** In order to generate stimulus materials, we collected both regular advertisements and advertorials for an array of products related to healthy eating and sleeping (e.g., soy-based foods, nasal strips). Following the methodology of Kim et al. (2001), when a product was marketed in an advertorial format only, we created a regular advertisement based on the core elements presented in the advertorial, such as key phrases, visual presentation, and titles (see Appendix A for stimulus materials). The
delivered content in labeled and unlabeled advertorials was identical except for the addition of the “Advertisement” label placed in the top center of the materials, consistent with ASME’s labeling guidelines.

**LDT approach.** Immediately after viewing the randomly assigned stimulus material, participants completed an LDT in which they were instructed to classify strings of letters on the screen as English words or non-words as quickly as possible, while striving for at least a 90% accuracy rate (Bushman, 1998). They were asked to position their index fingers on the “D” and “K” keys of their keyboard, and to press the “D” key when a non-English word appeared and the “K” key when an English word appeared on the screen. In each trial, the fixation cue “*” was presented for 500 milliseconds on the center of the screen and then replaced by a lowercase string of letters. Each string of letters remained on the computer screen until each participant hit the “D” or “K” key, or until a maximum of two seconds had passed (Perea, Rosa, & Gómez, 2002). Participants received a different random order of 48 strings in their LDT. Both accuracy and reaction time (in milliseconds) were recorded after each trial.

The LDT strings of letters were comprised of three types of word formations: (1) 12 target words (either advertisement-related nouns or persuading-related verbs and gerunds); (2) 12 neutral words; and (3) 24 non-words (see Appendix B for LDT strings). The development of the LDT strings followed standard procedures (e.g., Katz et al., 2012; Perea et al., 2002). To create a list of target words, Lexical FreeNet, a widely implemented word generator tool, was used to search for conceptually and semantically related target words. Lexical FreeNet allows users to search for a list of synonymous or antonymous words to a target based on the target’s rhyme, concepts, or semantic relationships. In order to select a representative set of neutral words that are consistent with the standard procedures of LDT experiments, the number of letters and frequency levels for the neutral words were matched to the corresponding target words according to the English Lexical Project Web database, which indexes English vocabulary and contains more than 40,000 words, along with their length and frequency of use. For example, to select a 13-letter neutral word that matched the frequency rank of the 13-letter target word “advertisement” (frequency rank = 3,924), the word “investigating” (frequency rank = 3,983) was selected.

Following standard LDT procedures, 24 non-words were selected by taking words within high-frequency ranks (frequency mean = 348; range = 140-998) and changing an interior letter (e.g., “think” to “thunk” in which the interior letter “i” was changed to “u”) but maintaining a word still readily pronounceable by native English speakers (see Appendix B for a full list of target words, neutral words, and non-words).

**LDT data cleaning.** The preparation for LDT data analyses included several steps of standard procedures: (1) considering the first three LDT responses among the 48 trials as practice and consequently excluding them in the data analysis (Storbeck & Robinson, 2004); (2) excluding the 24 non-word strings (decoys) from the data analysis; and (3) replacing latency responses that were two standard deviations below (38.2 milliseconds) and above (1,562.5 milliseconds) the grand mean ($M = 800.36, SD = 381.07$);
with these points, resulting in a total of 7,159 trial responses. Among those 7,159 responses, 3,584 were latency responses toward the 12 target words, and 3,575 were latency responses toward the 12 neutral words. The LDT latency responses were averaged across (1) target nouns semantically related to advertisements (e.g., banner, advertisement, commercial, and product) and (2) target verbs or gerunds semantically related to persuade (e.g., convince, influence, marketing, persuade, promote, advertising, and purchase). This classification taps specific sub-concepts of advertising schema that should be activated by reading an advertorial, and allows us to differentiate the concept of an advertisement versus the act of persuading.

Self-Report Questionnaire. Behavioral intention was measured with four items assessing the participants’ likelihood of adopting suggested behaviors (e.g., buying the advertised product). Each of the items was rated on a 4-point scale, with the larger values indicating a greater likelihood of adopting the targeted behaviors. Attitudes toward the message were measured with a pre-validated 7-point semantic differential scale (MacKenzie & Lutz, 1989). An established scale capturing category affect was adopted (Goodstein, 1993; $\alpha = .93$) and adjusted to fit the context of the study. All of the items utilized in the structural equation modeling are reported in the results section.

Results

Participants. There were 337 MTurk workers in total ($N_{\text{reg.ad}} = 124$; $N_{\text{labeled advertorials}} = 110$; $N_{\text{unlabeled advertorials}} = 103$), with 56% classified as male. The average age was 31.5 years old ($SD = 11.58$), with a quartile range between 23 to 37 years old. The sample (N = 337) consisted of White ($n = 263$, 78%), Asian ($n = 47$, 13.9%), African American ($n = 22$, 6.5%), Hispanic/Latino ($n = 16$, 4.7%), American Indian or Alaska Native ($n = 3$, 0.9%), and Native Hawaiian or other Pacific Islander ($n = 1$, 0.3%).

LDT results for schema activation. The first hypotheses predicted that regular advertisements are more likely to activate schemas associated with the concept of advertisement (H1a) and persuasion (H1b) than advertorials. Independent-sample $t$ tests comparing LDT mean scores for advertisement-related words between the regular advertisement condition ($M = 637.68$, $SD = 184.18$) and the unlabeled advertorial condition ($M = 619.70$, $SD = 193.47$) were not significantly different, $t(225) = 1.07$, $p = ns$, suggesting that advertorials did not slow the activation of schema associated with the concept of advertisement. H1a was not supported (Figure 1).

In contrast, persuasion-related words generated faster LDT responses from participants after viewing a regular advertisement ($M = 606.43$, $SD = 174.76$) than after viewing an unlabeled advertorial ($M = 672.59$, $SD = 144.09$), $t(225) = 3.11$, $p = .005$, Cohen’s $d = .41$, supporting H1b and suggesting that unlabeled advertorials reduce the activation of persuasion concepts. The latency scores for the 12 neutral words were not significantly different between the regular advertisement condition ($M = 722.53$, $SD = 150.62$) and the advertorial condition ($M = 751.74$, $SD = 139.82$), $t(225) = 1.50$, $p = ns$, suggesting that the regular advertisements and advertorials did not affect the activation of concepts unrelated to advertisement or persuasion (Figure 1).
H2a and H2b predicted that participants exposed to labeled advertorials would respond faster to advertisement- and persuasion-related words than those who were exposed to unlabeled advertorials. The LDT latency responses for advertisement-related words were not significantly different between the labeled advertorial condition ($M = 628.97, SD = 147.01$) and the unlabeled advertorial condition ($M = 619.59, SD = 193.47$), $t(211) = .32$, $p = ns$. H2a was thus not supported. However, responses to persuasion-related words were faster after reading labeled advertorials ($M = 634.09, SD = 131.69$) than those exposed to the same advertorials without a label ($M = 672.59, SD = 144.09$), $t(211) = 2.06$, $p < .05$, with a small magnitude in the effect size (Cohen’s $d = .28$), supporting H2b (Figure 1).

**Figure 1.** Mean LDT latency scores for the target advertising nouns, persuasion verbs, and neutral words across conditions.  
*Note.* Higher scores represent slower responses to the word type. Bars show ± one standard error. LDT = lexical decision task.

Pathways from advertisement exposure to persuasive outcomes. In testing the persuasive pathway of processing advertorials (H3a and H3b), the two-step procedure of Structural Equation Modeling (SEM) was used (Anderson & Gerbing, 1988). The full structural path model predicts that (1) slower LDT responses toward target group words (less activated advertising schema), which are likely to be observed among unlabeled advertorial viewers relative to regular advertisement or labeled advertorial viewers, and (2) positive category affect are likely to yield positive attitudes toward messages. Further, increased positive attitudes toward messages will lead to increased behavioral intention to adopt the promoted behavior.
Measurement model. Prior to examining the association between cognitive response and persuasion outcome in processing advertorials, a measurement model was first tested. Guided by the previous t-test results, standardized values for LDT latency scores for persuasion-related words (e.g., promote, publicize, advertising, and purchase) that generated the largest t-statistics with mean differences across conditions were implemented in the measurement model to form a latent construct of LDT latency responses (Figure 2) instead of using all 12 target words. This satisfies the minimum number of manifest variables of three per latent construct while reducing the number of parameters to be measured. This selective approach also leads to more stable estimates and better model fit (Hoshino & Bentler, 2013).

All of the following manifest variables were based on the self-report scales, and some of the items were reverse coded prior to measurement modeling so that greater scores always indicated greater positive category affect, positive attitudes toward the stimulus messages, and greater behavioral intention to adopt a suggested behavior in the messages.

The latent construct of category affect was measured by four manifest variables such as, “I like online ads for (healthy sleeping/healthy eating) very much,” “it’s very easy to dislike online ads for (healthy sleeping/healthy eating),” and “when I notice...”
that an online ad is for (healthy sleeping/healthy eating), I am quick to shift my attention away from the ad.”

Manifest variables for the latent construct of attitudes toward message included five semantic differential measures such as (1) useless-(7) useful, (1) unpleasant-(7) pleasant, (1) unfavorable-(7) favorable, (1) unenjoyable-(7) enjoyable, and (1) misleading-(7) truthful. Manifest variables for behavioral intention include “how possible is it that you will purchase the product mentioned in the message?”, “if you can request a sample trial of the product mentioned in the message, how likely is it that you will request a sample trial?”, “do you think you will purchase the product mentioned in the message at any time in the next 30 days?”, and “how likely is it that you will ask for a sample trial of the product mentioned in the message?” The final measurement model achieved a good fit, $\chi^2(110,337) = 211.12$, $\chi^2 / df = 1.92$, goodness of fit index (GFI) = .93, normed fit index (NFI) = .93, comparative fit index (CFI) = .96, root mean square error approximation (RMSEA) = .05, standardized root mean residual (SRMR) = .07 (Figure 2).

**Full model.** The initial full model was based on the conceptual relationships presented in H3a and H3b, $\chi^2(144,337) = 268.02$, $\chi^2 / df = 1.86$, GFI = .93, NFI = .91, CFI = .96, RMSEA = .05, SRMR = .08. The initial model fit indices indicated a moderate fit to the data and were penalized for an insignificant path. In the process of model modification, a path from category affect to LDT responses was dropped ($\beta = .02, p = ns$), and a direct path from category affect to behavioral intention was added to the final full model (Figure 2). The final model fit indices confirmed a good fit to the data, $\chi^2(144,337) = 250.08$, $\chi^2 / df = 1.74$, GFI = .93, NFI = .92, CFI = .96, RMSEA = .05, SRMR = .07, and all the path coefficients were statistically significant.

The final model indicates that participants were more likely to adopt a suggested behavior when their attitudes toward the stimulus advertisements were positive and had positive category affect toward health advertising in general. In particular, positive attitudes toward advertising messages were predicted by slow LDT latency responses that resulted from unlabeled advertorials (.18 × .43 = .08). This pathway was weaker for labeled advertorials (.18 × .27 = .05). Overall, when advertising schema was bypassed (i.e., longer LDT latency responses), attitudes toward advertising messages were more likely to be positive toward advertising messages and lead to greater behavioral intention to adopt a promoted behavior in the messages.

**Discussion**

Study 1 fused cognitive responses toward advertorials measured by LDT to an information processing model, and found that attenuated activation of advertising schema explained favorable attitudes toward advertising messages and increased purchase intention. Unlabeled advertorials, more than labeled advertorials and regular advertisements, produced longer LDT latency responses toward persuasion-related words, indicative of less active advertising schema. After reading advertorials, people were primed by the concept of persuasion but not the concept of advertisement. This pattern suggests that the goals of an advertorial, namely to persuade readers about a product but without appearing as an advertisement, were largely successful.
Study 2

The second experiment examines the effect of message structure on the cognitive processing of advertorials. Health advertorials typically provide useful health information before advertising a product or service. ASME’s guidelines prohibiting adjacency advertising tactics imply that marketers can benefit from a simple manipulation of a message’s structure (Buda & Zhang, 2000; Haugtvedt & Wegener, 1994; Lana, 1961). This structure of advertorials is often criticized as a deceptive marketing tactic that ameliorates people’s skepticism and selective acceptance of an advertisement (Kim et al., 2001). Study 2 tests this possibility by examining whether readers lower their skepticism toward advertorials and find the content informative or deceptive. In doing so, we manipulate the same advertorial content that either (1) first provides health information followed by an advertisement section (referred to as info-first advertorials) or that (2) first presents advertisement sections prior to providing health information (ad-first advertorials).

The aim of Study 2 is twofold: First, does an advertorial message structure affect the activation of advertising schema-related concepts, in particular the concepts of skepticism and deception? The late introduction of advertising content after useful health information may incite perceptions of misleading marketing tactics. Second, does message structure yield changes in attitudes toward the viewed advertisement or behavioral intentions toward a product? Attitudes and behavioral intentions toward the advertising message may change depending on whether readers sense an element of skepticism or deception as a result of reading an advertorial.

Psychological Underpinnings of Advertorial Structure

The way readers respond to advertising messages is subject to the presentational order of the message (Buda & Zhang, 2000; Haugtvedt & Wegener, 1994; Lana, 1961). Readers tend to react strongly to a first stimulus with enhanced persuasion outcomes, such as brand awareness and positive attitude formation, reflecting a primacy effect (Murphy, Hofacker, & Mizerski, 2006). Under the influence of primacy effects, readers weigh information presented first more heavily, and make final decisions based on the impression formed at the beginning.

We apply the framework of primacy effects (Buda & Zhang, 2000) to see how it interacts with advertorial structure. According to primacy effects, the information presented first in an advertorial is likely to influence how people process the content as a whole: If readers find the first section of the advertorial valuable and helpful for their health concerns, participants in the info-first advertorial condition may have little skepticism. Different from the FTC’s definition of deceptive advertising practice applicable to advertorials, readers may not find the advertorial to be misleading due to the informative content attained in the beginning. We aimed to test whether or not people associate the reading material with skepticism or deception to understand the effects of the message structure of advertorials.

Hypothesis 1 (H1): Participants exposed to info-first advertorials will have longer LDT latency response rates for a) skepticism-related words and b) deception-related
words than participants who are exposed to ad-first advertorials or regular advertisements.

**Structural Effects and Persuasion Outcomes**

In line with Study 1 procedures, we incorporate persuasion outcomes (e.g., attitudes toward messages) and a covariate (e.g., category affect) into the information processing model. The relationship between target schema–related concepts (skepticism and deception) and the category affect was utilized to inform predictions about subsequent attitude formation and behavioral choice. Audiences tend to have positive attitudes toward editorial messages, and perceive them to be highly credible (Salmon, Reid, Pokrywcynski, & Willett, 1985). Because an advertorial delivers useful health information in an editorial manner prior to advertising a related product, readers may form positive perceptions toward the messages in the beginning, which may spill over to the adjacent advertisement (Obermiller, Spangenberg, & MacLachlan, 2005). If this unique structure in an advertorial enhances readers’ attitudes toward the advertisement without notifying them that the entire content was controlled by an advertising sponsor for marketing benefit, the advertised product may have a better chance of being perceived as a solution to health issues addressed in the beginning and would thus become more acceptable to the readers. Given these possible persuasion effects but lacking evidence of the effects of advertorial structure in information processing contexts, we cast the following research question to explore how these constructs ultimately influence persuasion outcomes:

**Research Question 1 (RQ1):** How will info-first advertorials and ad-first advertorials, compared with regular advertisements, lead to different attitudes toward messages and behavioral choices in relation to LDT latency responses and category affect?

**Methods**

**Study procedure.** Study 1’s online interface and procedure were adopted for Study 2. Embedded HTML scripts prevented MTurk workers who participated in Study 1 from participating in Study 2. As in Study 1, participants engaged in the LDT exercise, viewed a stimulus material, and completed the LDT followed by the self-report items. The design involved three groups (regular ad-only, ad-first advertorial, and info-first advertorial conditions) with two health topics (healthy eating and healthy sleeping) and four different product advertisements under each topic, leading to 24 stimulus materials in total (3 conditions × 2 health topics × 4 product advertisements).

**Stimulus materials.** An array of advertorials and advertisements were collected from media sources to generate the stimulus materials for Study 2. Each advertorial contained both a text-based information section focusing on healthy eating or sleeping and an advertising section presenting visuals with advertising captions. The delivered information on healthy eating and sleeping was similar to the information used in Study 1. Using visual editing programs, we separated and placed informational content before advertising content for info-first advertorial stimuli, and placed advertising
sections ahead of informational sections for ad-first advertorial stimuli. Except for this experimental manipulation in structure, the messages and conveyed information were identical. Advertising-only sections were used as regular advertisements (see Appendix A for sample stimulus materials).

**LDT string development for Study 2.** The target-schema concepts to be measured from the LDT were “skepticism” and “deception” and LDT strings were developed with the same procedure described in Study 1. The target words “skeptical” and “deceptive” were entered into the Lexical FreeNet program to find semantically related strings. Twelve target words, 12 neutral strings, and 24 non-word strings were generated (see Appendix B for LDT strings). The LDT data cleaning procedure and analytic approach from Study 1 were applied to the LDT data in Study 2. Skepticism-related words (e.g., skeptical, suspicious, sneaky, tricky) were averaged into a **skepticism LDT index** (Cronbach’s $\alpha = .71$). Deception-related words (e.g., deceit, deceive, deceptive, dishonest, misleading) were averaged together into a **deception LDT index** (Cronbach’s $\alpha = .74$).

**Results**

**Participants.** Three hundred and thirty-six MTurk workers participated in the experiment ($N_{reg.ad} = 116$; $N_{info-first advertorials} = 107$; $N_{ad-first advertorials} = 113$), with 57.4% classified as female participants. The average age was 31.87 years old ($SD = 12.10$; the first quartile = 23, and the third quartile = 37). In Study 2, the majority of the sample was White ($n = 268$, 79.8%), followed by other ethnicity groups, including 9.2% being Asian ($n = 31$), 7.7% of African American ($n = 26$), 6.5% of Hispanic/Latino ($n = 22$), 2.1% of Native Hawaiian or other Pacific Islander ($n = 7$), and 1.5% of American Indian or Alaska Native ($n = 5$).

**Advertorial structure effects on LDT response rates.** Recall that participants exposed to info-first advertorials were predicted to display longer LDT response rates for skepticism-(H1a) and deception-related (H1b) words than those exposed to ad-first advertorials or regular advertisements. The latency responses to the skepticism LDT index revealed that participants exposed to info-first advertorials displayed longer LDT response rates for skepticism-related words ($M = 769.84$, $SD = 161.92$) compared with regular advertisements ($M = 717.32$, $SD = 163.43$), $t(221) = 2.28$, $p = .02$, Cohen’s $d = .32$, but not significantly longer compared to ad-first advertorials ($M = 745.64$, $SD = 144.13$), $t(218) = 1.22$, $p = ns$; Figure 3), providing partial support for H1a. Response time to the deception LDT index revealed no significant difference between the info-first advertorial ($M = 775.41$, $SD = 163.41$) and the regular advertisement condition ($M = 747.41$, $SD = 164.95$), $t(221) = 1.00$, $p = ns$, nor was the difference between the info-first and ad-first advertorial conditions significant ($M = 753.61$, $SD = 140.97$), $t(218) = .96$, $p = ns$, rejecting H1b.

**Advertorial structure and persuasive outcomes.** RQ1 explored to what extent the message structure of health advertorials directly or indirectly influenced persuasion outcomes. The proposed information processing model consisted of pathways connecting
activated advertising schema for skepticism-related words, category affect, attitudinal response toward messages, and behavioral intention to adopt the promoted product.

**Measurement model.** Latent constructs in the measurement model were (1) category affect toward health ads; (2) attitudes toward messages; and (3) behavioral intention. The attitude latent construct consists of five 7-point semantic differential variables, including (1) harmful-(7) beneficial, (1) foolish-(7) wise, (1) useless-(7) useful, (1) unfavorable-(7) favorable, and (1) misleading-(7) truthful. The four manifest variables for behavioral intention and category affect used in Study 1 were adapted for Study 2. Some of the manifest items were reverse coded to indicate that higher values reflect positive category affect or positive attitudes toward stimulus materials.

Model fit indices for a final measurement model indicated a good fit to the data, \( \chi^2(60,336) = 112.76, \chi^2 / df = 1.88, \) GFI = .95, NFI = .96, CFI = .98, RMSEA = .05, SRMR = .08. All the confirmatory factor loading estimates and covariance paths were significant at a \( p \) value less than .01. Thus, the measurement model fit was sufficient to be used for a structural path model.

**Full model.** Experimental conditions (i.e., info-first and ad-first conditions) were dummy-coded and implemented as exogenous constructs. The regular advertisement condition was used as a reference group. In the initial model, these two exogenous constructs were directly linked to LDT latency responses for the ad-skepticism index (Cronbach’s \( \alpha = .71 \), Figure 4). Item-parceling is useful when the reliability of item parcels is adequate (Cattell & Burdsall, 1975; Kishton & Widaman, 1994), and when it is needed to reduce the number of variables in the analysis (i.e., the ratio of variables to subjects) in order for more stable estimates (Hoshino & Bentler, 2013). More positive attitudes were linked to behavioral intentions to purchase the advertised product (Figure 4).

Although info-first advertorial readers, compared with regular advertisement readers, demonstrated reduced skepticism about the message they read (i.e., longer LDT response rates toward skepticism-related words, \( \beta = .16, p < .01 \)), the triggered skepticism was not associated with how people formed attitudes toward the stimulus messages (\( \beta = -.02, p = ns \)). Thus, in the final model, we present a succinct version of persuasion paths by testing direct effects of the advertorial structure on persuasion outcomes. After eliminating the ad-skepticism LDT index from the model, final model fit indices demonstrated a good fit to the data, \( \chi^2(84,336) = 142.81, \chi^2 / df = 1.79, \) GFI = .95, NFI = .95, CFI = .98, RMSEA = .05, SRMR = .07 (Figure 4).

The info-first condition predicted positive message attitudes (\( \beta = .16, p < .01 \)), indicating that, compared with regular advertisements, info-first advertorial readers showed more positive attitudes toward advertising messages which, in turn, led to increased behavioral intentions to select the advertised product. On the other hand, compared with regular advertisements, ad-first advertorials were not different in changing peoples’ attitudes toward the messages (\( \beta = .10, p = ns \)), suggesting that consumers reading ad-first advertorials developed similar responses to those reading regular advertisements.
There has been no empirical evidence to date that has tested the core elements of persuasion tactics in advertorials, namely their unique structure and its impact on information processing. Our findings with LDT response rates for skepticism-related words revealed that the placement of health information before an advertisement, referred to as “blurring practices” in advertising (Dix & Phau, 2009, p. 415), had an impact on bypassing skepticism. This lowered ad skepticism offers theoretical and empirical evidence for why the structure of advertorials can obscure marketing intent, and provides support for ASME’s concerns and related rules regarding advertising adjacency effects. The structure of advertorials, however, did not evoke the concept of deception. According to the LDT response rates toward deception-related words, readers did not automatically link this advertorial structure to deceptive tactics.

Researchers have viewed ad skepticism, often measured via self-report measures, as a predictor of an array of advertisement responses, such as attention, brand beliefs, and purchase intention (Obermiller & Spangenberg, 2000; Obermiller et al., 2005). Although Study 2’s initial path model predicted that the reduced ad skepticism, which was assessed via implicit measurement, would facilitate formation of positive attitudes toward the message, ad skepticism was not a significant determinant of such attitudes. Surprisingly, the final model implies that the two constructs of skepticism and message attitudes were distinct, unrelated constructs. This validates earlier assertions that despite their aroused skepticism toward advertisements, people do not
Kim and Hancock

always associate advertisements with negativity, especially when the effect of ad skepticism is moderate or low (Cohen’s d = .32). Rather, the structure of advertorials that provided helpful information first directly generated positive attitudes toward ads (β = .16, p < .01) and led to behavioral intention to adopt the advertised product (.16 × .45 = .07), again validating the accumulating anecdotal evidence that this info-first structure creates a marketing favorable atmosphere for advertisers.

The relationship between triggered ad skepticism and subsequent responses toward advertorials appears to be a complex one. In a series of studies, Obermiller et al. (2005) found a strong association between ad skepticism and message attitudes: Viewers with a high level of ad skepticism showed negative attitudes toward informative TV ads (e.g., infomercials), and thus rejected the information conveyed in the ads. To date, the

Figure 4. Structural equation models with latent and observed constructs for Study 2.

Note. All the coefficients are based on standardized maximum likelihood estimates. Dashed lines and the ad-skepticism construct were removed in the final model. Values in parentheses indicate path coefficients reported in the initial model. The initial model fit indices were χ²(98,336) = 176.01, χ²/df = 1.80, GFI = .94, NFI = .94, CFI = .97, RMSEA = .05, SRMR = .09. The final model fit indices were χ²(84,336) = 142.81, χ²/df = 1.79, GFI = .95, NFI = .95, CFI = .98, RMSEA = .05, SRMR = .07. Coefficients in parentheses indicate the values in the initial full model prior to model modifications. RMSEA = root mean square error approximation.

*p < .05. **p < .01.
role of ad skepticism in the processing of advertisements has been unclear, especially when levels of skepticism are low or moderate.

One possible explanation is that skepticism reduction was a relatively small effect (Cohen’s $d = .32$), so it may not have been powerful enough to detect significant associations with attitudes and intentions. Another reason may be the nature of the measures: Ad skepticism was captured indirectly with an implicit measure (LDT) whereas attitudes and intention were measured directly with self-report. It might be the case that our self-report assessments of persuasion outcomes were not sufficiently sensitive to pick up variations in LDT measures. Future work that produces a stronger effect of ad-skepticism reduction with different sets of skepticism-related words for the LDT, or uses more sensitive measures of attitudes (e.g., Obermiller et al., 2005, SKEP scale), is required to test these possible explanations.

**General Discussion**

Blurring practices between editorials and advertising first appeared as early as the late 1940s in television (e.g., infomercials) and print media in the United States, and the volume and revenue of blurring practices of advertising are increasing. However, a close examination on the persuasiveness and effectiveness of these communication tactics is surprisingly underexplored. The present experiments are the first to systematically examine whether specific communication tactics used in advertisements circumvent the activation of advertising schema and enhance persuasion outcomes. In alignment with ASME’s guidelines for labeling and advertising adjacencies rules, LDT findings in the two experiments suggest that both advertising labeling and message structure weaken the activation of the advertising schema, especially concepts related to persuasion (Study 1) and skepticism (Study 2). The LDT results from the study indicate that the activation of advertising schema is sub-concept specific; persuasion- and skepticism-related words showed time differences between conditions while advertisement- and deception-related words did not. Consistent with the schema theory, the target schema (advertising schema) was regarded as a network of related concepts that warrant a typical response toward advertisements (Bornstein, Ng, Gallagher, Kloss, & Regier, 2005). More specifically, relative to unlabeled advertorials, exposure to labeled advertorials facilitated awareness of persuasion intent, suggesting the importance of displaying an explicit “Advertisement” label in advertorials. Interestingly, this schema activation did not apply to advertisement-related words, indicating that readers might not categorize advertorials as advertisements.

In Study 2, compared with regular advertisements, info-first advertorials significantly reduced advertising skepticism (longer LDT responses toward skepticism-related words), suggesting that the unique structure of advertorials lowers the “perceptual guards-up” that readers often exhibit toward traditional advertising content (Huh, DeLorme, & Reid, 2004, p. 571). In addition, providing useful health information prior to advertising messages did not evoke a sense of deception. These multiple sub-concepts measured through an LDT distinguished specific sub-concepts influenced by communication tactics in advertorials.
In an effort to extrapolate implicit responses to persuasion-focused processing of advertorials, LDT data were implemented into SEM models that included self-reported measures of attitudes, category affect, and behavioral intention. This information processing approach reveals the enhanced persuasion outcomes of advertorials, compared with regular advertisements, because of unobtrusive persuasion intent (Study 1) and incorporated useful health information (Study 2). The present study has noteworthy implications for persuasion research on primacy effects and message order effects (Buda & Zhang, 2000; Haugtvedt & Wegener, 1994; Hovland & Mandell, 1957; Murphy et al., 2006). Several studies have reported robust support for primacy effects. When readers were highly motivated to think carefully of two persuasive messages, the information presented first had greater influence on impression formation of candidates in voting situations (Koppell & Steen, 2004) and increased a person’s willingness to purchase an advertised product (Buda & Zhang, 2000). According to the final model in Study 2, a simple but powerful manipulation of the message structure that presented useful health information first made readers more willing to adopt a suggested behavior, supportive of a primacy effect, buttressing ASME’s concerns around advertising adjacencies.

It should be noted that according to Bergus, Levin, and Elstein (2002), the persuasiveness of the information presented in the beginning (primacy effects) manifested when the content involved low-risk consequences as a result of adopting a suggested behavior (e.g., benefit of taking aspirin as therapeutic treatment). This primacy effect did not emerge when the advertised content involved high-risk decisions (e.g., getting surgically invasive carotid endarterectomy treatment). The context of our Study 2 was based on relatively low-risk behaviors (e.g., buying healthy eating products). The observed primacy effects might have been reduced or suppressed if the applied context of advertorials was promotion of high-risk behaviors (e.g., getting high-risk treatment). In future research, a more complete set of message characteristics and individual characteristics should be examined to understand the relationship between persuasion tactics in advertising and audience response. In addition, this tactic of presenting relevant, useful information prior to advertisements can be applied in health campaigns and interventions: Providing information first before promoting a relevant social or health behavior may enhance the persuasiveness of the content.

**Methodological Implications and Limitations**

The present experimental interface allowed for numerous advanced experimental controls that were critical for the project (e.g., timing, randomization, smooth transitions, 48 LDT trials, and self-report measures within the interface to minimize interruption). A relatively seamless environment was reproduced for study participants so that they were able to view study stimuli as they normally do on the Internet. By developing customized virtual experiments and utilizing crowdsourcing websites like MTurk, the present experiments were developed with enhanced flexibility and experimental sophistication, including several pilot tests that are not reported here. The MTurk platform also allowed us to ensure that participants were attentive during the virtual experiments by asking them to describe the study in detail for verification purposes before submitting their IDs for payment. These text-based descriptions indicate that
participants carefully read the stimuli without having an experimenter physically present in an artificial setting (e.g., a lab).

Previous findings have reported that empirical data collected through a crowdsourcing channel are no different from data collected by other more standard methods (Mason & Suri, 2012). Demographics data collected from MTurk have shown that the MTurk worker population is distributed more similarly to the general population than are samples from experimental studies (Berinsky, Huber, & Lenz, 2012; Ross, Irani, Silberman, Zaldívar, & Tomlinson, 2010). Often, due to the limited cost and fixed nature of offline experimental environments, it has been challenging for researchers to test and replicate studies in an iterative manner, especially those involving various manipulations and a high participant count. These issues were overcome with the present method, suggesting practical values and implications for future persuasion and information processing research.

This approach, however, should be understood with limitations and cautions that were imposed by study settings. For example, as MTurk workers tend to participate in numerous online experiments, they may have experienced various cognitive tasks prior to our experiments. To prevent potential learning effects within the present study, special scripts were used in MTurk postings to prevent duplicate participation at least for this present study. Given the scope of the current research, MTurk recruitment options were controlled to limit participation from U.S. workers only. Controlling demographic characteristics through MTurk will be less effective if target populations are more specific, such as individuals with mental illness or substance use disorders.

Nevertheless, for the purposes of the present research, we believe that MTurk provided representative samples large enough to understand the communication processes people used while reading advertising messages. Although the present research does not involve pre-tests or follow-up measures, it is important to note that MTurk may allow researchers to conduct follow-up studies by tracking worker ID numbers. This continuity can be a useful feature to track down whether participants actually purchased the advertised product instead of only assessing their future intention of doing so.

**Conclusion**

To better understand the growing prevalence of the advertorial format as an advertising tactic, two experiments were conducted using an information processing approach. These two experiments explored the dynamic relationship between advertising schema activation, messaging-response attitudes, behavioral intention, and category affect to understand underlying cognitive mechanisms that are triggered by the advertorial format. Results from LDTs and structural equation modeling analyses indicate the importance of educating consumers about advertising practices used in the advertorial format. If consumers are familiar with and knowledgeable about advertorial tactics, perhaps they can exercise better judgment and make a more informed decision in evaluating messages in advertorials. The findings also provide strong empirical support for advertising guidelines on labeling and advertising adjacency rules. For policy implications in the context of health advertising, other features such as labeling size, location, or frequency, and the balance of information (e.g., positive info-only advertorials vs. positive-plus-negative info advertorials) should be examined in future research.
Appendix A

Sample of stimulus materials prepared for Study 1.

Sample of stimulus materials prepared for Study 2.

Note. The stimulus materials were produced by altering various parts of the original advertisements that were publicly available online. The purpose of such use is only for nonprofit educational, and research purposes to “...promote the progress of science...” [Const., Art. I, Sec. 8, Cl. 8]. We believe this use constitutes a ‘fair use’ as provided in section 107 of the US Copyright Law. All participants were debriefed at the end of the experiment that the displayed stimulus materials were fictitious and not based on a real story.
## Appendix B

Table B1. Word strings.

<table>
<thead>
<tr>
<th>Word strings for Study 1</th>
<th>Word strings for Study 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of letters</td>
<td>Target words</td>
</tr>
<tr>
<td>6</td>
<td>Banner</td>
</tr>
<tr>
<td>7</td>
<td>Promote</td>
</tr>
<tr>
<td>7</td>
<td>Product</td>
</tr>
<tr>
<td>8</td>
<td>Purchase</td>
</tr>
<tr>
<td>8</td>
<td>Persuade</td>
</tr>
<tr>
<td>8</td>
<td>Convince</td>
</tr>
<tr>
<td>9</td>
<td>Publicize</td>
</tr>
<tr>
<td>9</td>
<td>Influence</td>
</tr>
<tr>
<td>9</td>
<td>Marketing</td>
</tr>
<tr>
<td>10</td>
<td>Commercial</td>
</tr>
<tr>
<td>11</td>
<td>Advertising</td>
</tr>
<tr>
<td>13</td>
<td>Advertisement</td>
</tr>
<tr>
<td>Non-word strings for Study 1</td>
<td>Non-word strings for Study 2</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td><strong>6 letters</strong></td>
<td><strong>6 letters</strong></td>
</tr>
<tr>
<td>Snotch Retoke</td>
<td>Snotch Retoke</td>
</tr>
<tr>
<td>Dwandle Reunite Hongout</td>
<td>Coronery Obstacle Sareness</td>
</tr>
<tr>
<td>Sareness</td>
<td>Diversify Debastate Terlorize</td>
</tr>
<tr>
<td>Disprove</td>
<td>Labricate Foraigner Wallpeper</td>
</tr>
<tr>
<td>Delgate</td>
<td>Underland Trajectery</td>
</tr>
<tr>
<td><strong>7 letters</strong></td>
<td><strong>7 letters</strong></td>
</tr>
<tr>
<td>Deligate</td>
<td>Retaliation Withhording</td>
</tr>
<tr>
<td><strong>8 letters</strong></td>
<td><strong>9 letters</strong></td>
</tr>
<tr>
<td>Diversify</td>
<td>Decamposition Sociolization</td>
</tr>
<tr>
<td>Debastate</td>
<td>Snotch Retoke Arlure Inpede</td>
</tr>
<tr>
<td>Terlorize</td>
<td>Coronery Obstacle Sareness</td>
</tr>
<tr>
<td>Sareness</td>
<td>Retoke Coronery</td>
</tr>
<tr>
<td>Disprove</td>
<td>Diversify Debastate</td>
</tr>
<tr>
<td>Delgate</td>
<td>Debastate Terlorize</td>
</tr>
<tr>
<td><strong>9 letters</strong></td>
<td><strong>10 letters</strong></td>
</tr>
<tr>
<td>Debastate</td>
<td>Labricate Foraigner Wallpeper</td>
</tr>
<tr>
<td>Terlorize</td>
<td>Underland Trajectery</td>
</tr>
<tr>
<td>Foraigner</td>
<td>Retaliation Withhording</td>
</tr>
<tr>
<td>Wallpeper</td>
<td>Decamposition Sociolization</td>
</tr>
<tr>
<td><strong>10 letters</strong></td>
<td><strong>11 letters</strong></td>
</tr>
<tr>
<td>Labricate</td>
<td>Snotch Retoke Arlure Inpede</td>
</tr>
<tr>
<td>Foraigner</td>
<td>Coronery Obstacle Sareness</td>
</tr>
<tr>
<td>Wallpeper</td>
<td>Retoke Coronery</td>
</tr>
<tr>
<td>Encomposs</td>
<td>Diversify Debastate</td>
</tr>
<tr>
<td>Colarless</td>
<td>Debastate Terlorize</td>
</tr>
<tr>
<td><strong>13 letters</strong></td>
<td><strong>13 letters</strong></td>
</tr>
<tr>
<td>Terlorize</td>
<td>Labricate Foraigner Wallpeper</td>
</tr>
<tr>
<td>Foraigner</td>
<td>Underland Trajectery</td>
</tr>
<tr>
<td>Wallpeper</td>
<td>Retaliation Withhording</td>
</tr>
<tr>
<td>Encomposs</td>
<td>Decamposition Sociolization</td>
</tr>
</tbody>
</table>
Acknowledgments

The authors wish to thank David A. Dunning, Lisa A. Marsch, Jessie G. Taft, Alexander Olshanskiy, Jeff Niederdeppe, and Francoise M. Vermeylen for their help and valuable suggestions on this project at various stages.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

References


**Author Biographies**

**Sunny Jung Kim** received her PhD in Communication from Cornell University. She is a faculty member in the Department of Biomedical Data Science and the Department of Psychiatry at the Geisel School of Medicine at Dartmouth. She studies persuasion, sociopsychological and behavioral mechanisms of technology-based health interventions, and scalable health monitoring.

**Jeffrey T. Hancock** received his PhD in Psychology from Dalhousie University. He is professor in the Department of Communication at Stanford University. He works on understanding psychological and interpersonal processes in social media.