

# Enhancing television advertising: same-language subtitles can improve brand recall, verbal memory, and behavioral intent

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**Abstract** This research explores how same-language subtitles—on-screen text that matches the spoken language—can enhance advertising effectiveness for television commercials on normal viewing audiences outside of foreign-language or deaf-viewer contexts. A preliminary eye-tracker study shows that same-language subtitles capture disproportionate visual attention, and a first study highlights that same-language commercial subtitles can increase brand recall and memory of other verbal ad information. Three further studies using 12 additional ads reinforce the positive effects of subtitles and show how same-language subtitle effectiveness varies with changes in visual and verbal ad complexity. In addition to showing how subtitles can increase behavioral intent, results also highlight how varying subtitle content affects memory gains and illustrate how subtitles can lead to negative effects in the uncommon situation that brand information is missing from the audio. As the efficacy of television advertising becomes increasingly debated, same-language subtitling is a simple way to boost advertising effectiveness.

**Keywords** Advertising · Subtitles · Brand recall · Memory

The current media environment has not been kind to television commercials. The popular press is filled with articles

proclaiming the death of “interruption marketing” (Berman et al. 2009; Sacharin 2001), as viewer habits and new technologies call into question the effectiveness of traditional ads. At the same time, the visual and audio fidelity of television advertising remain superior to other promotional channels, and television advertising is still highly effective for brand-building, reminder, and affective-centered campaigns (Jamhuri and Winiarz 2009; Shachar and Anand 1998). Given the traditionally high cost of television advertising, marketers cannot remain complacent but instead must search for any tools that can increase advertising effectiveness (Stewart 2009).

Recent studies on improving advertising effectiveness have explored factors such as visual complexity in print ads (Pieters et al. 2010) and plot structure in television advertising (Loewenstein et al. 2011). An area that has remained relatively unexplored within commercials, however, is the effect of same-language subtitles (i.e., on-screen text in the same language as the audio). As one of the least expensive ways to modify visual media (Koolstra et al. 2002), same-language subtitling could become an easily-implemented method to enhance marketing outcomes for television advertising.

Subtitles need not be a tactic employed only with foreign-language content or media aimed at hearing-impaired audiences. Small but growing streams of research in media psychology have explored the effects of subtitles on visual processing, and recent work has begun to examine how same-language subtitling can be used in educational contexts to increase content memory (Yuviler-Gavish et al. 2011) and improve literacy in developing countries (Kothari and Takeda 2000). However, educational contexts are very different from traditional entertainment media, with explicit and implicit processing goals not necessarily present during commercials. Do same-language subtitles increase the effectiveness of traditional television commercials on traditional television audiences? And are any benefits due to

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dual-driver reinforcement models, or are they a function of mere message repetition?

To explore the effects of same-language subtitling in television commercials, this research investigates a set of key questions. First, does providing same-language subtitles in a commercial alter visual attention? Second, do same-language subtitles increase commercial effectiveness? Third, does this effect change if the surrounding commercials and show also are subtitled? Fourth, does the effect of same-language subtitles vary with changes in the visual and verbal complexity of the commercial? Fifth, can same-language subtitles be made more or less effective by varying their content? Finally, are there scenarios in which the presence of same-language subtitles can harm rather than help ad processing?

A system of four studies provides answers to these questions. A pilot eye-tracker pre-study explores visual attention in subtitled commercials. After we develop hypotheses based on these findings and prior literature, Study 1 uses an expanded television show with multiple commercial breaks to establish the effects of same-language subtitling on traditional outcomes such as recall. Study 2 manipulates the level of visual and verbal ad information to explore how response to same-language subtitles varies with ad complexity. In Study 3 we explore how using verbose or abbreviated subtitles affects ad memory and attitude. Finally, Study 4 shows limitations to subtitling in the uncommon case when verbal branding is not explicit. These overall results highlight how same-language subtitling can improve commercial effectiveness and provide implications for both managerial strategy and future research exploration.

### Subtitles, visual attention, and memory

Despite its common usage in cross-language applications (e.g., foreign cinema, content translation), in aids for the deaf, and increasing usage in educational contexts, subtitling has received comparatively little attention from the visual communication and cognitive psychology research fields (Perego et al. 2010). Allocating attention between visual content and subtitling content within media seems relatively effortless and automatic, and reading subtitles generates minimal cognitive overhead (D'Ydewalle and Gielen 1992). Indeed, both reading and visual processing are efficient and partly automatized activities requiring little conscious effort (Rayner 1998; Zhou 2004). At the same time, visual attention seems automatically drawn to subtitles, even when the subtitles are in the same language as the verbal track and contain no “new” information beyond the audio; prior work has shown that same-language subtitles can capture 16–21% of visual attention (D'Ydewalle et al. 1991).

Most research on subtitles has focused on how to maximize subtitle effectiveness for deaf audiences (Jensema et al. 2000)

or how to increase subtitle efficiency through mechanical display factors such as line length and audio synchronization (Cintas 2003). Almost all scholarly work on same-language subtitles, outside of research on closed-caption processing by the deaf, has been conducted in international education contexts, such as the use of subtitles to increase literacy in rural and foreign countries (Kothari and Takeda 2000) or to teach translation and language instruction skills (Rundle 2000). Educational research has also examined same-language subtitles in multimodal instruction (Dowell and Shmueli 2008) and how subtitles alter the processing of educational content.

Research on subtitles within entertainment media, however, is almost exclusively contained in work exploring foreign-language film and television subtitling (Kuppens 2010; Wissmath et al. 2009), with virtually no work exploring subtitling within advertising content. Within educational and entertainment contexts, the viewer is motivated to process the content correctly, completely, and efficiently. Both conscious and nonconscious goals guide attention in these environments (Alexander and Winne 2006; Egeth and Yantis 1997); subtitles may increase plot comprehension in movies and content retention in educational contexts. But what about during commercials? Many commercials are not personally relevant to the viewer and present little motivation for effortful processing (Macinnis et al. 1991). Many researchers argue that the default processing level for advertisements is very low due to their sheer number, lack of personal relevance, low risk, and consumers' negative attitudes toward advertising (Ducoffe 1996).

Because there are reduced goals or motivations for the viewer to process random advertising content efficiently or correctly in comparison to educational or entertainment content, visual patterns shown for subtitles in those contexts may not carry over into advertising. Although the processing of subtitles seems nearly automatic on the part of the reader, some evidence reveals that reading subtitles may increase mental workload (Sohl 1989). Will commercial viewers have any motivation to engage in such processing? Prior research suggests that viewers read subtitles even when they are less important or carry less information (D'Ydewalle et al. 1987), so visual attention to subtitles may be relatively invariant to the content in which it is placed, but the reduced goal-motivation created by ads suggests that this effect must be established rather than assumed.

Another visual aspect of same-language subtitles that may affect ad processing is that subtitled commercials are currently rare. Thus, they may “pop out”, and the subtitles may be highly salient as an unexpected stimulus. Work in visual psychology has established that novel or infrequent stimuli can cause an automatic orientation effect (Becker and Horstmann 2011; Itti and Baldi 2009), where visual attention is automatically drawn to areas that have displayed surprising

or unexpected stimuli without conscious involvement, and the eye is more likely to return to these areas to better catch further potential unexpected stimuli. That is, not only might subtitles alter visual attention within commercial content, but same-language subtitles may also affect visual processing during commercials simply because they are currently so rare.

Therefore, before research can explore the effects of ad subtitling on traditional marketing outcomes, it must first establish whether the patterns of visual attention witnessed for subtitling in entertainment and educational contexts carry over to commercial advertising content. Will subtitles still capture attention without the strong goal-driven incentives to process them as in educational contexts or with deaf viewers, and does attention to commercial subtitles differ when all content is subtitled versus just the commercial?

### Pre-study: visual attention to commercial subtitles

To explore the effects of same-language subtitles on visual attention in commercials, we designed a custom television program for eye-tracker analysis. Using a professional video-editing program, we created a ten-minute show from an episode of the BBC program *The Secret Life of Birds*, with a 90-s three-commercial pod (Maytag, Red Lobster, and McDonald's) inserted into the middle of the show content (see Fig. 1). Commercials were collected from recordings of prime-time television. We created three versions of the show: a baseline condition with no subtitles (NoSub), a version in which the target Red Lobster commercial (the middle advertisement in the commercial pod) contained same-language subtitles (TargetSub), and a version in which all show and commercial content contained subtitles (AllSub). When adding subtitles we followed established criteria for line length, audio–subtitle synchronization, and characters per line (Cintas 2003; Ivarsson and Carroll 1998).



Fig. 1 Sample subtitled commercial image

### Protocol and measures

Sixty participants recruited from a major East Coast university ( $M_{\text{age}}=20$ , 60% female, 93.3% listed English as their primary language) were run individually and randomly assigned to the three conditions. After giving informed consent, participants were seated in front of the stimulus display machine and calibrated to the eye-tracker system, an ASL 6000 remote optics unit yielding point-of-gaze data at 60 frames per second. Participants were informed that they were going to watch a television show, then one of the three randomly selected show stimuli was displayed on a computer monitor attached to the eye-tracker system. Following stimulus exposure, participants were compensated with a \$10 Amazon gift certificate for participation.

Frames where the participant's gaze was in the same area of the screen as subtitle presentation (i.e., the subtitle zone) were marked in the data. The subtitle zone extended slightly above the top line of the subtitles for coding purposes because prior work has shown that viewers bias their focal attention slightly above the subtitles being read (Gielen 1988). For each participant, we computed the percentage of time spent within the subtitle zone during the target Red Lobster commercial, the overall commercial pod, and the show content.

### Results

Although the subtitle zone encompassed 20.6% of screen space, subtitles are considerably lower than the center of the screen and prior research has established a strong center-of-screen bias for visual attention on television (Brasel and Gips 2008). Indeed, in the no-subtitle (NoSub) condition, the subtitle zone captured only 3% of visual attention during the target commercial, and 7% during show content. When subtitles were introduced, visual attention was strongly drawn to the subtitle zone (see Table 1), and the subtitling manipulation had a significant effect on visual attention in the subtitle zone (represented by the number of frames) for both show content and the target commercial (during the show:  $F_{(2, 49)}=33.56$ ; during the target Red Lobster commercial:  $F_{(2, 49)}=18.11$ , both  $p < .001$ ).

For commercial content, the subtitle zone captured more visual attention during the target Red Lobster commercial in the TargetSub condition (24.3% of visual attention) when compared with the NoSub participants (2.5%, frame-count comparison  $t_{(32)} > 7$ ,  $p < .001$ ). Likewise the subtitles during show content in the AllSub condition captured 24% of visual attention, compared to the same region receiving roughly 8% of visual attention when not subtitled in the NoSub condition (frame-count comparison  $t_{(32)} > 5$ ,  $p < .001$ ).

The difference in visual attention within the subtitle zone for the target commercial between the AllSub and TargetSub conditions (17% versus 26%; t-test of frames significant at  $p$

**Table 1** Pilot study: visual attention to subtitles during show content and target commercials

	No content subtitled	Target ad subtitled	All content subtitled	Significance of target sub vs. no sub	Significance of all sub vs. no sub	Significance of target sub vs. all sub
% attention in subzone during target ad	2.5%	24.2%	17.1%	$p < .001$	$p < .001$	$p < .01$
% attention in subzone during show	7.8%	7.9%	24.2%	n.s.	$p < .001$	$p < .001$

NoSub  $n=21$ , TargetSub  $n=21$ , AllSub  $n=18$ . Attentional tests are measured in frames. *n.s.* not significant

<.01) suggests that a pop-out effect occurred when same-language commercial subtitles were presented without the surrounding content being subtitled. And while attention within the subtitle zone dropped precipitously between show content and the target commercial for NoSub participants (with target ad subtitle zone attention at only 32% of show level), this drop was much less pronounced for AllSub participants (with ad subtitle zone attention at 71% of show level, difference between show content attention and ad content attention t-test of frames significant at  $p < .01$ ). This reduction of attention in the subtitle zone during the commercial content versus show content for AllSub participants, even though the words-per-minute of the advertising was considerably higher than the show content, reinforces that commercial content and entertainment content may be processed differently with respect to subtitles, and findings from high-involvement and goal-driven educational contexts may not closely map onto advertising stimuli.

### Moving from visual attention to advertising effectiveness

The pre-study confirms that, in line with prior work in foreign-language subtitling, subtitles retain their power to capture visual attention even when they are in the same language as the audio and placed into advertising content with significantly reduced consumer incentives to process effortfully when compared to educational or entertainment contexts. By combining these results with prior work in educational and visual processing literature, we advance four predictions regarding the effects of same-language subtitling on advertising. First, commercial subtitles should have an effect on brand memory because of changes in cognitive processing. Subtitles increase the redundancy of verbal content, which should increase recall and recognition of audio information (Drew and Grimes 1987; Zhou 2004). When the brand is mentioned within the commercial audio, subtitles can reinforce that brand mention. In addition, simultaneous presentation of visual text with verbal audio can aid in the comprehension of more complex information when compared to audio alone (Dowell and Shmueli 2008), and information presented in multiple modalities is more likely to be remembered. According to the cognitive theory of multimedia learning (Mayer 2009), this is due to multimodal content

creating both a verbal and a visual model for the content under study, enriching both stored and working memory for that construct.

For example, integrating information from visual and verbal streams can create more rapid and accurate emotional categorization (Focker et al. 2011), and combining text with visual information improves text comprehension while actually reducing cognitive load (Yuviler-Gavish et al. 2011). In addition, prior research suggests people process text through verbal working memory rather than visually (i.e., text is read with the eyes but processed phonologically), so text presented simultaneously with audio should further reinforce any information in the audio track (Brunyé et al. 2006).

Research supporting this assertion is not unilateral, however. Reading content simultaneously with audio presentation of content has sometimes shown negative effects as a result of working memory limitations created by the need to coordinate between the two (Kalyuga et al. 2004), and some work in educational literature has shown memory impairment for content that is presented as both audio and text (Jamet and LeBohec 2007). At the same time, same-language subtitling in commercials should avoid these issues; the working memory overhead that can lead to negative effects seems driven by the effort to mentally synchronize between the text and audio. With subtitles, the text is synched to the verbal content for the viewer. As long as the addition of subtitles does not make the visual content of the commercial too overwhelming, same-language subtitles should improve recall and memory of verbal audio information within the commercial such as brand names.

H1: Commercials with same-language subtitles increase brand recall compared with commercials without same-language subtitles.

Second, the presence of subtitles may interfere with the processing of other visual information. Prior advertising research has explored attentional trade-offs between advertising elements (Pieters and Wedel 2007), with increased prominence of magazine ad text somewhat reducing visual attention to pictorial elements. Prior work has also acknowledged that little research has explored the effect of subtitle presence on processing of other pictorial information (e.g., Perego et al. 2010), with eye-tracker work illustrating how on-screen text can draw vision away from pictorial aspects of a scene (Schmidt-Weigand et al. 2010).

Visuospatial load theory (Mayer 2009; Moreno and Mayer 1999) suggests that text and visual content can interfere with each other when presented simultaneously, and on-screen text can create competition between the visual and the textual channels for consumer attention (Mayer et al. 2001). D'Ydewalle and De Bruycker (2007) show that though fixations on subtitle text are generally shorter than traditional reading fixations, attentional focus still shifts between visual content and subtitling content within a scene. Because visual perception is generally not available during attentional shifts due to the saccadic movement of the eyes, the presence of subtitles may interfere with pictorial processing of the advertisement. Thus, although prior research suggests that processing of subtitles requires little conscious attention (D'Ydewalle and Gielen 1992), reading subtitles can still pull visual fixations away from the rest of the visual content of the commercial.

H2a: Same-language subtitles can increase attention to, and memory of, verbal information in commercials.

H2b: Same-language subtitles can decrease attention to, and memory of, visual information in commercials.

Third, the results of the pre-study show a pop-out effect when the target advertisement is the only content with subtitles, compared with when all content has subtitles. This salience-based effect should offer increased attention to and memory of the subtitled content, as prior research has shown increased visual attention to novel or unexpected visual stimuli (Antes 1974; Loftus and Mackworth 1978). In the pre-study the novelty of subtitles when the commercial was the only subtitled content increased visual attention within the subtitle zone when compared to the everything subtitled condition. Thus, any positive effects of subtitles on brand processing should be magnified in scenarios in which the only subtitled content is the target commercial.

H3: The positive effect of same-language subtitling on brand recall is stronger when the surrounding show and ad content do not have subtitles.

Fourth, if the presence of subtitles for a target commercial is novel and increases ad salience, this could affect the processing of subsequent ad content. Novel visual stimuli can alter attention and cognition (Kirino et al. 2000), and oftentimes novel or unexpected stimuli can be interpreted as a signal and used to modify attention and responses to subsequent stimuli (Suwazono et al. 2000). If only a target advertisement has subtitles, the subsequent advertisement's lack of subtitling may also be salient, causing the viewer to devote cognitive resources to the discrepancy between the two ads rather than the ad content itself.

H4: The presence of same-language subtitles in an advertisement reduces memory of subsequent content.

## Study 1: commercial subtitles and marketing outcomes

To explore this system of four hypotheses, we conducted a three-condition experiment. The show stimulus was an expanded version of the show *The Secret Life of Birds* used in the pre-study; the version in this study lasted 24 min with three three-commercial pods (pod 1: Maytag, Red Lobster, and McDonald's; pod 2: Hertz, Claritin, and Febreze; pod 3: Glade, Bissell, and Realtor) evenly spaced throughout the show. Commercials were collected from recordings of prime-time television across 2 weeks. We created three versions of the show stimulus. In the no subtitles condition (NoSub), the show and commercials were presented without subtitles. In the target commercial subtitles condition (TargetSub), the middle "target" advertisement of each of the three commercial pods contained subtitles (Red Lobster, Claritin, and Bissell), while the two other commercials in each break and show content did not. In the all subtitles condition (AllSub), all show content and commercials contained subtitles.

### Protocol

We used a large auditorium-style classroom with digital projection and sound for all three conditions. Sixty-four undergraduate participants at a large East Coast university ( $M_{age}=19.5$ , 62.5% female, 95.3% report English as their native language, and 100% report comfort and fluency with English) were recruited through campus e-mail and direct recruitment efforts, and they were compensated with a \$10 gift certificate from Amazon for participation. Preliminary screening ensured that no participants from the pre-study participated in Study 1, and sessions took place at a similar time of day to control for variations in salience of food-oriented commercials. After completing informed consent, participants were told they would be watching a television program and answering some questions about the show afterwards. They were then shown one of the three show stimuli, following which they completed the study survey measures.

### Measures

We recorded participants' responses using a poststimulus survey. Participants first answered basic show responses (Likert scales of interest and entertainment), along with free-response questions of memory for show content. They then answered free-response recall questions for the advertised brands (which were then experimenter-coded based on explicit mention of the brand). On a new page, participants rated the three target ads on whether they found them interesting, entertaining, visually interesting, and involving (seven-point Likert scales). These ad-attitude measures were

chosen due to prior research showing that responses to peripheral measures such as communicator likeability were more important for television ads in comparison to measures of the attitudes toward ad content (Chaiken and Eagly 1983). The participants then answered a series of free-response verbal and visual recall questions about ad content such as brand slogans or which dishes and characters appeared in the commercial (which were experimenter coded based on correct or incorrect recall). Measures of prior ad familiarity and participant demographics were collected; when included as covariates in analysis they had no effect on results and so are not discussed further.

Results

*Do subtitles affect brand recall?* An initial examination of the data reveals support for H1; TargetSub participants have higher brand recall than NoSub participants for Red Lobster (65% versus 31%), Claritin (52% versus 25%), and Bissell (35% versus 23%, see Fig. 2). To explore the effects of subtitling on brand recall, a repeated-measures ANOVA with brand as the within-participant replication and subtitle condition as the between-participant manipulation reveals a significant effect of subtitles (subtitle manipulation  $F_{(2,57)}=4.6, p<.05$ ); difference contrasts reveal that the TargetSub condition scores higher brand recall than both the NoSub (contrast estimate 27%,  $p<.01$ ) and the AllSub conditions (contrast estimate 17.5%,  $p<.05$ ). Crosstabs-based exploration of the conditions individually reveals a significant association between the subtitle condition and brand recall for Red Lobster ( $\chi^2_{(2)}=9.23, p<.01$ ) and Claritin  $\chi^2_{(2)}=6.02, p<.05$ , with a directional association for Bissell. As seen in Fig. 2, the presence of subtitles improves brand recall, with the TargetSub condition outperforming both the NoSub and AllSub conditions, supporting H1<sub>1</sub>.

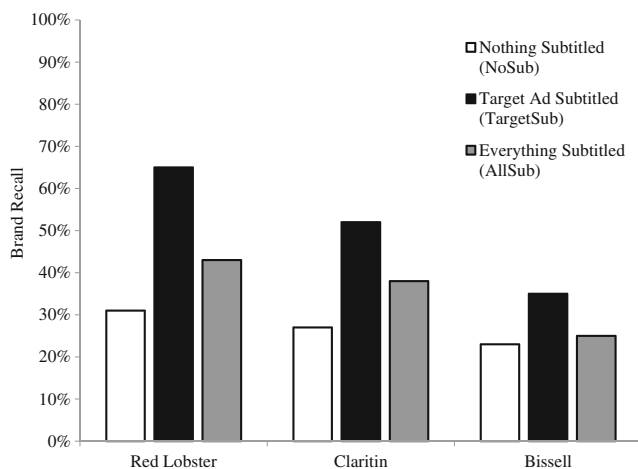


Fig. 2 Study 1: same-language subtitles improve recall of target advertisements in commercial pods

This relationship is reinforced with analysis using binomial logistic regression exploring a pair of condition-based dummy IV variables (AllSub and TargetSub compared with the NoSub baseline) on the 0/1 brand recall DV variable. Consistent with H1, the results are significant for Red Lobster and Claritin; the subtitling condition dummies generated significant predictive power over the baseline scenario (Wald statistics > 4.95/7.61 for AllSub/TargetSub dummies, overall model Chi-Square significances <.01, overall model for Bissell directional at  $p<.10$ ). The effects of subtitling on brand recall are also apparent in the percentage of brands free-recalled that were the target brands. In the NoSub condition, the three target advertisements made up only 13% of all free-response recalled brands, while in the AllSub and TargetSub conditions, the percentages rose to 22% and to 34%. These results provide further support for H1.

*Do subtitles alter memory of visual and verbal information?* The survey asked a series of free-recall questions related to the verbal and visual information in the target advertisements, such as brand slogans, characters present, and other content. A pair of repeated-measures ANOVAs with the subtitle manipulation as the between-subjects independent variable and the series of verbal or visual recall questions as the within-participant replication reveals a significant effect of subtitles on both verbal ( $F_{(2,53)}=3.879, p<.05$ ) and visual recall ( $F_{(2,51)}=3.259, p<.05$ ). Consistent with H2a and H2b, subtitle presence increases the recall of verbal information and decreases the recall of visual information.

Recall rates for the separate visual questions were combined to create a total visual recall measure, and recall rates for the separate verbal questions were then combined to create a total verbal recall measure. Crosstabs analysis exploring the association between subtitle condition and recall rate reveal a significant positive association for subtitles and verbal recall ( $\chi^2_{(2)}=7.27, p<.05$ ) and a significant negative association for subtitles and visual recall ( $\chi^2_{(2)}=6.61, p<.05$ ). Exploring specific cell comparisons, TargetSub has higher verbal recall than NoSub (Fisher’s Exact  $p<.01$ ) and lower visual recall than NoSub (Fisher’s  $p<.05$ ). AllSub as well has higher verbal recall than NoSub (Fisher’s  $p<.05$ ). The pattern of results (see Table 2) is consistent with a bias toward the verbal information and away from visual information and supports H2a and H2b.

*Does subtitling everything versus subtitling only the target commercial affect the results?* Differences in measures between the TargetSub and AllSub conditions are apparent within the data and support H3. Overall target brand recall was significantly greater in the TargetSub condition than the AllSub condition (Fisher’s Exact  $p<.05$ ). Likewise, the percentage of total brands free-recalled that were the target

**Table 2** Study 1: recall of brand and commercial information in the target ad

	No content subtitled	Target ad subtitled	All content subtitled	Overall chi-square significance	Significance of target sub vs no sub	Significance of all sub vs no sub	Significance of target sub vs all sub
Verbal information recall	20%	46%	35%	$p < .05$	$p < .01$	$p < .05$	n.s.
Visual information recall	55%	33%	44%	$p < .05$	$p < .05$	n.s.	n.s.

No Sub  $n=22$ , TargetSub  $n=23$ , AllSub  $n=18$ . n.s. not significant. Verbal information recall is summed across the three verbal recall questions; visual information is summed across the three visual recall questions

brands was significantly higher in the TargetSub condition than the AllSub condition ( $F_{(2,57)}=3.24, p < .05$ ). These results are supported by a binary logistic regression that features a “Target Ad Subtitled” dummy and “All Other Content Subtitled” dummy variable (with no subtitles serving as the baseline condition); the “All Other Content” dummy variable retained significance even when the “Target Ad Subtitle” dummy variable is taken into account. This pattern of results reinforces H3.

*Do subtitles interfere with subsequent content?* Free-response recall of commercials that follow the target commercials reveals an interference effect when only the target ad contains subtitles. A crosstabs-based chi-square combining the three-level subtitle manipulation with a 0/1 variable for free-response recall of the ads following the target advertisement reveals a significant association ( $\chi^2_{(2)}=6.14, p < .05$ ). The free-response recall for the third commercial in each pod was significantly lower when only the preceding commercial had subtitles (TargetSub, 39%) than in the conditions in which all content (AllSub, 53%) or no content (NoSub, 58%) had subtitles (both Fisher’s Exact comparisons  $p < .05$ ). These results provide support for H4.

## Discussion

The results of Study 1 confirm our hypotheses and establish the effects of same-language subtitling in commercials on ad content processing and recall; same-language subtitles increased brand recall without negatively impacting ad attitudes. Subtitles also reinforce memory of verbal messages at the cost of some interference on visual messages. An additional pop-out effect occurred when the commercial was the only content subtitled.

A question raised by Study 1 is what determines the level of efficacy for same-language subtitles in commercials. While the hypotheses were strongly supported for Red Lobster and Claritin, Bissell results were of weaker significance. Upon reflection, the Bissell ad is more complex (22 camera cuts and 55 words) than the ads for Red Lobster (10 camera cuts and 36 words) and Claritin (13 camera cuts and 31 words). This raises the issue of whether the effects of same-language subtitles are affected by the innate visual and verbal

complexity of the ad. Would adding subtitles to a highly complex ad make the commercial overwhelming? Or would same-language subtitles instead be of increased utility for more complex ads as an aid to processing?

## Visual and verbal complexity

Commercials can vary in both visual complexity (for example, the number of camera cuts) and verbal complexity (for example, the number of words in the ad). Same-language subtitles occupy a unique position in that they reinforce the verbal channel, thus making the verbal content more salient, yet subtitles are technically visual information. This suggests that subtitles have the potential to impact both the perceived verbal and visual complexity of commercials, which in turn could impact ad effectiveness.

Prior research suggests that text is processed through verbal working memory that is separate from the visuospatial memory channel (Brunyé et al. 2006). Thus, subtitles might make the amount of verbal information present in the ad more salient, by highlighting just how many words form the commercial audio. At the same time, the processing of subtitles is highly visually efficient (D’Ydewalle and Gielen 1992), so the presence of subtitles might not drastically increase the perceived visual load for the viewer. These results suggest that even though subtitles are visual information, adding subtitles to a commercial should increase perceptions of verbal complexity while having a limited effect on visual complexity.

H5: Adding same-language subtitles to a commercial will increase perceived verbal complexity but will not increase perceived visual complexity.

Does the effect of subtitles on ad processing change as the level of commercial complexity increases? On-screen text can create competition between visual and verbal channels for consumer attention (Mayer et al. 2001). This effect will only be exacerbated by increases in visual or verbal complexity; an increase in verbal complexity creates more words to be subtitled, which might interfere with visual content (Mayer 2009), while increased visual complexity creates a more effortful baseline for visual processing. On-screen text can

also overload the visual system and negatively affect comprehension of visual content (Jamet and LeBohec 2007), and as the amount of verbal complexity increases this effect should only increase due to the increased amount of subtitled content. With the automatic capture of visual attention by text leading to increased visual movement, increasing verbal complexity could reduce attention to visual content within the commercial, a problem that would make visually complex material even more effortful and difficult to correctly process. These results suggest that same-language subtitles may be most effective for low-complexity ads in which there is limited verbal content to display as subtitles, and the visual environment the subtitles are placed into is not already overwhelming to begin with.

- H6a: Commercials with same-language subtitles will outperform their non-subtitled counterparts on information recall when the overall verbal and visual complexity in the commercial is low to moderate, but not high.
- H6b: Adding subtitles to a commercial high in verbal and visual complexity increases perceptions of being overwhelmed, decreasing ad attitudes.

## Study 2: visual and verbal information load

To explore how visual and verbal complexity alters the effects of same-language subtitles on ad processing, we conducted a study in which the complexity of the target commercials was explicitly controlled. The study also extended the exploration of marketing outcome variables beyond recall into measures of ad attitudes and behavioral intent.

### Protocol

The study design was a 2 (visual complexity) by 2 (verbal complexity) by 2 (subtitle presence) crossed factorial, with complexity manipulated within-subject across four commercials and subtitle presence manipulated between subjects. To manipulate complexity, 12 h of primetime television were recorded to create a pool of 56 30-s ads. Four candidate ads were chosen for each combination of complexity (Low Visual–Low Verbal, Low Visual–High Verbal, High Visual–Low Verbal, and High Visual–High Verbal). These candidates were then rated on verbal complexity by number of words spoken and on visual complexity both by counting the number of camera cuts and by using the size of the file created from audio-free video compression to explore their Kolmogorov Complexity level (Kolmogorov 1968).

This process led to the selection of four target ads: Travelocity (Low Visual–Low Verbal with 11 cuts, 5 meg file,

and 41 words), McDonald’s (High Visual–Low Verbal with 24 cuts, 9 meg file, and 45 words), Capital One (Low Visual–High Verbal with 9 cuts, 6 meg file, and 82 words), and Macy’s (High Visual–High Verbal with 30 cuts, 11 meg file, and 84 words). The High Verbal ads had roughly double the words of the Low Verbal ads, and the High Visual ads had at least double the camera cuts of the Low Visual ads.

The stimulus show was a new 16-min edit of a new episode of *The Secret Life of Birds* into which four three-commercial pods were inserted. The pods each featured one 30-s target ad (McDonald’s, Macy’s, Capital One, and Travelocity), surrounded by two 15-s ads for other products (Toyota, Campbell’s Soup, Advil, Chili’s, Brita, Pizza Hut, Kleenex, Cinnamon Toast Crunch). Two versions of the show were created, one with no subtitles (NoSub) and one in which the four target ads were subtitled (TargetSub). Three versions of each show were created with varying commercial pod order to control for any potential order effects; pod order had no effects on variables so is not discussed further.

The study was run in a theater style setting for 64 student participants overall ( $M_{\text{age}}=21.5$ , 62.5% female, 95.3% report English as their primary language). Pre-screening ensured that no participants from previous studies participated in this study. The protocol was run a total of 11 times—6 times for TargetSub and 5 times for NoSub—yielding 33 participants in the subtitle condition and 31 participants in the no subtitle condition. Participants were told they would be watching a television nature program and answering some questions about it afterwards. Following stimulus presentation, participants completed a traditional survey and were compensated with a \$10 Amazon gift certificate.

### Measures

Similar to Study 1, brand recall was first measured through free-response. Message recall was then asked on a subsequent page through open-ended questions pertaining to visual and verbal content for each commercial (for example, “what did the gnome throw to the man in the Travelocity commercial?”). Attitude toward the ad was measured through a series of seven-point Likert questions. Positive ad attitude was measured through the questions “interesting” “informative” “involving” and “entertaining” (Cronbach’s  $> .81$  for all four ads). Perceived information load was measured through consumers rating the ad as having “too much information” and being “overwhelming” (Cronbach’s  $> .85$  for all four ads). Impressions of visual and verbal complexity were asked directly (i.e., “visually complex” and “verbally complex” seven-point Likert scales). Behavioral intent measures were recorded with Likert scales for informational intent (i.e., “how likely are you to search for more information about [advertised brand]?”) and future usage (i.e., “if you were looking for a [product category], how likely would you be to use [target



brand]?”). Finally, standardized measures of the Visualizer-Verbalizer individual difference scale (Jonassen and Grabowski 1993) were included as a potential covariate along with demographics; the Visualizer-Verbalizer scale and demographic covariates did not significantly affect the pattern of results and so are not discussed further.

## Results

*Attitudes toward the ad and perceived complexity* To explore the relationship between the presence of same-language subtitles and ad complexity, a repeated-measures ANOVA was conducted with target ad as the within-subject variable and subtitle presence as the between-subjects manipulation on perceptions of visual and verbal complexity. Confirming the success of the complexity manipulations, the two High Visual ads were perceived as more visually complex than the two Low Visual ads (3.69/4.11 versus 2.29/3.04, paired  $t_{(40)} > 2.9$ ,  $p < .01$ ) but not significantly different on verbal complexity (n.s.). The two High Verbal ads were perceived as more verbally complex than the Low Verbal ads (3.75/3.9 versus 2.8/3.1, paired  $t_{(40)} > 2.6$ ,  $p < .01$ ) but not significantly different on visual complexity (n.s.). The repeated-measures ANOVA also revealed a significant main effect of subtitles on perceived verbal complexity; same-language subtitles increased perceived verbal complexity (3.72 versus 3.06,  $F_{(1,36)} = 7.47$ ,  $p < .01$ ) but not perceived visual complexity (n.s.), supporting H5.

A repeated-measures MANOVA exploring difference contrasts between the ads on attitude measures with subtitles as the between-subjects manipulation revealed significant differences between the Macy's ad and the other three ads, with a deviation contrast revealing that the effect of subtitles on the highly complex Macy's commercial was significantly different from the other three conditions (see Table 3). Results show that not only was the increase in perceived verbal

complexity with the presence of subtitles the largest for Macy's (4.19 versus 3.41,  $t_{(61)} = 2.8$ ,  $p < .01$ ), but it was also the only ad with a significant increase in visual complexity as well (4.44 versus 3.76,  $t_{(61)} = 2.2$ ,  $p < .05$ ). This is also reflected in a significant increase (4.61 versus 4.07,  $t_{(61)} = 2.14$ ,  $p < .05$ ) in the degree to which participants felt the Macy's ad was overwhelming in the subtitles present condition and a significant decrease in positive attitude toward the Macy's ad (3.12 versus 3.73  $t_{(62)} = 1.98$ ,  $p < .05$ ); the presence of subtitles did not significantly affect ad attitudes for the other three commercials. This pattern of results is consistent with H6b.

*Brand recall* A repeated-measures ANOVA on recall rates using ads as the within-participant replication and subtitle presence as the between subjects manipulation reveals a significant main effect for subtitles ( $F_{(1,60)} = 9.407$   $p < .01$ ); same-language subtitles strongly increase brand recall, providing further support to the results from Study 1 (from an average of 38% to an average of 57% see Fig. 3), and reinforcing H1. A planned deviation contrast reveals that the effect of subtitles on the Macy's ad (High Visual–High Verbal) is different from the other three conditions ( $F_{(1,62)} = 3.7$ ,  $p < .05$ ). Adding same language subtitles increased brand recall for Travelocity, McDonald's, and Capital One (from an average of 33% to an average of 60%), but had no effect on the highly complex Macy's commercial. This result supports H6a and is consistent with the complexity perceptions and ad attitudes discussed above. This pattern is also reflected in crosstabs exploration for ad recall in subtitled versus non-subtitled conditions, with significant Fisher's Exact tests for Low Visual–Low Verbal, Low Visual–High Verbal, and High Visual–Low Verbal ads ( $p < .05$ , all ChiSquares  $> 4.27$ ) but no significance for the Macy's High Visual–High Verbal ad.

**Table 3** Study 2: attitudes toward the ad and ad complexity

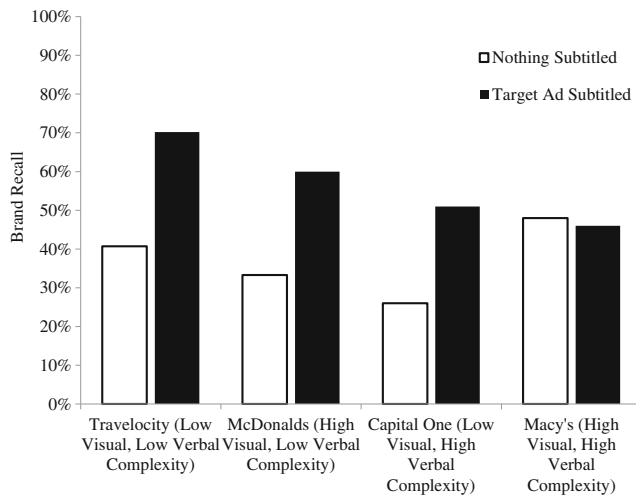
		Positive ad attitude	Felt overwhelmed	Visually complex	Verbally complex	Behavioral intent
Travelocity (low visual low verbal)	No subtitles	4.10	2.26	3.11	2.68	3.35
	Subtitles	4.50	2.34	3.14	3.09	3.97 <sup>a</sup>
McDonald's (high visual low verbal)	No subtitles	3.99	3.00	3.70	2.74	4.21
	Subtitles	4.50	3.17	3.68	3.57 <sup>a</sup>	4.77 <sup>a</sup>
CapitalOne (low visual high verbal)	No subtitles	3.92	2.84	2.89	3.42	2.70
	Subtitles	4.41	3.16	3.17	4.03 <sup>a</sup>	3.32 <sup>a</sup>
Macy's (high visual high verbal)	No subtitles	3.73	4.07	3.76	3.41	3.46
	Subtitles	3.12 <sup>a</sup>	4.61 <sup>a</sup>	4.44 <sup>a</sup>	4.19 <sup>b</sup>	3.60

No Subtitles  $n = 31$ , Subtitles  $n = 33$

Behavioral Intent is a mean measure of the “learn more” and “use” Likert scale questions

<sup>a</sup> Subtitle condition significantly different at  $p < .05$  when compared to non-subtitled counterpart

<sup>b</sup> Subtitle condition significantly different at  $p < .01$  when compared to non-subtitled counterpart



**Fig. 3** Study 2: same-language subtitles improve brand recall unless the commercial has high visual and verbal complexity

*Visual and verbal recall* Crosstabs-based analysis shows that the presence of subtitles leads to a significant increase in verbal message recall across commercials (74% versus 59% for subtitles versus no subtitles overall, combined Fisher's Exact test  $p < .05$ ) with a smaller, directional drop in visual message recall (61% versus 70% for subtitles versus no subtitles overall combined Fisher's Exact test  $p < .10$ ). Similar to Study 1 and consistent with H2, subtitles appear to reinforce verbal messages at some cost of visual message recall, and the negative effect on the visual channel appears stronger for commercials with increased verbal complexity. Consistent with the results suggesting that adding subtitles to the visually and verbally complex Macy's ad made it overwhelming for participants, Macy's featured the smallest gain in verbal recall (43% to 46%), and the largest decrease in visual recall (67% to 51%), when subtitles were added.

*Behavioral intent measures* Repeated measures ANOVAs on the "Learn More" and "Use" behavioral intent variables reveal a significant main effect of subtitle presence ( $F(1,59) = 6.25, p < .05$ ) on "Learn More", where adding subtitles significantly increases a desire to learn more about the brand (from 3.2 to 3.8 overall). A significant deviation contrast ( $F(1,59) = 2.74, p < .05$ ) reveals the effect of subtitles on Macy's differs from the other three conditions; adding subtitles to the Macy's ad does not increase the participant's desire to learn more about the brand. For the usage intent measure, a significant subtitle presence by ad interaction ( $F(3, 55) = 3.28, p < .05$ ) is explained by a significant deviation contrast for Macy's versus the other three ads ( $F(1,58) = 5.8, p = .05$ ). For the Low Visual–Low Verbal, High Visual–Low Verbal, and Low Visual–High Verbal ads, adding subtitles increases usage intent, while for the High Visual–High Verbal Macy's ad adding subtitles decreases usage intent, likely due to the increased negative

affect toward the ad and increased feelings of being overwhelmed.

## Discussion

Study 2 reinforces the findings of Study 1 and highlights the efficacy of same language subtitles in increasing advertising effectiveness while also illuminating the role that ad complexity plays in how same-language subtitles affect ad processing. The presence of same-language subtitles affects perceptions of verbal complexity and not visual complexity for all but the most complex commercials, and subtitles increase memory of verbal messages at the cost of some visual recall. Same-language subtitling can have strong positive effects on advertising outcomes such as brand recall and behavioral intent for commercials with low to moderate levels of complexity, but a commercial already high in visual and verbal complexity may not benefit from same-language subtitles, as adding subtitles makes the ad increasingly overwhelming.

Combined, the results of Studies 1 and 2 raise an interesting question: is it actually necessary to subtitle all verbal content? Abbreviated same-language subtitles that only contain the semantic essence of the message might retain their verbal recall-reinforcing ability as the dual-mode learning benefits are focused on the key brand-relevant verbal information. Abbreviated subtitles might also minimize any reduction in visual recall due to the decreased subtitle duration and focus on the key verbal message. At the same time, abbreviated subtitles would no longer perfectly match the verbal information, which is different from delayed subtitles previously studied in the literature where subtitles were out of synch but still contained all spoken words. Thus it is possible that abbreviating subtitles could potentially increase the cognitive load and processing necessary to attend to them, in effect short-circuiting the positive effects of dual-mode reinforcement. Limited prior work suggests, however, that subtitles need not be perfectly synced in order to aid message comprehension and attention (Zekveld et al. 2008), so the potential moment-to-moment mismatch between verbal and subtitle content may not present a significant obstacle to processing.

## Study 3

### Protocol and measures

To explore whether all verbal content must be subtitled for same-language subtitles to be effective or whether abbreviated subtitles can offer the same benefits, a third study was conducted. We created a 16-min edit of the sitcom *Modern Family*, containing seven commercials (Amazon Kindle Fire,

Xfinity TV and Internet, Gillette razors, York Peppermint Patties, Ram Trucks, Hershey's Chocolate, Freschetta Pizza) in four short, evenly-spaced commercial breaks. Three versions of the show were created, one with full subtitles, one with abbreviated subtitles, and one with no subtitles. Abbreviated subtitles eliminated redundant or unnecessary words in the audio and thus reduced the subtitles to the core phrases necessary to convey the audio information; for example, the line "So it will give you a much closer shave in a single stroke, and that means less irritation for your sensitive skin", was abbreviated to "a closer shave in one stroke means less irritation".

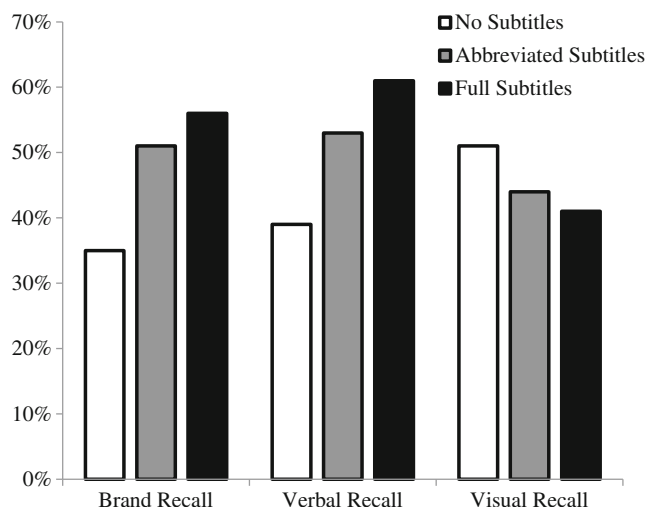
Sixty-one participants were recruited through on-campus mailing lists and classroom recruitment ( $M_{age}=21.9$ , 48% female); pre-screening ensured that no participants from prior studies participated in Study 3. The study was run 10 times (at least twice for each condition) in an auditorium-style classroom with large-screen video projector. All sessions were run at the same time of day across 3 weeks, yielding a similar number of participants in each cell (21 full-text subtitles, 20 abbreviated subtitles, and 20 control).

Survey measures were similar to those conducted in prior studies. Brand Recall was recorded as a free-response measure. On a following page, Visual and Verbal Information Recall was recorded by asking four recall questions for each ad, two pertaining to information presented only visually and two pertaining to information presented only verbally. For example, a verbal recall question might ask "how many cylinders does the Dodge Ram engine have?" while a visual recall question might ask "is the Kindle Fire HD larger or smaller than the Apple iPad?"; across the seven ads this yields a 14-point max Visual Recall score and 14-point max Verbal Recall score for each participant. Note that all verbal recall questions pertained to information that was contained in both the Full and Abbreviated subtitles.

In addition to the affective ad-attitude measures used in Studies 1 and 2, attitudes toward the ad were also measured using favorable-unfavorable and interesting-uninteresting semantic differential scales (combined into an ad attitude measure  $\alpha=.83$ ; MacKenzie et al. 1986), and a reduced form of the Schillinger Viewer Response Profile (Strasheim et al. 2007). Measures of visual and verbal complexity identical to Study 3 were also collected. Both prior brand familiarity and prior ad exposure measures were included as covariates and had no effect on results so are not discussed further.

## Results

**Brand, visual, and verbal recall** An ANOVA for brand recall (treated as a count-based variable ranging from 0 to 7 for each participant) with the subtitle manipulation is significant ( $F_{(2,67)}=5.39$ ,  $p<.01$ , see Fig. 4), with both full subtitle



**Fig. 4** Study 3: the effect of full-text and abbreviated subtitles on brand, verbal, and visual recall. Note: Brand Recall was the percentage of brands (out of 7) recalled in free-response. Visual and Verbal recall is the percentage correct (each out of 14) of free-response answers to questions about specific information within the set of commercials

and abbreviated subtitle conditions scoring significantly higher than the no subtitle condition ( $M_{FullSub}=3.93$ ,  $M_{AbbreviatedSub}=3.53$ ,  $M_{NoSub}=2.47$ , both planned contrasts  $p<.01$ ), but not scoring differently from each other (n.s.). This reinforces the positive effects of subtitles seen in Studies 1 and 2 and provides additional support for H1, while also suggesting that abbreviated subtitle ads may perform just as well as their fully subtitled counterparts. Crosstabulations of subtitling and brand recall for each individual ad reveals that the subtitled conditions had higher recall percentages across all seven ads, with increases over their non-subtitled counterparts ranging from 6% to 39%.

ANOVA analysis reveals a significant effect of the subtitling manipulation on verbal recall ( $F_{(2,57)}=8.275$ ,  $p<.001$ ), and a marginal effect on visual recall ( $F_{(2,57)}=2.713$ ,  $p<.08$ ). For verbal recall, both the full subtitles ( $M=8.57$ ) and abbreviated subtitles ( $M=7.46$ ) conditions significantly outperform the no subtitle condition ( $M=5.39$ , both contrasts  $p<.01$ ), and the full subtitle condition has marginally higher verbal recall than the abbreviated subtitle condition (contrast  $p<.09$ ). For visual recall, both the full subtitles ( $M=5.71$ ) and abbreviated subtitles ( $M=6.06$ ) score lower than the no subtitle ( $M=7.14$ ) condition, but the effect is marginal for abbreviated ( $p<.09$ ) and significant for full ( $p<.05$ ). These results provide further support for H2a and H2b, and comparing effects sizes, it becomes apparent that the verbal recall gains from subtitling are larger than the losses in visual recall.

**Ad attitudes** To explore the effect of subtitles on complexity, a repeated-measures ANOVA with the seven ads as a within subject replication, subtitle condition as a between-subjects

manipulation, and the visual and verbal complexity measures as dependent variables was conducted. In addition to the expected effect of the seven ad replications ( $F_{(6,354)}=5.228$ ,  $p<.001$ ), the ANOVA reveals a significant effect of the subtitling manipulation on verbal complexity ( $F_{(2,57)}=4.969$ ,  $p<.01$ ), but no effect on visual complexity (n.s.). Consistent with H5, contrasts reveal that both subtitle conditions are perceived as more verbally complex than the no subtitle condition ( $M_{FullSub}=4.37$ ,  $M_{AbbreviatedSub}=4.02$ ,  $M_{NoSub}=3.32$ , planned contrasts  $p<.01$  and  $p<.05$  respectively), and the full subtitle condition is also marginally higher in verbal complexity than the abbreviated subtitle condition (planned contrast  $p<.07$ ).

This increased perception of verbal complexity does not transfer into any negative attitudes toward the ad, however. A repeated measures MANOVA using the seven commercials as a within-subjects replication, subtitling condition as the between subjects manipulation, and the three ad attitude measures (affective response construct, favorable/interesting attitude measure, and the condensed VRP) as the dependent variables reveals no significant effect of the subtitle manipulation on any of the three attitudinal measures (all  $F$  scores  $<1.5$ ). This reinforces that the addition of same-language subtitles does not carry a cost with respects to attitudes toward the ad or affect generated by the ad.

## Discussion

The results of Study 3 highlight the efficacy of subtitles across seven additional commercials, reinforcing that same-language subtitles can increase brand recall as well as recall of other verbal information within the commercial. Study 3 also shows that subtitles can retain most of their power even when reduced to their abbreviated semantic essence, increasing brand recall and elevating verbal information recall, but not reducing the smaller interference effect on visual recall. Finally, Study 3 uses three alternative measures of ad-attitude and affect, and it reinforces that the introduction of same-language subtitles does not come at an affective cost toward the ad. While ads with abbreviated subtitles are perceived as less verbally complex than ads with full subtitles, both subtitling conditions are not significantly different from the unsubtitled commercial on multiple measures of attitude toward the ad.

Given the strong showing of subtitles to increase brand recall across the prior three studies, what might happen for an ad in which brand-identifying information is not present in the ad audio? As our studies show, there is a bias created by subtitles to focus on the verbal content at the expense of some recall of visual content. Ads with no brand mentions in the verbal content may therefore suffer when subtitles are added to the commercial. As some commercials limit explicit brand mentions to a static brand logo placed on-screen at the end of the commercial, this style of advertising bears investigation.

## Study 4: an uncommon case when commercial subtitles may be harmful

To explore potential limitations of same-language subtitling, we created a new version of *The Secret Life of Birds* show, lasting approximately ten minutes, with a single three-commercial break (Maytag, Buick, and McDonald's) in the middle of the show programming. There were two versions of the show, one in which the target Buick advertisement had subtitles (TargetSub) and one in which no content had subtitles (NoSub). This Buick advertisement was different from the advertisements used in Studies 1 through 3 in that the brand name (Buick) and specific model name (Enclave) were never actually stated in the audio of the commercial; instead, the only explicit branding was the Buick logo at the end of the commercial and the presence of the Buick logo and model name on the car in the commercial visuals.

## Protocol and measures

Forty-three participants (20 in the NoSub condition and 23 in the TargetSub condition) were recruited through two MBA classes at a major East Coast university; they completed the study for course credit and a \$5 Amazon gift certificate. Prescreening ensured that no participants from previous studies participated in Study 4. Participants were shown the stimuli using a large-screen video projection unit, and stimulus presentation was followed by a pen-and-paper survey. Survey measures were similar to the measures employed in Study 1. An initial free-response recall section of show content led to free-recall measures for the three advertised brands. Participants then answered a series of free-response questions regarding the verbal and visual information within the commercial. This was then followed with general demographic variables for inclusion as covariates in the analysis.

## Results

A cross-tabulation reveals a negative association between the presence of subtitles and the recall of Buick ( $\chi^2_{(1)}=5.25$ ,  $p<.05$ , Fisher's Exact test  $p<.05$ ). With no mention of the Buick brand in the audio, the presence of subtitles had a negative impact on Buick free-response brand recall (55.6% brand recall for TargetSub versus 87.5% for NoSub). Participants viewing the subtitled Buick advertisement were also significantly less likely to recall the specific name of the car model (13% vs. 43% recall when asked for the model name;  $\chi^2_{(1)}=7.26$ ,  $p<.01$ , Fisher's Exact test  $p<.01$ ). At the same time, information presented both visually and verbally in the commercial, such as the key safety features of the vehicle, exhibited no significant differences between the TargetSub and NoSub participants (44% vs. 37%,  $ns$ ), while the presence

of subtitles positively affected free-response recall of the verbal-only information, such as the product model slogan (17% versus 8%).

These effects are not due to differing overall attention levels between the two groups. Scores on recall measures for show content were not significantly different between the TargetSub and NoSub groups, and the presence of subtitles did not significantly alter the degree to which participants found the show or the Buick advertisement interesting, informative, visually interesting, or involving. Thus, similar to the results of Studies 1 and 2, subtitles seem to capture visual attention and increase the salience of the verbal content in commercials through dual-modality reinforcement. Although in most cases this is a positive effect with the potential to reinforce brand linkage and ad memory, commercials that feature limited or no mention of the brand within the audio content could potentially suffer harm if they are subtitled.

## General discussion

The results from a preliminary eye-tracker study and four experimental studies using numerous commercials in multiple show contexts confirm that same-language subtitling has a strong effect on advertising processing, altering visual attention to advertisements and enhancing brand memory and recall of verbal advertising material. These effects are shown on traditional commercials with traditional audiences, highlighting the efficacy of subtitles outside of foreign-language content or deaf audiences. Adding same-language subtitles can strongly increase brand memory, and even behavioral intent, without generating negative attitudes toward the ad. As we show through both eye-tracking measures and traditional surveys, same-language advertising subtitles capture visual attention and increase recall of verbal information such as slogans or product features, but this comes at a smaller expense of some visual content processing such as the identity of actors in the commercial or product imagery. Still, the positive effects on verbal recall appear larger than the negative effects on visual recall.

This work represents some of the first research exploring the role of visual and verbal complexity in the effects of subtitles for either commercial or educational contexts, and results show that subtitles have differing effects based on the amount of complexity in the commercial. High levels of visual complexity coupled with high verbal complexity lead to a negative effect for subtitles, as their presence makes an already complex ad even more overwhelming. In contrast, ads high in only visual or verbal complexity, or ads low in both, all benefit from the presence of same-language subtitles. Importantly, the effects of same-language subtitling were not due simply to a novelty effect because of their current

infrequent usage in real-world media. Although the effects are elevated when the target advertisement is the only subtitled content in the show, the overall positive effects of subtitles on ad processing remain even when the entire show and surrounding advertisements contain subtitles. In addition, same-language subtitles show resilience to modification and retain positive power on brand recall when cut down from full verbal replication to abbreviated semantic summaries.

## Implications for managers

The overall study results suggest that same-language subtitles present a low-cost method to increase advertising effectiveness and brand memory for many commercials and illustrate the efficacy of subtitling as an advertising tool outside of foreign-language and deaf-viewer contexts. Note that we obtained these results across numerous real-world commercials, none of which were explicitly designed with subtitles in mind. Commercials could further increase their subtitled effectiveness by ensuring that the brand name and salient information is consistently presented in the commercial audio. There are also potential first-mover advantages in subtitling, as we showed potential evidence for interference effects on commercials that followed a subtitled commercial. Importantly, the benefits of subtitling on brand memory and verbal recall did not come at the cost of brand or commercial liking as long as the ad was not already considered overwhelming without subtitles, and subtitles do not seem to affect judgments of how interesting or entertaining a commercial is.

At the same time, managers need to be aware that the processing of subtitles does carry a perceptual cost, as visual fixations are drawn to the subtitle zone within the field of media. Although subtitle reading is fast and efficient, important visual content in the commercial should be held on-screen for a longer time or presented at multiple points in the commercial to ensure it is not missed. Managers could also consider using abbreviated subtitles as they offer most of the benefit of full subtitles, albeit the current research suggests that they do not eliminate the interference effect for visual recall. The area from the center of the screen to right above the subtitles seems to have high potential for visual attention as the eyes repeatedly move back and forth across it; important visual content may be best served by concentrating it within this area.

## Avenues for further research

This research suggests several fruitful avenues for further exploration. For example, how would subtitled commercials fare in a distracted or media-multitasking setting? Prior research and the results of the pre-study suggest that subtitles have an innate attention-grabbing effect, especially when

displayed in content that does not otherwise contain subtitles. Perhaps this attentional capture could increase the effectiveness of commercials when the viewer is distracted, in a social environment, or engaging in media multitasking. Media multitasking is quickly becoming the modal form of media content consumption (Brasel and Gips 2011), and thus any automatic attention-capturing effects that subtitling can create would be beneficial to marketers.

Future work might also explore the interplay among branding within the audio, subtitles, and visual content of the commercial. Prior research has explored repetition of whole commercials (Singh and Cole 1993), but little work has investigated the differential effects of brand repetition in the visual versus verbal portions of a commercial. Would brand name repetition in subtitles show a response pattern more similar to visual or verbal brand repetition? Does the overlap between verbal content and subtitling alter the repetition effectiveness curve, or are the two modalities interchangeable? Connectedly, research might explore whether visual versus verbal memory is inherently more valuable in choice and consumption environments, or perhaps if they have differing levels of importance in traditional versus online contexts.

In addition, future work could explore the effects of same-language subtitling on advertising persuasion. If subtitle processing consumes effort and attention, might subtitles decrease the ability of consumers to generate counter-arguments to persuasive messages? This effect might be more pronounced for more complex messages and advertisements, but using subtitles to potentially decrease counter-argumentation in these contexts must be weighed against the risk of making the ad appear too overwhelming. Follow-up research could also explore how the level of visual complexity in the surrounding media influences the effects of subtitles. For example, consider the different responses to subtitled commercials that might occur when they are placed in a visual information content-dense channel, such as Headline News or ESPN, that contains multiple visual streams of information, versus a more traditional channel. Would the complex visual environment prime a viewer to be receptive to subtitles, or would it bias attention away from commercial subtitles because of visual fatigue?

In conclusion, this work represents an initial exploration into the role of same-language subtitling within commercial content. With many managers questioning the relevance of television advertising and traditional “interruption” marketing, low-cost ways to increase advertising effectiveness should be welcomed. Same-language subtitles in commercials capture visual attention, aid in verbal content retention, and increase brand recall and behavioral intent. These benefits are all at no cost to attitude toward the ad, and they remain even when the subtitles are abbreviated and simplified. Assuming the brand is mentioned in the audio track of the program and

the commercial is not too verbally and visually complex, same-language subtitles represent an easily achievable route to increase traditional advertising effectiveness.

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