Consumers' moment-to-moment processing of television commercials
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8.1 Introduction

A commercial consists of contents that unfold during consumers’ exposure to the commercial; therefore consumers tend to process commercials moment-to-moment, while at the same time having tremendous control to continue or to discontinue watching at each moment of commercial duration. The purpose of this thesis is to understand consumers’ moment-to-moment processing of television commercials in relation to consumers’ evaluations of the entire commercial and to their decision to discontinue viewing during commercial exposure. This thesis develops and illustrates improvements of methodologies to obtain these insights. Specifically, suggestions are made to methods of collecting moment-to-moment processing data during TV commercials and statistical methods to analyze those data to achieve this objective. This chapter summarizes the main conclusions of the previous chapters, discusses managerial implications, and recommends directions for future research on moment-to-moment consumers’ processing of TV commercials.

8.2 Summary

As Figure 1.1 in Chapter 1 shows, in the past and present millions of dollars are spent on TV advertising in Western countries such as 42,040 million U.S. Dollars in the United States and 969 million U.S. Dollars in the Netherlands in 2001. However, Chapters 1 and 2 shows that technical developments such as the remote control, the cable and satellite, the introduction of commercial television and the growing number of television channels, VCR’s and PVR’s have increased consumers’ avoidance of TV commercials. In response to these developments, advertisers have proposed creative message and medium planning strategies to attract and retain consumers’ attention to their commercials. In these strategies, ad contents and message structure play an important role (Chapter 2). By using different and fluctuating ad appeals in the video and audio track, a commercial is structured to attract and retain consumers’ attention and to
elicit a range of consumers’ responses that continuously shift as the commercial unfolds (Chapter 3).

Unfortunately, theoretical frameworks and most previous empirical work explaining the advertising process do not acknowledge this and rely on consumers’ overall retrospective assessments to commercials (Chapter 4). As Chapter 4 reveals, research in psychology that has considered people’s preferences for sequences of hedonic events such as TV commercials suggests that people continuously and ultimately evaluate the sequence differently depending on both the key moments and the pattern of the sequence. In addition, people are able to directly respond in terms of behavioral acceptance of avoidance to a sequence of hedonic events. As Chapter 4 describes, studies in TV advertising show that consumers’ attention, affective and cognitive responses, and behavioral responses continuously fluctuate during commercial exposure, influenced by moment-to-moment commercial and consumer characteristics. In addition, these studies show that consumers’ moment-to-moment processing significantly influence overall ad effectiveness variables, such as persuasion, comprehension, recognition and recall.

However, insights are lacking into how consumers form an overall response to the entire commercial based on their different moment-to-moment responses during commercial exposure. Also, Chapter 4 demonstrated that previous research on consumers’ moment-to-moment affective and cognitive responses during commercial exposure, forced consumers to watch TV commercials in their entirety and yet, did not provide understanding when and why consumers stop watching TV commercials. Research investigating consumers’ attention to TV commercials used behavioral measures of overall amount of attention to the TV commercial (e.g., exposure times, measures whether consumers really look at the screen, water pressure, electrical demand and physiological responses) and allowed consumers to stop watching a commercial, whenever desired (see Chapter 4). However, also these studies did not give insights into how different dimensions of moment-to-moment ad contents and consumers’ moment-to-moment attention and moment-to-moment responses to them affected consumers’ decisions to stop watching a commercial. In Chapter 4 several instruments were described that have been used in previous advertising research to measure
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transformed into humor responses (Alden et al. 1999; Alden et al. 2000; Raskin 1985). The second and third study allow consumers to stop watching a commercial during exposure.

The first study shows the positive effects of the level and velocity of entertainment value, and negative effects of those of information value on consumers’ likelihood to stop watching a TV commercial. Then, the second study shows the intriguing finding that the entertainment and information value had a strong multiplicative effect on the probability to stop viewing. That is, a high entertainment value decreased and a high information value increased the probability to stop watching, but a combination of high entertainment and information value increased the probability to stop viewing a commercial most. This effect is explained from the interplay between top-down and bottom-up processing strategies of consumers.

By the use of eye movements, the third study explicitly measures consumers’ moment-to-moment focus of attention to the brand name, a key element in TV commercials. It shows how consumers’ identification of a familiar brand name, in foveal and parafoveal vision during commercial exposure motivates them to stop watching the commercial. The consumer’s first identification of the brand name especially increases his/her probability to stop watching. This finding is explained from theories that investigate people’s curiosity: Consumers’ levels of curiosity about which brand is communicated in the commercial drop at the moment of brand identification. This effect can also be explained from the schema-triggered affect theory, which states that consumers rely on overall assessments when identifying a familiar brand, which motivates them not to pay attention to further information in the commercial. Every other brand identification after the first identification may increase consumer’s likelihood to discontinue viewing because additional brand name appearances confirm consumer’s hypothesis about which brand is advertised making curiosity levels drop, or brand name appearances do not teach the consumer significant more information. The third study also finds a marginal simultaneous effect of brand name identification and time on consumers’ probability to stop watching a commercial: When consumers identify the brand name late to the end in the commercial, consumers’ likelihood to stop increases more than in the case of an early brand identification.
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Although the second study shows that two more abstract measures of moment-to-moment ad contents influence consumers’ viewing behavior, the third study provides more insights how an important concrete dimension of moment-to-moment information increases consumers’ likelihood to stop watching a commercial. Therefore, the third study provides advertisers with more detailed moment-to-moment information that may help the design of their commercials in order to retain consumers’ attention to the end. It may also be reasoned that the first study investigates two more concrete dimensions of moment-to-moment entertainment, but then with another study objective, namely to increase overall perceived humor of a single commercial. The two studies that allow consumers to stop watching commercials reveal the non-monotonic character of consumers’ overall amount of attention to the commercial over time in terms of fluctuating likelihoods to stop watching during exposure. The last study provides further insights whether consumers have really paid attention to a specific ad dimension (brand name) during commercial exposure and how this is related to behavioral decisions of attention in terms of avoiding a commercial. One of its intriguing findings is that consumers’ identification of the brand name in parafoveal vision significantly increases their likelihood to stop watching the commercial. This result confirms other studies that emphasized people’s capability to decide on the basis of parafoveal information about whether a stimulus is a target or not (Gould 1967; Williams 1967).

8.3.2 Methods
The three studies improve and develop methodologies in terms of methods of data collection and models of analysis in TV advertising research. Because of potential confounding effects and measurement instruments, all three studies use an experimental setting. The studies also employed independent samples of individuals who assessed the commercials on moment-to-moment ad contents and another group who gave overall responses in the first study or whose viewing behavior was observed in study 2 and 3. This was done, because it was too strenuous, if at all possible, for consumers to reliably perform all tasks simultaneously. In the last two studies, natural exposure conditions were better simulated by placing consumers in control of exposure durations and by presenting target commercials amid other stimuli that compete for consumers’
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attention. The average percentages of commercials to be stopped watching were 60% in the first experiment (used in study 2 and 3) and 76% in the second experiment (used in study 2). In the experiment, used in study 2 and 3, the commercials were inserted in pods surrounded by a TV program, better simulating a natural setting, which may explain the lower percentages of stopping. The percentages of commercials to be stopped viewing in our studies are higher than the zapping rates reported in more “natural” studies using people meters (e.g., Danaher 1995, Siddarth and Chattopadhyay 1998; Van Meurs 1998b). However, the percentages found in the two studies are in line the findings of a recent study by CNW Marketing Research (Friedman 2002) indicating that 72.3% of PVR owners skip commercials. This may suggest that our experiments slightly overestimate “natural” viewing behavior. However, the experimental settings used in the three studies correspond to situations in which TV commercials are regularly pretested (Aaker et al. 1992), our study 2 and 3 did not force consumers to be exposed to the entire commercials, and measurement instruments required a laboratory setting.

The first two studies used a computerized version of the “feelings” meter to measure moment-to-moment ad contents and responses. They showed that this instrument is very well applicable in distinguishing between different moment-to-moment ad dimensions, such as more abstract contents in the second study (entertainment and information value) and more concrete responses in the first study (surprise and humor). Therefore our research expands the use of the “feelings” monitor to measure other moment-to-moment responses than only moment-to-moment liking and warmth and extend the studies of Alwitt et al. (1993) and Alwitt (2002) that used the “feelings” monitor to measure evoked moment-to-moment affective, cognitive, fearfulness and hopefulness responses. Then, the third study is the first study in marketing to use eye movements in TV advertising. It showed an infrared corneal reflection technique with lenses tightly fitted on cornea of respondents’ eyes. It described that by precise measurement techniques and the use of judges, consumers’ eye movements and the brand presence, size and location are identified and synchronized. Although this technique worked quite well, more innovative eye tracking techniques (see Duchowski 2003) may give even more exact measurement. Study 3 found an average fixation duration of 0.28 seconds,
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which corresponds to the average length of fixations between 0.2 and 0.3 seconds found in other studies in experimental and natural settings (e.g., Haber 1976; Kroeber-Riel 1992, 1993; Land 1992; Loftus and Mackworth 1978; McConkie 1983; Rayner 1998; Rosbergen et al. 1997).

Then, the first two studies suggested to apply functional data to obtain the “best” representative moment-to-moment trace for one commercial obtained from moment-to-moment response curves of more judges. In previous research investigating moment-to-moment responses, the raw moment-to-moment responses have been averaged across judges to obtain a global moment-to-moment trace for each commercial. Such an approach assumes that each moment-to-moment measure of a particular judge is assessed reliably, and that the judges perform equally well for each commercial. However, moment-to-moment measures of each judge contain unreliabilities due to, e.g., small jitters and involuntary movements. Functional data analysis is the appropriate method to deal with these problems in TV advertising (see also Ramsay and Silverman 1997). Study 1 and 2 showed that application of functional data analysis results in a weighted “smoothed” functional (e.g., humorous) trace, from which levels and velocities of the responses were obtained at every point of time in the commercial length. These levels and velocities were either the input for multivariate analyses (Study 1) or a hazard model (Study 2) and support for the hypothesized effects was found. Therefore, functional data analysis provides a reliable method to analyze the consensus of consumers (or judges) in dynamics of ad contents and ad-evoked responses to them.

In the second and third study we presented a random-effects hazard model to estimate the probability that a consumer stops watching the commercials at a certain time point during commercial exposure. At the same time the hazard model takes differences across consumers and commercials into account. Our modeling approach shows how the dynamics in ad contents in terms of levels, velocities, interaction between them (Study 2), and consumers’ moment-to-moment attention to the brand continuously shift the consumers’ likelihood to stop watching the commercial. Therefore, it provides insights into when and why consumers stop watching during exposure to a single TV commercial. In the third study we provide a new methodology to model consumers’ parafoveal vision of consumers.
We apply an Empirical Bayesian technique to “smooth” the eye fixation observations to “define” the size of the visual field of each consumer for every commercial, based on average saccade lengths from fixation \( n - 1 \) to \( n \) (see also Bertera and Rayner 2000). Then we use basic statistical procedures to compute consumers' moment-to-moment probability to identify the brand name during commercial exposure. Our approach takes into account that 1) the visual field differs across consumers and commercials, 2) the visual field may be asymmetrical in the direction of the next eye movement, 3) consumers' processing ability declines outside this region and 4) larger brand name surfaces have higher probabilities to be processed. Because our study and previous research confirm that consumers are able to make behavioral decisions based on information in the parafoveal vision (Gould 1969; Williams 1969) and eye movements are a reliable method to measure consumers’ moment-to-moment focus of attention to commercial properties, our approach provides a good manner to compute moment-to-moment consumers’ probabilities to identify various commercial properties in foveal and parafoveal vision.

In conclusion, the experimental settings, instruments to collect data on consumers’ moment-to-moment processing of commercials, and methodologies in the three experiments enhanced our understanding of the effects of moment-to-moment ad contents and consumers’ moment-to-moment processing of them on overall retrospective responses of entire commercials and consumers’ decisions to stop watching a commercial. The experiments reported in this thesis did not solve all limitations of previous studies in which consumers’ moment-to-moment processing was assessed, but the developed methodologies provide new avenues to improve future research in TV advertising.

### 8.4 Managerial implications

Failure to attract and retain consumers' attention to an individual TV commercial reduces the effective reach of the commercial endangering the attainment of other communication and marketing goals. Also when consumers decide to watch the entire commercial, moment-to-moment assessments during exposure affect consumers’ overall evaluations of the
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commercial, which may directly influence specific communication and marketing goals. Advertisers’ message and medium planning strategies often consist of changing moment-to-moment content aspects of their TV commercials (e.g. humor, sexual and “shock” appeals) or force consumers to watch entire commercials (e.g., roadblocking).

However, insights into how these moment-to-moment changes influence consumers’ viewing behavior and overall commercial assessments are lacking. Such insights are important in view of the staggering levels of commercial clutter, the substantial financial costs involved in the production and airing of television commercials, the increasing zapping rates and the resulting potential losses of commercial effectiveness. This research increases advertisers’ understanding of the influence of moment-to-moment ad contents on consumers’ attention, their decisions to stay or leave at every moment during the course of the commercial and on overall consumers’ assessments when being exposed to the entire commercials. Although the main objective of this thesis was to obtain these insights by developing and improving methodologies used in previous studies on moment-to-moment consumers’ processing of TV commercials, one should be careful in attempting to generalize the empirical results. Still, several managerial implications can be formulated on the basis of the results of the three studies reported in this thesis. Our findings have implications mainly for message structure decisions and managerial ad testing research.

8.4.1 Message structure decisions

Because ad contents significantly influence, through mediating processes, consumers’ decisions to stop watching a commercial at every moment of its duration, advertisers should pay close attention to the content architecture of their commercials as part of a message strategy. Using two main dimensions of ad contents, advertisers should communicate a high entertainment value to retain viewers, while in addition positive increases in the entertainment value over time further serve that purpose. Both the level of information and the speed at which it is presented affect consumer retention negatively. Thus, the amount of information and the speed with which it is presented should be carefully controlled in commercials. But, moreover, advertisers would be ill advised to increase the overall
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entertainment value at those moments in the commercial that it is highly informative, or conversely to increase the entertainment value to mitigate the negative impact of momentary high information content on consumers' probabilities to stop watching. In fact, simultaneously high levels and velocities of entertainment and information value have a potentially severe "boomerang" effect on probabilities to stop viewing commercials.

Being more abstract measures of ad contents, entertainment and information value consist of specific ad features, that are more managerial controllable to achieve certain communication objectives. In addition, eye tracking makes it possible to measure consumers "real" attention to specific concrete ad features. The third study shows that consumers' attention patterns to a key ad feature, namely the brand, significantly influence decisions to stop viewing a commercial at a specific point in time. More specifically, consumers' identification of the brand name in foveal or parafoveal vision negatively influences the likelihood to view a commercial, especially when the brand name is identified for the first time. The results in the third reveal that consumers' eye tracking patterns to the brand name appearances in a particular TV commercial enable advertisers to predict consumers' moment-to-moment viewing behavior. Based on these results, advertisers are able to change the branding structure of an individual commercial to retain consumers to the end of this commercial. So, if the objective is to retain consumers to the end of the commercial, advertisers are recommended to delay consumers' brand identification until the end of the commercial. This can been done by presenting the brand name later in the commercial, stimulating consumers to selectively seek information about which brand is communicated in the commercial. Another strategy would be including distracter elements in the commercial in order to prevent consumers from identifying the brand name immediately when it is presented more times during commercial duration.

If consumers indeed decide to watch the commercial in its entirety (or when they are forced to do so in the case of, for example, roadblocking as part of a medium planning strategy) and the advertisers' communication objective is to increase overall perceived humor ratings, the timing and peak level of surprise during exposure are key elements in maximizing the overall humorous response in consumers. Specifically, advertisers would be well advised to draw out the suspense in the ad (i.e., delay the point of
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peak surprise) as much as possible in the ad. Further, when the peak of surprise precedes the peak of humor, the greater the humorous response. From a practical perspective, this finding provides a guideline for creating effective humorous ads, namely that ads would be developed and tested for their ability to produce a delayed, and heightened surprise reaction that precedes the peak in humor. In addition, marketers can use the results of the present studies to engineer profiles of moment-to-moment humor that have been shown to maximize the level of overall humor. Specifically, humorous ads should be constructed to have high peak and final moments of humor, and a positive slope of humor.

8.4.2 Managerial ad research

Because consumers' have tremendous control over each moment they watch TV commercials, copy pretesting is challenged to evaluate the potential effectiveness of TV commercials and their success to attract and retain consumers’ attention and to elicit the intended consumers’ responses at each moment of their duration. Standard copy test methods frequently rely on an experimental setting in which consumers are forced to watch the entire commercial (imbedded in a TV program) and different categories of overall retrospective responses are collected, such as recognition, recall, persuasion and purchase intention (Rossiter and Percy 1997).

However, our findings reveal that moment-to-moment measurement of key ad dimensions and consumers’ attention to them are necessary to understand when and why consumers stop watching TV commercials and how different ad dimensions may have simultaneous (positive or negative) effects on consumers’ moment-to-moment and overall responses. This thesis improved and illustrated instruments to reliably measure moment-to-moment consumers’ attention using eye movements and moment-to-moment commercial evaluations using the “feelings” monitor. Then it developed statistical models to relate consumers’ moment-to-moment attention and commercial evaluations to their decision to stop watching them and to overall retrospective assessments of the commercials. By integrating our methods into standard copy testing research in advertising, results show exactly when commercials are at danger of being zapped or zipped away, what key determinants of these risky moments are, and which
key moments in moment-to-moment consumers’ responses influence overall commercial evaluation. At the same time, our methodologies and findings open new avenues in refining moment-to-moment copy testing research and relating its outcomes to other ad communication objectives such as creating and increasing category need, brand awareness, positive brand attitude, brand purchase intention and/or purchase facilitation.

8.5 Future research

Apart from conducting replication studies using different commercials and consumers in different settings, several suggestions for future research can be given. More specific recommendations regarding the three studies are found in the discussion sections of Chapters 5 to 7.

Our studies increased insights into how moment-to-moment ad contents and evoked consumer responses influence consumers’ overall responses after commercial exposure and behavioral decision to avoid during exposure. However, as the framework in Figure 4.1 proposed moment-to-moment ad contents influence consumers’ moment-to-moment attention and moment-to-moment affective and cognitive responses and then impact behavioral responses. Our studies did not test the framework as a whole, neither did they test for consumers’ moment-to-moment mediating processes (e.g. moment-to-moment affective and cognitive responses) that influence moment-to-moment behavioral decisions. The same can be said for the first study that did not test the entire framework of Alden et al. (1999; 2000) of how humor works, including moderating effects of playfulness, warmth and ease of resolution and that did not explicitly account for mediating consumers’ internal processes. Our studies share this characteristic with much of the other research in this area, as illustrated by the lively debate about the mediating processes between affective states on the one hand and judgment and decision making on the other hand (Isen 2000; Martin and Clore 2001). The last study does a step forward in this direction and differs from the other two studies because it conceptualized consumers’ moment-to-moment focus of attention. To test for mediating individual processes, research should measure all processes at the individual level, which our experimental setting and instruments did
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not allow for. One could for example use eye movements in combination with physiological measures such as brain waves, GSR responses or facial EMG to measure different attential, affective and cognitive processes at the same time, while a consumer is allowed to stop a commercial whenever desired. In such a way commercials could be manipulated in terms of moment-to-moment ad contents and examine how the manipulations affect the different consumers' processes and their interactions at each moment in the commercial. However, the question is how close this setting is to a natural setting, which affective and cognitive processes may be inferred from physiological measures, which and how processes intervene with each other, and if such an experimental setting is affordable. For future research we recommend to further investigate the different stages and their interactions in the theoretical framework presented in Figure 4.1 and the Alden et al. model (1999; 2000), to examine consumers’ mediating processes and to develop good experimental settings to do so.

The third study is a first step for future research in investigating the moment-to-moment attention stage in Figure 4.1. It shows ideas for conceptualization of moment-to-moment consumers’ attention to commercial properties and to relate this to behavioral decisions. Therefore, another avenue for future research concerns the use of eye movements in TV advertising research. Study 3 focused only on consumers’ visual attention for the brand name, while commercials consist of a lot of different dynamical elements, as Chapter 3 indicates. The methodology proposed in study can be used to measure consumers’ attention to these ad elements and its influence on consumers' viewing behavior.

While we aggregated consumers’ attention to the brand on second-level for purposes of model identification, other aggregation levels are more desired. Other global aspects of attential patterns such as number of fixations, attention duration per ad element and saccade frequencies within and between ad elements could be investigated, which may give additional insights how consumers visually process TV advertising. As also discussed by Rosbergen (1998), previous research has found individual differences in individual scanpaths of people and distinguishes between local scanpaths (i.e., consistent patterns of successive fixations) and global scanpaths (i.e., distribution of fixations among ad elements; Groner et al. 1988; Groner and Menz 1985; Liechty, Pieters, and Wedel 2003). It is intriguing to examine whether people’s scanpaths differ between static and dynamic stimuli and
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also how the design of TV commercial over time influences consumers’ scanpaths. Individual differences and commercial elements such as sound, movement, different camera positions, changing colors that attract and guide consumers’ attention are expected to influence these scanpaths (Aaker et al. 1992; Kroeber-Riel 1993). Further studies, in which TV commercials with varying message structures are used, could provide more insight into the relative importance of consumer- versus commercial-specific determinants of these scanpaths.

Of course consumers need not always view commercials in their entirety to be influenced by them. Consumers who stop viewing a 30-second TV commercial after a few seconds may still have been exposed long enough to the brand and the key message to learn about the brand. However, there is evidence that stopping TV commercials before their natural end does erode their effectiveness in terms of lower brand recall and recognition (Tse and Lee 2001). Moreover, if the relevant information and associations in the commercial follow an early identification of the brand, consumers’ attitude toward the brand may suffer seriously, if they stop before being exposed to the information and associations (see Chapter 9). The same argument can be used for the placement of brand information in a humorous commercial. It may be questioned whether and how the placement of brand information and different features of the moment-to-moment surprise and humor traces impact consumers’ overall perceived humor ratings and how this affects other ad effectiveness variables.

Thus, possible down-stream detrimental effects of prematurely stopping a commercial or consumers' overall responses depend very much on the specific communication objectives and the internal structure of the commercials, which we believe are important issues for future research. This will provide further insights into the momentary content of television commercials, the mediating processes, the moment-to-moment decisions that consumers make and their overall responses that determine the success and failure of television commercials and the brands that they feature. One of the main questions that could be addressed is whether and how changes in important overall ad effectiveness variables are related to moment-to-moment responses of consumers towards the commercials such as focus and amount of attention to ad contents, affective and
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cognitive responses, and the moments at which consumers decide to stop TV commercials. Then, these outcomes should be integrated into research to relate consumers’ moment-to-moment processing of TV commercials to more general communication objectives such as creating and increasing category need, brand awareness, positive brand attitude, brand purchase intention and/or purchase facilitation.
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consumers’ moment-to-moment attention and moment-to-moment processing during exposure to TV commercials. It concluded that the “feelings” monitor is an inexpensive instrument that has been validated to directly measure moment-to-moment (evoked) affective and cognitive responses that differ in dimension, direction and intensity. It also revealed that no study to date has investigated consumers’ moment-to-moment focus of attention to commercial contents and that eye movements are a reliable measure to do so. The three studies presented in Chapters 6 to 8 develop methodologies to increase the understanding of these niches in TV advertising research.

8.3 Insights and methodologies

The three studies presented in this thesis provide new insights into consumers’ moment-to-moment processing of TV commercials and they develop methodologies to obtain these insights. These insights and methodologies are discussed in the following sections.

8.3.1 Insights

The key findings in the three experiments is that ad contents fluctuate over time and have significant effects on consumers’ overall responses, directly made after the commercial and behavioral decisions to avoid the commercial during exposure. Not only main effects of moment-to-moment ad contents are found, but also simultaneous effects of different moment-to-moment ad dimensions are revealed and significant influence of the speed in ad contents is found. The first study extends the Baumgartner et al. (1997) for moment-to-moment humor in relation to overall perceived humor. Results indicate that higher overall humor is associated with a higher peak, final moment, and average velocity of the MTM humor trace. Then, it also reveals a simultaneous effect of moment-to-moment surprise and humor on overall perceived humor: Overall perceived humor for a commercial is higher when the peak in MTM surprise precedes the peak in MTM humor, when there is a high correlation between MTM surprise and MTM humor, and when MTM surprise peaks relatively late in the ad. These findings are explained from the incongruity-resolution theory of the working of humor, which state that responses of surprise should precede before and
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