Consumers' moment-to-moment processing of television commercials
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Chapter 6
The Influence of Moment-to-Moment Entertainment and Information Value on Commercial Avoidance

6.1 Introduction

As Chapter 2 shows various technological innovations have increased consumers’ control over television and commercial exposure enormously. This challenges program-makers and advertisers more than ever to retain consumers’ attention at every key moment during the course of a television commercial, which necessitates them understanding how the moment-to-moment content of commercials affects this. Yet, we know very little about the influence of the moment-to-moment (MTM) content of commercials on consumers’ decisions to continue or discontinue exposure to commercials. Some research has explored the influence of overall features of commercials and consumers on viewing behavior (e.g., Olney et al. 1991; Siddarth and Chattopadhyay 1998; Woltman Elpers 2000; Woltman Elpers and Alsem 2001). In a relevant study, Olney et al. (1991) found for instance, that the overall content of TV commercials affects viewing time. That is, the overall “feelings” induced by a commercial increased and the overall “facts” communicated by a commercial decreased the viewing time. These findings may help advertisers identify which commercials are more or less prone to being zapped, zipped or skipped. However, research on the influence of MTM ad content on consumers’ decisions to continue or discontinue watching a commercial is scarce. Insight into the effects of MTM ad content is important, since it may identify not only which specific

45 This chapter is based on the article: Woltman Elpers, J.L.C.M., M. Wedel and F.G.M. Pieters, “Why Do Consumers Stop Watching TV Commercials? Two Experiments on the Influence of Moment-to-Moment Entertainment and Information Value”, forthcoming in the Journal of Marketing Research, November 2003. Parts of this research can also be found in Woltman Elpers (2002), Woltman Elpers, Pieters, and Wedel (2001) and Woltman Elpers, Wedel, and Pieters (2002). We would like to express our gratitude to Dominique Claessens of Verify International for providing us the viewing behavior data, Hans Baumgartner for the software to measure moment-to-moment ad contents, and Frank Harleman and Margon Pelken for their help in data collection for this research.
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Commercials fail to retain consumers until the end, but also when and why during their exposure this occurs. This may provide guidelines in how to retain consumers’ attention during commercial exposure, and it may add to our understanding of on-line advertising processing and its resulting effectiveness (Alwitt et al. 1993; Baumgartner et al. 1997; Hughes 1990).

The research in this chapter focuses on two main dimensions of the MTM content of commercials that are hypothesized to influence consumers’ decisions to continue or discontinue exposure to the commercials: entertainment value and information value. It is the first study to examine this, and aims at making both a substantive and a methodological contribution. Specifically, we delineate the independent and joint effects of moment-to-moment entertainment and information value on consumers’ decisions to continue or discontinue exposure to television commercials. We offer specific hypotheses on the potential compensatory and conflicting effects of entertainment and information value on these decisions, and propose an analytical approach to investigate them. Our hypotheses are based on recent developments in emotion and ad processing theories and our results extend them. In addition, we propose a novel functional data analytic approach to represent multiple MTM ad content measures (see also Chapter 5) and apply a random effects discrete time hazard model, which accounts for heterogeneity across consumers and advertisements, to identify their effects on decisions to continue or discontinue exposure to commercials. In this chapter, we report the results of two laboratory experiments to determine the stability of the effects across different consumers, commercials and exposure contexts.

The next sections describe the conceptual background of the research, our hypotheses, data collection and analysis methodology. Then, the results of the two experiments are presented. In the final section we discuss the findings and offer recommendations for advertising and suggestions for future research.

6.2 Entertainment and information value

Following previous work in advertising (e.g., Aaker et al. 1986; Schlinger 1979), we define entertainment value (EV) as the extent to which a specific
moment in a commercial contains amusing, warm, or playful material. Similarly, we define information value (IV) as the extent to which a commercial provides facts, news, arguments, product attributes and benefits (Aaker and Norris 1982; Puto and Wells 1984; Resnik and Stern 1977). Closely related dimensions have been distinguished in other fields e.g., the think-feel distinction of products and consumption patterns (Claeys, Swinnen, and VandenAbeele 1995), the informational-transformational distinction in advertising (Puto and Wells 1984) and purchase motivation (Rossiter, Percy, and Donovan 1991), and the facts versus feelings distinction of persuasive messages (Holbrook 1978). In addition, the two dimensions of EV and IV commonly emerge in factor-analytic studies of advertising content (e.g., Lastovicka 1983; Olney et al. 1991; Schlinger 1979). Moreover, Barwise and Ehrenberg (1988) identify EV and IV as essential factors of television program content. Finally, these dimensions are identified by advertisers and agencies to be important (Biel 1998; for an overview see Batra, Myers, and Aaker 1996), and appear to be monitored by consumers during ad exposure (Aaker et al. 1986; Polsfuss and Hess 1991).

We propose that the use of moment-to-moment measures of EV and IV provides insights into the decisions of consumers to continue or discontinue viewing commercials, beyond those obtained by measures of the commercials' content as a whole. Our reasoning is based on findings in emotion and utility theory described in Chapter 4 (Aaker et al. 1986; Baumgartner et al. 1997; Frederickson and Kahneman 1993; Kahneman 1999; Varey and Kahneman 1992). Such research demonstrates that the utility of events after they have occurred is influenced by specific key moments during the events, such as the peak and end. It shows that the overall "post-process" utility of an event is not necessarily an additive sum of the MTM "in-process" utilities, which is also shown for humor responses to TV commercials in Chapter 5. In other words, although much can be learned from overall summary measures of EV and IV after commercials have been watched completely, consumers evidently cannot base their decisions during exposure to a commercial on these post-exposure values. We believe that the MTM values are essential, because they determine whether and why consumers continue or discontinue exposure to commercial content. That is, we argue for a detailed analysis of how the two key dimensions of the content of TV commercials, EV and IV, evolve
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over time, and will specify how these two dimensions will affect consumers’
decisions to continue or discontinue exposure to commercials at each
specific point in time.

*Figure 6.1: Level and velocity in the entertainment and information value trace of
TV commercials*

Before we offer our hypotheses, Figure 6.1 first presents a hypothetical
trace of the MTM content (entertainment or information value) of a
commercial and two indicators of this momentary content that can be
derived from it. Specific hypothesis for these indicators will be offered. In
Figure 6.1, time is on the horizontal axis and the absolute level of EV or IV
is on the vertical axis. The first indicator is the *absolute level* of the
entertainment or information value in second $t$, defined as the outcome of
the value trace in second $t$. The second indicator is the *velocity* in second $t$. 

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defined as the rate at which the trace changes in second $t$, the first-order derivative. Positive velocities indicate that the trace is moving up, and negative velocities that it is moving down. There are reasons, discussed below, to expect that both the level and the velocity of the value trace influence consumers’ decisions to continue or discontinue exposure to a particular commercial at point $t$.

6.3 Hypotheses

First we offer our hypotheses about the main effects of the levels of EV and IV, and next about their interactive effects. Then, predictions about the influence of the velocities in IV and EV are provided.

6.3.1 Influence of EV and IV level

Consumers generally prefer entertaining events and are motivated to prolong them (Isen 2000; Kahneman 1999). Chaiken and Eagly (1983) and others (e.g., Biel 1998) suggest that while high levels of information may be valued in print advertisements, entertainment is more important for TV commercials. In support of this, television in general appears to be watched mainly for entertainment, to relax, to “kill” time, or “to escape from worries” (Barwise and Ehrenberg 1988). Recall that Olney et al. (1991) found the overall positive “feelings” induced by commercials to increase the viewing time of TV commercials. We expect this to hold also for each specific moment-to-moment level of entertainment value. Hence,

H1: A high level of EV decreases the likelihood to stop viewing a TV commercial.

We predict an opposite effect for the MTM level of information value. Research (Berlyne 1974) has shown that people look longer at static stimuli, such as paintings, that contain more information. Consumers also look longer at original, informative (static) print advertisements than at unoriginal advertisements, in particular at their pictorials (Pieters et al. 2002). This might suggest that a high level of IV also decreases the likelihood to discontinue watching a TV commercial. However, we conjecture the opposite relationship for the IV level of television advertising, because commercials are dynamic, externally controlled, rather than static
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and internally controlled, stimuli, and because of their function to consumers. While consumers can inspect print advertisements at their own pace, the information rate of TV commercials is externally paced and this gives consumers less control over information intake (see also Section 3.2). Thus, at higher levels of IV in commercials, the information processing capabilities of consumers may quickly become overtaxed, in particular since they tend to watch commercials more passively (Krugman 1965b), and for entertainment rather than information (Barwise and Ehrenberg 1988). In support of our reasoning, high levels of information in commercials have been shown to cause irritation (Pasadeos 1990). One strategy to cope with high levels of information in commercials is to discontinuing being exposed to them. Therefore, we propose:

H2: A high level of IV increases the likelihood to stop viewing a TV commercial.

6.3.2 Influence of the interaction of EV and IV level

Empirical corroboration of hypotheses 1 and 2 would suggest additive effects of EV and IV on the likelihood to stop viewing commercials. In that case, sufficiently increased levels of EV in commercials could compensate a rise in the likelihood to stop viewing due to higher levels of IV. However, we believe that higher EV levels conflict with higher IV levels, such that the probability to stop viewing a commercial is highest when the levels of EV and IV are simultaneously high. This prediction is based on the following reasoning.

First, pleasant moods and events, such as a high EV, reduce the motivation and ability to process detailed information (Mackie and Worth 1991; Schwarz 2001). A reduced motivation and ability to process due to a high EV of commercials, in combination with a high IV may therefore even more rapidly overtax consumers, which may promote the decision to stop exposure to the commercial. This prediction is in line with the conclusion of Jacoby (1984) about information overload. He argued that while consumers can be overloaded, generally speaking they will not be: “This is because they are highly selective in how much and just which information they access, and tend to stop well short of overloading themselves” (p. 435).
Second, there is increasing evidence from a related stream of research that consumers have access to different processing styles that may be incompatible at any specific point in time (e.g., Bless 2000; Fiedler 2000; Forgas 2000, 2001). Specifically, a high EV of the commercial content favors a top-down processing strategy, in which consumers rely on their general knowledge structures and free associations. On the other hand, a high IV of the commercial content requires a bottom-up processing strategy, in which the data and details in the message are focused on. Although these processing styles are not mutually exclusive (Fiedler 2000; Forgas 2001), they do pose conflicting demands on consumers. This is particularly the case when EV and IV levels are both high. Since consumers cannot control the information rate of TV commercials, one solution to cope with these conflicting processing demands is to avoid exposure to the commercial altogether. Based on this reasoning, we predict:

**H3**: High levels of EV combined with high levels of IV increase the likelihood to stop viewing a TV commercial.

### 6.3.3 Influence of EV and IV velocity

We predict similar effects of the velocity of EV and IV, independent of the effects of EV and IV level. This is based on the following reasoning. As Section 4.2.2 shows, there is empirical evidence that not only the level but also the velocity of moment-to-moment evaluations of experiential content influences global assessments of the content (Varey and Kahneman 1992; Ross and Simonson 1991; Hsee and Abelson 1991). One explanation is that independent of its level, an increase in a favorable hedonic judgment is liked intrinsically (an unfavorable judgment is disliked). That is, people are sensitive to deviations from the “average” hedonic tone, and like such positive and dislike negative deviations (Frederick and Loewenstein 1999; Helson 1964). If such a mechanism holds for viewing commercials, it would imply that independent of the level of EV or IV, to which consumers may become adapted, changes in the levels affect the decision to continue or discontinue exposure to commercials as well. Indirect support for this prediction comes from a study by Baumgartner et al. (1997) and Chapter 5, that found that the post-exposure overall likeability, respectively humor response for TV commercials was significantly correlated with the slope of
the MTM likeability, respectively MTM humor trace. While there is little direct theoretical support or empirical evidence, we suggest the following predictions about the main and multiplicative effects of velocity in MTM EV and IV:

**H4:** A positive velocity of EV decreases the likelihood to stop viewing a TV commercial.

**H5:** A positive velocity of IV increases the likelihood to stop viewing a TV commercial.

**H6:** Positive velocities of EV and positive velocities of IV together further increase the likelihood to stop viewing a TV commercial.

Empirical support for all six hypotheses would show that both the level and velocity of EV and IV influence moment-to-moment decisions to continue or discontinue exposure to TV commercials, and that high levels and velocities of EV and IV are incompatible.

### 6.4 Data collection

It would be too strenuous, if at all possible, for consumers to indicate when they want to stop watching a commercial and simultaneously to give measures of both the MTM entertainment value and information value for it (Larsen and Frederickson 1999). Therefore, we employed independent samples of individuals for each of those tasks and additional samples of individuals to assess measures that were used as controls in the analyses (e.g., Holbrook and Lehmann 1980; Olney et al. 1991; Pieters et al. 2002). Also, to test the stability of the findings, we conducted two separate experiments. As described next, while the basic design of the two experiments is similar, they differ in several features of the experimental design and the data collection, specifically the two experiments differ in (1) number and nature of the commercials, (2) measures of ad familiarity (assessed from independent judges or consumers), and (3) context of commercials (surrounding TV programming material or not). In view of these differences, it lends credence to the results to find systematic support for hypotheses across the two experiments.
Table 6.1 gives an overview of the number of stimuli, consumers and judges used in each experiment. Next we describe the data collection procedure and point out specific differences between the two experiments. These differences are also presented in Table 6.1.

### Table 6.1: Data collection design in both experiments

<table>
<thead>
<tr>
<th></th>
<th>Experiment 1</th>
<th>Experiment 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Target stimuli</strong></td>
<td>18 commercials</td>
<td>27 commercials</td>
</tr>
<tr>
<td><strong>Product categories in target stimuli</strong></td>
<td>Beverages, alcoholic drinks, banking services, detergents, shaving-soap products, sanitary towels, airline companies, snacks, soap products, telecommunication products, supermarkets, cars, coffee.</td>
<td>Beverages, yoghurts, snacks, daily food, alcoholic drinks, supermarkets, paper products, detergents, pet food products, medicines, perfume, soap products, personal care products, financial services, travel agencies, gas stations, music CD’s, photo and video camera’s, telecommunication products.</td>
</tr>
<tr>
<td><strong>Filler stimuli</strong></td>
<td>No</td>
<td>14 commercials</td>
</tr>
<tr>
<td><strong>Other TV programming</strong></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td><strong>Viewing behavior</strong></td>
<td>71 consumers</td>
<td>119 consumers</td>
</tr>
<tr>
<td><strong>MTM entertainment value</strong></td>
<td>20 judges</td>
<td>20 judges</td>
</tr>
<tr>
<td><strong>MTM information value</strong></td>
<td>20 judges</td>
<td>20 judges</td>
</tr>
<tr>
<td><strong>Overall Uniqueness</strong></td>
<td>20 judges</td>
<td>20 judges</td>
</tr>
<tr>
<td><strong>Overall familiarity</strong></td>
<td>20 judges</td>
<td>119 consumers</td>
</tr>
<tr>
<td><strong>Familiarity measured on consumers</strong></td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### 6.4.1 Stimuli

Respectively 18 (exp.1) and 27 (exp.2) TV commercials aired on Dutch television were used as target stimuli in the experiments. The commercials represent a broad range of product categories and brands (Table 6.1). Commercial lengths ranged from 15 to 40 seconds (exp.1: $M = 24$, $SD = 6$; exp.2: $M = 29$, $SD = 7$). In addition, 14 filler commercials for a range of products were used in experiment 2.
6.4.2 Viewing behavior for TV commercials

A sample of respectively 71 (exp.1) and 119 (exp.2) consumers between 18 and 60 years participated in the experiments conducted by Verify International, a market research company. In both experiments about 50% of the participants were male. Consumers were seated in a comfortable chair in a quiet room and watched the commercials individually on a 21-inch television monitor. The instruction in both experiments was: “You will see various commercials. If you would like to stop watching any commercial, you can do so by pushing the button in front of you.” In experiment 1, commercials were shown in pods of 3 to 4 with unrelated program material in-between pods. In experiment 2, commercials were shown one after the other to each consumer. The order of the commercials was randomized across participants in both experiments. Although our studies do not enable a consumer to skip the entire commercial pod and expose all consumers to the start of each commercial, stopping to watch a TV commercial in our experiments agrees most closely with skipping behavior, but partially overlaps with zapping and zipping as well (see Section 1.2). In experiment 1, immediately after stopping a commercial or after the end of a commercial the consumer was exposed to the next commercial or program. Yet, consumers in experiment 2 were immediately asked to assess their familiarity with the specific commercial, that is: “How often have you seen this commercial before” on a 3-point scale (1 = never, 2 = sometimes, 3 = often) by using a touch screen. After answering this question the next commercial appeared on the screen. For all consumers in experiment 1 and 2, the duration of exposure to each commercial was recorded in seconds. The overall viewing time of consumers ranged from respectively 1 to 10 minutes in experiment 1, and from 5 to 18 minutes in experiment 2. Consumers in experiment 1 watched on average 6 minutes in total (SD = 2), and consumers in experiment 2 watched on average 10 minutes (SD = 3). After finishing, consumers participated in other experiments, unrelated to the present one. They were paid the equivalent of $30 for their participation.
6.4.3 Moment-to-moment entertainment value

Two independent samples of 20 trained\textsuperscript{46} MBA students (10 males and 10 females) assessed the MTM EV of the respectively 18 (exp.1) and 27 (exp.2) commercials, using the methodology developed by Baumgartner et al. (1997; see also Chapter 4 and 5). The scale ranges from “very unentertaining” (0) to “very entertaining” (600). Judges saw the commercials on a computer monitor and were instructed:

“To assess to which extent a commercial creates entertainment value. The entertainment value of a commercial is high if it contains entertaining, warm and playful material that makes the commercial pleasant to watch.”

After judges had (re)familiarized themselves with the measurement procedure, the target commercials were shown in random order. Unrelated bogus commercials were inserted after each target commercial to avoid carry-over effects. Short breaks between sets of commercials were scheduled to minimize fatigue. The task took approximately 2 hours in experiment 1, and 2.5 hours in experiment 2 to complete. Judges were paid the equivalent of $30.

6.4.4 Moment-to-moment information value

Two other, independent samples of 20 MBA students (10 males and 10 females) assessed intended MTM IV of the respectively 18 (exp.1) and 27 (exp.2) commercials using the same procedure and methodology as for EV. The scale ranges from “very uninformative” (0) to “very informative” (600). Following Resnik and Stern (1977), judges were instructed:

“To assess the extent to which commercials are informative. A commercial is informative if it contains one or more of the following cues about the product, service, or institution: price or value, quality, performance, components or contents, availability, special offers, taste, packaging or shape, guarantees or warranties, safety, nutrition, independent research, company-sponsored research and/or new ideas. The more it contains these cues, the more informative the commercial is. If the commercial contains other cues than these, it is not informative.”

\textsuperscript{46}The students finished an advanced course in marketing communications and advertising and followed a special lecture about MTM measurement of ad contents.
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Judges were instructed not to evaluate whether they personally felt the information was relevant to them, but to what extent (un)informational cues were present. In experiment 2 judges received the list of information cues prior to participating in the study.

6.4.5 Covariates: Uniqueness and familiarity of commercials
To control for variables that may potentially co-vary with the key variables, two other, independent samples of trained MBA students (10 males and 10 females) independently assessed the overall uniqueness as part of ad contents of each commercial in the two experiments (following Olney et al. 1991; Pieters et al. 2002). Overall uniqueness was assessed with five items each on a 7-point scale from "very little" to "very much" (single item alpha's across judges in parentheses): different from any other commercial (exp.1: .80; exp.2: .98), novel (exp.1: .76; exp.2: .98), ordinary (exp.1: .71; exp.2: .98), surprising (exp.1: .70; exp.2: .95) and original (exp.1: .73; exp.2: .97). The overall multi-item alpha across items and judges was respectively .95 in experiment 1 and .99 in experiment 2. As for the other samples of judges, the order of commercials was randomized, non-target commercials were interspersed, and short breaks were scheduled in between sets of commercials. Scores were averaged across items (after reverse coding "ordinary") and judges to obtain an overall uniqueness score for each commercial. In experiment 1, ad familiarity was collected by a final sample of trained students (10 males and 10 females) on a 7-point scale ranging from "very unfamiliar," to "very familiar" (0.96), following the same procedure. In experiment 2, ad familiarity was collected from the same consumers whose viewing behavior was recorded, as described above and indicated in Table 6.1.

6.5 Analysis framework
In this section, the analytic approach, consisting of two stages, is introduced. First, composite representative EV and IV traces are derived for each commercial from the curves provided by each of the judges. To this end, commercials are the units of analysis and judges are treated as replicates in a functional data analysis (FDA). The analysis yields smoothed
and optimally weighted traces for each commercial with a level and velocity per second. Second, commercials and consumers are the units of analysis in a random-effects hazard model to investigate the effects of EV and IV levels and velocities on the probability to discontinue exposure to a commercial.

6.5.1 Functional data analysis for EV and IV curves
Because of reasons described in the previous chapter, we propose to use Functional Data Analysis (FDA) to arrive at a moment-to-moment trace for each commercial (Ramsay and Silverman 1997). As explained in detail in the Appendix of Chapter 5, it proceeds in two stages. First, each individual EV/IV curve is smoothed using local polynomial regression of second degree with own bandwidth parameter for each judge (Fan and Gijbels 1996; Ramsey and Silverman 1997). In the second stage, we derive a single EV/IV trace per commercial, from the weighted curves of the individual judges. These weights are estimated with a Principal Component approximation of the covariance matrix of the EV/IV traces pooled across judges (Van Buuren 1991, 1992). The matrix of the EV/IV traces across judges is column-centered. This corrects for potential differences between judges in their average use of the EV/IV scale, but it retains average differences and variability of the individual curves (Van Buuren 1991, 1992; Ramsey and Silverman 1997) between commercials, which is desirable. The weights are standardized post hoc to ensure that the EV/IV levels are standardized across commercials. These weights are used to compute a composite EV/IV trace for each commercial and its first-order derivatives. From this composite trace information about the level and velocity (first order derivative) for each relevant moment in time is derived (see Figure 6.1).

6.5.2 A hazard model for probability to stop viewing
We estimate a random-effects discrete-time hazard model to predict when consumers discontinue exposure to a commercial. Discrete-time hazard models have the advantage in that they lead to simple model formulations, allow for censoring, and include time-varying covariates (Efron 1988).

Let $p = 1,...,P$ consumers, $q = 1,...,Q_p$ the number of one-second intervals that consumer $p$ is potentially exposed to commercial $i$, and $t_{ip}$ be
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the time elapsed since consumer \( p \) has been exposed to commercial \( i \). \( X_{iq} \) denotes the matrix of time-varying covariates (EV and IV level and velocity), and \( Z_i \) the matrix with the time-constant covariates (ad placement, previous frequencies of stopping a commercial, accumulated viewing time, uniqueness and familiarity of the commercials). We use a piece-wise exponential formulation of the hazard (Laird and Olivier 1981), in which the exposure duration to each commercial \( i \) for consumer \( p \) is partitioned into \( Q_p \) one second intervals. The hazard is constant within each second. Events are assigned to the mid-point of these one-second time windows (Petersen 1991). The hazard that commercial \( i \) with features \( X_{iq} \) and \( Z_i \) is stopped by consumer \( p \) in the \( q \)-th second after the start is:

Equation 6.1: 

\[
 h_{iq} = h_{ip}(t_q) = h_1(X_{iq})h_2(Z_i)
\]

\[
 h_{ip}(t_q) = \exp(\alpha_{ip} + \alpha_1 t + \alpha_2 t^2 + \alpha_3 \ln t)
\]

\[
 h_1(X_{iq}) = \exp(\beta_1 \bar{x}_{iq} + \beta_2 \bar{c}_{iq} + \beta_3 \bar{a}_{iq} \bar{c}_{iq} + \beta_4 \bar{a}_{iq}^{(1)} + \beta_5 \bar{c}_{iq}^{(1)})
\]

\[
 h_2(Z_i) = \exp(\gamma Z_q)
\]

with \( \alpha_{iq} \sim N(\mu, \sigma^2) \), with EV level \( \bar{x}_{iq} \) and velocity \( \bar{a}_{iq}^{(1)} \) and with IV level \( \bar{c}_{iq} \) and velocity \( \bar{c}_{iq}^{(1)} \). The interaction between the EV and IV levels of commercial \( i \) at time \( q \) is indicated by \( \bar{a}_{iq} \bar{c}_{iq} \), the interaction between the velocities by \( \bar{a}_{iq}^{(1)} \bar{c}_{iq}^{(1)} \). \( Z_q \) denotes the \( j \)-th covariate for commercial \( i \). The distribution of the intercept represents heterogeneity in the mean probability to stop viewing a commercial across consumers and commercials. The form of the baseline hazard \( h_{ip}(t_q) \) in Equation 6.1 covers the most commonly used distributions for the hazard and minimizes the chance that the model is mis-specified (Ter Hofstede and Wedel 1998), since the estimates of the parameters are sensitive to the specification of the baseline hazard. For example, \( \alpha_1 = \alpha_2 = \alpha_3 = 0 \) corresponds to an
exponential distribution, $\alpha_1 = \alpha_2 = 0$ corresponds to a Weibull distribution and $\alpha_1 = 0$ corresponds to a Gompertz distribution.

The model is estimated by maximizing the simulated log-likelihood (SLL; Brownstone and Train 1999), in which the integral over the intercept distribution is approximated by a sum across ($R = 100$) draws from that distribution (Lee 1998). The SLL function is given by:

\[
\text{Equation 6.2: } \text{SLL} = \sum_{p=1}^{P} \sum_{i=1}^{I} \ln \left[ \frac{1}{R} \sum_{r=1}^{R} \left\{ h_{ip} \left( \alpha_{ipr} \right) \right\} \left( \prod_{q=1}^{Q} \exp\left( -h_{ipq} \left( \alpha_{ipr} \right) \right) \right) \right]
\]

whereas $\alpha_{ipr} (r = 1, \ldots, R)$ are random vectors drawn from the distribution of $\alpha_i$ and $\delta_{ip} = 1$ if consumer $p$ stops to view commercial $i$, and 0 otherwise. The estimates are obtained using standard gradient search procedures in GAUSS (Aptech 1992).

Summarizing, the first analysis stage provides for each commercial a composite EV/IV trace with a measure of EV/IV level and velocity in every second. The second analysis stage provides estimates of the separate and joint effects of these EV and IV levels and velocities on the consumer’s likelihood to discontinue viewing a particular commercial in each second of its duration.

### 6.6 Results

#### 6.6.1 Description of viewing behavior during TV commercials

To provide initial insights in the behavior of consumers during the commercials, some descriptive statistics are provided first in Table 6.2. In experiment 1, 25.4 to 71.6 % of the consumers stop viewing a particular commercial with an average of 59.6 % across commercials. In experiment 2, 37.8 to 97.5 % of the consumers stop viewing a particular commercial with an average of 76.1 %. Percentages are lower in experiment 1 presumably because of the commercial block design in experiment 1, and
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because in experiment 2 consumers are also exposed to more commercials.

Table 6.2: Percentages of consumers who stop watching a commercial

<table>
<thead>
<tr>
<th>Commercial</th>
<th>% consumers who stop watching</th>
<th>Commercial</th>
<th>% consumers who stop watching</th>
<th>Commercial</th>
<th>% consumers who stop watching</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>59.3</td>
<td>7</td>
<td>76.1</td>
<td>13</td>
<td>67.6</td>
</tr>
<tr>
<td>2</td>
<td>63.4</td>
<td>8</td>
<td>56.3</td>
<td>14</td>
<td>57.7</td>
</tr>
<tr>
<td>3</td>
<td>29.6</td>
<td>9</td>
<td>69.0</td>
<td>15</td>
<td>25.4</td>
</tr>
<tr>
<td>4</td>
<td>81.7</td>
<td>10</td>
<td>64.8</td>
<td>16</td>
<td>56.3</td>
</tr>
<tr>
<td>5</td>
<td>74.6</td>
<td>11</td>
<td>60.6</td>
<td>17</td>
<td>52.1</td>
</tr>
<tr>
<td>6</td>
<td>63.4</td>
<td>12</td>
<td>54.9</td>
<td>18</td>
<td>60.6</td>
</tr>
</tbody>
</table>

Experiment 2

<table>
<thead>
<tr>
<th>Commercial</th>
<th>% consumers who stop watching</th>
<th>Commercial</th>
<th>% consumers who stop watching</th>
<th>Commercial</th>
<th>% consumers who stop watching</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>70.6</td>
<td>10</td>
<td>62.2</td>
<td>19</td>
<td>78.2</td>
</tr>
<tr>
<td>2</td>
<td>67.2</td>
<td>11</td>
<td>97.5</td>
<td>20</td>
<td>73.1</td>
</tr>
<tr>
<td>3</td>
<td>69.7</td>
<td>12</td>
<td>64.7</td>
<td>21</td>
<td>75.6</td>
</tr>
<tr>
<td>4</td>
<td>92.4</td>
<td>13</td>
<td>75.6</td>
<td>22</td>
<td>71.4</td>
</tr>
<tr>
<td>5</td>
<td>73.1</td>
<td>14</td>
<td>77.3</td>
<td>23</td>
<td>78.2</td>
</tr>
<tr>
<td>6</td>
<td>37.8</td>
<td>15</td>
<td>47.9</td>
<td>24</td>
<td>72.3</td>
</tr>
<tr>
<td>7</td>
<td>84.0</td>
<td>16</td>
<td>45.4</td>
<td>25</td>
<td>95.0</td>
</tr>
<tr>
<td>8</td>
<td>73.9</td>
<td>17</td>
<td>91.6</td>
<td>26</td>
<td>37.8</td>
</tr>
<tr>
<td>9</td>
<td>43.7</td>
<td>18</td>
<td>81.5</td>
<td>27</td>
<td>84.9</td>
</tr>
</tbody>
</table>

Figure 6.2 for experiment 1 and Figure 6.3 for experiment 2 show the percentage of consumers that stopped viewing per second averaged across all, the first and last five commercials. These percentages are calculated by dividing the number of consumers who stopped on every second by the total number of consumers who have not yet stopped. Note that the number of consumers that continue viewing decreases over time. The average viewing time for the first five commercials is similar to (exp.2: significantly higher than) the average viewing time for later commercials (exp.1: 19 sec. in both cases, \( p < .77 \); exp.2: 18 versus 14 sec., \( p < .001 \)). The last five commercials are viewed shorter than earlier commercials (exp.1: 18 versus 19 sec., \( p < .12 \); exp.2: 13 versus 14 sec., \( p < .05 \)).
Moment-to-Moment Entertainment and Information Value

Because of the differences in the percentages of consumers to stop viewing across time and ad positions these control variables are taken into account in the model.

Figure 6.2: Percentages of consumers who stop watching a commercial, per commercial and per second for experiment 1

N.B. Note that scales on vertical axis differ.

% of consumers who stop watching per second averaged across commercials

% of consumers who stop watching per second averaged across 5 first commercials

% of consumers who stop watching per second averaged across 5 last commercials
Consumers’ Moment-to-Moment Processing of TV Commercials

Figure 6.3: Percentages of consumers that stop watching a commercial, per commercial and per second for experiment 2

N.B. Note that scales on vertical axis differ.

% of consumers who stop watching per second averaged across commercials

% of consumers who stop watching per second averaged across 5 first commercials

% of consumers who stop watching per second averaged across 5 last commercials

6.6.2 Representing MTM EV and IV
In the second experiment, one judge was removed from the EV/IV assessments because of outliers and nonresponse, leaving 19 judges for the analysis. Measures of the MTM EV and IV of the judges and the commercials demonstrated high reliability, with a median alpha equal to .96
Moment-to-Moment Entertainment and Information Value

(exp.1) and .94 (exp.2) for the MTM EV and .83 (exp.1) and .96 (exp.2) for MTM IV. The PCA accounted for 63% (exp.1) and 61% (exp.2) of the variance across judges for MTM EV and for 56% (exp.1) and 60% (exp.2) of the variance across judges for MTM IV. The obtained variance-accounted-for (VAF) values are satisfactory in both experiments. They are greater than the VAF criterion of 50% (Merenda 1997, p. 158) or 56.6% (Peterson 2000 p. 272), except for the composite IV trace in experiment 1, although 56% is still greater than 50% and very close to the VAF criterion of Peterson. As desired, the VAF values and positive signs of the weights indicate that judges agree sufficiently in assessing MTM EV and IV, and the size differences of the weights indicate that judges differ in quality of capturing the EV/IV traces of the commercials. Thus, the FDA approach enables us to obtain a single reliable representative MTM EV and IV trace for each commercial.

Figure 6.4 and Figure 6.5 present the resulting EV and IV traces for both experiments. These figures demonstrate that large variations are found in the EV and IV traces between commercials, and over time. Whether this affects the likelihood of discontinuing the viewing of a particular commercial at a particular point in time is examined next.

6.6.3 Performance of the random effects hazard model

Table 6.3 (see page 130) presents the estimates of the hazard model for both experiments. The pseudo $R^2$ of the model is .16 in experiment 1 and .11 in experiment 2. The hazard models in both experiments give identical signs of the parameters\(^{47}\), except for the ad placements variables\(^{48}\).

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\(^{47}\) In both experiments, the condition index of the explanatory variables is high (exp.1: 20.7; exp.2: 21.2) indicating that there may be some degree of multicollinearity (Judge et al. 1988). To explore this, we estimated the model with a single predictor at a time. Since similar estimates and significance levels as in Table 6.3 were obtained, it is unlikely that systematic bias of the results due to multicollinearity is present.

\(^{48}\) For the ad placement variable two dummies are computed: The first dummy denotes whether the commercial $i$ belongs to the first 5 commercials shown to consumer $j$ and the second dummy denotes whether this commercials belongs to the last 5 commercials shown to consumer $j$. A group of 5 commercials was chosen, because a number smaller than 5 did not give enough variability in the ad placement variables and/or MC problems in one or both.
Figure 6.4: The levels of entertainment and information value for each commercial in experiment 1
Moment-to-Moment Entertainment and Information Value

Figure 6.5: The levels of entertainment and information value for each commercial in experiment 2
The consistency of these findings is reassuring. Before examining the substantive results in detail, we first explore the control variables.

Table 6.3: Effects of entertainment and information value levels and velocities on the probability to stop watching a TV commercial

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Experiment 1</th>
<th>p-value</th>
<th>Experiment 2</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Baserate:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>-3.552</td>
<td>&lt;.001</td>
<td>-3.032</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Variance of constant</td>
<td>0.542</td>
<td>&lt; .01</td>
<td>0.594</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Time</td>
<td>-1.396</td>
<td>&lt; .001</td>
<td>-1.904</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Time * Time</td>
<td>1.577</td>
<td>&lt; .001</td>
<td>1.569</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Log of Time</td>
<td>0.964</td>
<td>&lt; .001</td>
<td>1.149</td>
<td>&lt;.001</td>
</tr>
<tr>
<td><strong>Covariates:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accumulated previous viewing time</td>
<td>-0.304</td>
<td>&lt;.001</td>
<td>-0.737</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Number of previous stops</td>
<td>0.659</td>
<td>&lt; .01</td>
<td>0.289</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Uniqueness of commercial</td>
<td>-0.218</td>
<td>&lt; .001</td>
<td>-0.099</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Familiarity of consumer with commercial</td>
<td>0.160</td>
<td>&lt;.001</td>
<td>0.259</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Dummy first 5 commercials</td>
<td>0.021</td>
<td>0.313</td>
<td>-0.612</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Dummy last 5 commercials</td>
<td>-0.038</td>
<td>0.298</td>
<td>0.299</td>
<td>&lt;.001</td>
</tr>
<tr>
<td><strong>Entertainment and Information Value:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Entertainment value level</td>
<td>-0.291</td>
<td>&lt;.001</td>
<td>-0.257</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Information value level</td>
<td>0.315</td>
<td>&lt; .01</td>
<td>0.761</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Entertainment * Information value level</td>
<td>0.433</td>
<td>&lt;.001</td>
<td>0.285</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Entertainment value velocity</td>
<td>-0.271</td>
<td>&lt; .001</td>
<td>-0.156</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Information value velocity</td>
<td>0.289</td>
<td>&lt; .001</td>
<td>0.169</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Entertainment * Information value velocity</td>
<td>0.074</td>
<td>&lt; .05</td>
<td>0.069</td>
<td>&lt;.01</td>
</tr>
<tr>
<td><strong>Fit measures:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AIC</td>
<td>57725</td>
<td></td>
<td>111426</td>
<td></td>
</tr>
<tr>
<td>BIC</td>
<td>116858</td>
<td></td>
<td>232630</td>
<td></td>
</tr>
<tr>
<td>SLL</td>
<td>-4154</td>
<td></td>
<td>-10130</td>
<td></td>
</tr>
<tr>
<td>Pseudo R²</td>
<td>16 %</td>
<td></td>
<td>11 %</td>
<td></td>
</tr>
</tbody>
</table>
6.6.4 Influence of the control variables
Several of the control variables have a significant effect on the probability to stop viewing a commercial\(^{49}\). The longer the consumer watched previous commercials (exp.1: -0.304, \(p < .001\); exp.2: -0.737, \(p < .001\)) and the higher the level of uniqueness of the current commercial (exp.1: -0.218, \(p < .001\); exp.2: -0.099, \(p < .01\)), the lower the likelihood to stop viewing the commercial. Also, the more frequently a consumer stopped watching previous commercials (exp.1: 0.659, \(p < .001\); exp.2: 0.289, \(p < .001\)) and the more familiar the current commercial is (exp.1: 0.160, \(p < .001\); exp.2: 0.259, \(p < .001\)), the higher the probability is to stop watching the commercial. These findings are intuitive, and they show that it is important to control for differences between consumers (previous viewing time, previous frequency of stopping, and ad familiarity) and commercials (uniqueness). Ad placement does not affect the probability to stop watching a TV commercial in the first experiment, as shown by the insignificant dummy variable effects for the first 5 commercials (0.021, \(p < 0.32\)) and for the last 5 commercials (-0.038, \(p < 0.30\)). In the second experiment the first (last) five commercials (-0.612, \(p < .001\); 0.299, \(p < .001\)) have a lower (higher) probability to be stopped presumably due to saturation effects. The different effect of the ad placement variables in the two experiments may be due to the commercial-block design in the first experiment and the fact that more commercials are used in the second experiment.

6.6.5 Baseline hazard to stop viewing
In both experiments, all three terms in the baseline hazard are significant \((p < 0.001\) in all cases): The larger the duration of a commercial, the higher the likelihood to stop viewing a commercial, independent of other variables.

\(^{49}\) Several exploratory analyses investigating the effects of some demographic variables, such as gender, age and education, yielded insignificant effects in both experiments. This is in line with previous studies that found very little variance explained by demographic variables in explaining consumers’ viewing behavior during TV commercial breaks using people meter data (Danaher 1995; Van Meurs 1998b, 1999). Therefore we have not included demographic variables in the final model.
Figure 6.6: Baseline probability to stop watching a 30-second commercial in both experiments

The standard deviation of the random intercept is significant (exp.1: 0.542, \( p < .01 \); exp.2: 0.549, \( p < .001 \)). This shows that there is significant variation in the baseline hazard across commercials and consumers, which is in line with Siddarth and Chattopadhyay (1998). To illustrate the findings, Figure 6.6 provides the estimated baseline hazard for a 30-second commercial in both experiments. Over time the baseline hazard of stopping a commercial is higher in the second than in the first experiment. This may be due to the larger number of commercials and the absence of surrounding TV programming in the second experiment. Figure 6.6 shows that the baseline hazard increases much in the first and last part.
of the commercials, and remains relatively stable in the middle part. The first and last periods appear the crucial ones to retain consumers. Next we tested our six hypotheses, while statistically controlling for these baseline hazard effects and for the influence of potential individual and commercial differences.

6.6.6 Influence of EV and IV level

Hypotheses 1 to 3 all receive strong support. As predicted in hypothesis 1, high positive EV levels decrease the probability to stop viewing a TV commercial in both experiments (exp.1: -0.291, $p < .001$; exp.2: -0.257, $p < .001$). In support of hypothesis 2, high positive levels of IV increase the probability to stop viewing a commercial in both experiments (exp.1: 0.315, $p < .001$; exp.2: 0.761, $p < .001$). Finally, there is a systematic interactive effect of EV and IV levels on the likelihood to stop viewing in both experiments, which supports hypothesis 3. The significant, positive interaction effect for the MTM levels in both experiments (exp.1: 0.433, $p < .001$; exp.2: 0.285, $p < .001$) demonstrates that higher mean levels of both EV and IV increase the probability to stop viewing. To explore this interaction between EV and IV levels in more detail, Figure 6.7 and Figure 6.8 present each a 3-dimensional plot with EV and IV levels on the $x$ and $y$ axis, keeping other effects constant. The estimated probability to stop is on the $z$ axis, for $t = 15$ seconds, which is the median time point across commercials. To provide further details, for each experiment two additional plots are presented to show how EV, respectively IV influences the probability to stop viewing, when IV, respectively EV level is kept either low or high. In both experiments, the probability to stop viewing a TV commercial is the highest when the MTM EV and IV levels are both high. Also, the probability to stop viewing is lowest when EV is high and the IV level is at the same time low (this is particularly clear in experiment 2).

The results of the two experiments provide strong and converging support that high levels of MTM EV and IV conflict. They also demonstrate systematically that when aiming to retain consumers until the end of a commercial, high levels of EV, but low levels of IV, are called for.
Figure 6.7: Illustration of the interaction of entertainment value (EV) and information value (IV) levels on the probability to stop watching a commercial at 15 seconds with corresponding projections in experiment 1.

Interaction of entertainment and information value level on probability to stop.

Influence of entertainment value level on probability to stop if information value level is low, respectively high

- Dotted line = Probability to stop if IV is low
- Solid line = Probability to stop if IV is high

Influence of information value level on probability to stop if entertainment value level is low, respectively high

- Dotted line = Probability to stop if EV is low
- Solid line = Probability to stop if EV is high

*N.B. Note that scales on vertical axis differ.*
Moment-to-Moment Entertainment and Information Value

Figure 6.8: Illustration of the interaction of entertainment value (EV) and information value (IV) levels on the probability to stop watching a commercial at 15 seconds with corresponding projections in experiment 2

- Information value on x-axis
- Entertainment value on y-axis
- Probability to stop on z-axis

Interaction of entertainment and information value level on probability to stop.

Influence of entertainment value level on probability to stop if information value level is low, respectively high

\[ \text{P.Stop} \]

\[
\begin{array}{c c c}
\text{Low} & \text{High} \\
\text{Entertainment value} & \text{Information value}
\end{array}
\]

\[ = \text{Probability to stop if IV is low} \]
\[ = \text{Probability to stop if IV is high} \]

Influence of information value level on probability to stop if entertainment value level is low, respectively high

\[ \text{P.Stop} \]

\[
\begin{array}{c c c}
\text{Low} & \text{High} \\
\text{Information value} & \text{Entertainment value}
\end{array}
\]

\[ = \text{Probability to stop if EV is low} \]
\[ = \text{Probability to stop if EV is high} \]

N.B. Note that scales on vertical axis differ.
6.6.7 Influence of EV and IV velocity

Hypotheses 4 to 6 are also corroborated. In support of hypotheses 4 and 5, the MTM EV velocity (exp.1: -0.271, \( p < .001 \); exp.2: -0.156, \( p < .001 \)) decreases and IV velocity (exp.1: 0.289, \( p < .001 \); exp.2: 0.169, \( p < .001 \)) increases the probability to stop watching a commercial. In support of hypothesis 6, the interaction term of the velocities in both experiments is positive and significant (exp.1: 0.074, \( p < .05 \); exp.2: 0.069, \( p < .01 \)). High positive EV velocities in combination with high positive IV velocities increase the probability to stop watching a commercial.

6.6.8 Comparison to benchmark models

To examine the performance of our analytical approach over alternative ones, we compared it to two simpler, benchmark models. In the first benchmark model the smoothed EV and IV levels and velocities were averaged over time within each commercial and were thus assumed to be constant during commercial exposure. The model still contained velocities, interaction terms and heterogeneity. This benchmark model mimics the previous research that has relied on post-exposure summary measures rather than moment-to-moment measures of ad contents. In the second benchmark model the raw scores, averaged across judges, were also averaged across time within each commercial to obtain a post-exposure summary measure of the EV and IV level of each commercial. In addition, no velocities, no heterogeneity nor interaction terms were included in the second benchmark model, following previous research. All other covariates were kept the same. This benchmark model mimics previous studies that have not employed FDA and used the raw scores as simple post-exposure measures of ad contents.

Overall, our model outperforms the first benchmark model: exp.1: \( AIC: 57725 \) vs. \( 58299 \); \( BIC: 116858 \) vs. \( 117431 \); exp.2: \( AIC: 111426 \) vs. \( 112311 \); \( BIC: 232630 \) vs. \( 233515 \). Moreover, the first benchmark model yields a counterintuitive sign for the effects of the EV level (0.331, \( p < .05 \)), IV level (-0.061, \( p < .18 \)) and the interaction term between the velocities (-0.152, \( p < .05 \)) in the first experiment and for the EV velocity (0.221, \( p < .001 \)) in the
second experiment. This comparison indicates that using MTM ad contents measures are necessary to adequately describe the consumer’s likelihood to discontinue to view a commercial.

Our model also outperforms the second benchmark model: exp.1: \( \text{AIC}: 57725 \) vs. \( 58448; \) \( \text{BIC}: 116858 \) vs. \( 117593; \) exp.2: \( \text{AIC}: 111426 \) vs. \( 112354; \) \( \text{BIC}: 232630 \) vs. \( 233571. \) The final benchmark model also gives a wrong sign for the IV level (\(-0.120, p < .01\)) and the velocity interaction term (\(-0.194, p < .001\)) in the first experiment and for the EV (\(1.302, p < .001\)) and IV level (\(-0.708, p < .01\)) in the second experiment. This comparison indicates that using FDA to obtain MTM ad contents measures improves the accuracy of the description of the consumer’s probability to stop viewing a commercial.

These comparisons demonstrate that the application of the FDA approach with moment-to-moment measurements of levels, velocities and their interactions is superior in describing consumers’ viewing behavior during a particular commercial. More importantly, our model provides details about ad characteristics at the exact moments that consumers exercise control over their exposure to commercials, and it enables a close analysis of the influence of EV and IV level and velocity on viewing behavior.

### 6.7 Discussion and concluding remarks

This research has shown how the moment-to-moment entertainment value and information value of television commercials affect consumers’ decisions to continue or discontinue watching them. First we show that with functional data analysis, a moment-to-moment entertainment value and information value trace can be tapped efficiently for each commercial. Using a large number of consumers and commercials, the two experiments provided converging evidence for the influence of entertainment value and information value on consumers’ decisions to stop viewing a TV commercial. A high entertainment value ensures that consumers continue viewing the commercial, while a high information value induces consumers to stop viewing. The positive velocity effect of entertainment value indicates that beyond the effect of its level as such, positive deviations of entertainment value further retain consumers. Not only do we find that a
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High information value makes consumers turn away from commercials, but also that increases in the information value (velocity) have an additional negative effect. Thus, accelerating information rates accelerate decisions to stop. Our results demonstrate that, as we argued, entertainment value and information value are indeed incompatible at higher levels and positive velocities. That is, consumers oppose high levels of both, and prefer a high level of entertainment value with a low level of information value, to high levels in both.

Several topics for discussion remain. Of course, the laboratory character of the present research limits the generalizability of its findings. To increase the internal validity, we selected a laboratory design for our experiments, which provides a strong test of the hypotheses, controlling for many confounding variables. The strong support for the predictions in both experiments, using different and comparatively large samples of commercials and consumers is reassuring, but only follow-up research under natural circumstances can determine to what extent our findings hold in practice.

Furthermore, note that our definition of stopping to view a TV commercial agrees mostly with “skipping” using the 30-second “Quick-Skip” button of a PVR, and less so with typical zapping or zipping situations at home or using the “Auto skip” button to jump over entire commercial pods, although there is some overlap (see Section 1.2). When consumers at home skip commercials using the “Quick skip” button, as in the current study, they may see a little bit of each commercial that influences their likelihood to continue or discontinue viewing and hence to skip or not to skip to the next commercial or program. The percentages of consumers who stopped viewing a commercial in our research 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), probably because our participants were exposed to more commercials in a particular time period, and were always exposed to the next commercial after a “skip”. The percentages of consumers who stopped viewing in the two experiments are more in line with the findings of a recent study by CNW Marketing Research (Friedman 2002) indicating that 72.3 % of PVR owners skip commercials, a figure close to our results.
In both experiments we controlled for the effects of ad familiarity. In the first experiment we did not collect ad familiarity from the same consumers whose viewing behavior was recorded, but used an independent sample of judges to assess it. In the second experiment we collected ad familiarity from the same consumers. Although it is preferable to collect ad familiarity from the same consumers, the convergence of the findings of the two experiments, with different operationalizations of ad familiarity lends credence to our results.

When assessing moment-to-moment information value, judges evaluated commercials on the presence of several information items. Because, in both experiments, judges agreed sufficiently in their moment-to-moment assessments, and since these measures predicted the decisions of consumers to stop viewing significantly, and in the predicted direction, we believe that judges are well able to track moment-to-moment information values of commercials. The same holds for moment-to-moment entertainment value. Thus, while it may sometimes be desirable to assess moment-to-moment entertainment and information value, as well as decisions to stop viewing commercials using a single sample of consumers, the present research demonstrates the insight and level of detail that can be obtained using multiple samples for multiple measures.

The findings suggest several avenues for future research. Previous studies have shown that programming material around commercials may influence ad recall (Lloyd and Clancy 1991; Tavassoli, Schultz, and Fitzsimons 1995) and audience size during the TV program (Danaher and Lawrie 1998). If a viewer’s attitude toward different television programs carries over into the embedded commercials, this may systematically affect ad response and performance and thus also the consumer’s likelihood to discontinue viewing of a commercial. In the first experiment, TV programming material was used. By using different random orders of commercials and TV programming, the effect of viewers’ attitude to these programs is compensated for. We did not include TV program material in the second experiment, instead using a larger number of commercials. The convergence of findings across the two experiments indicates that potential

Our ad familiarity questions could have been improved by including a time period and more detailed scales.
moderating effects of programming context on the effects of entertainment and information value of commercials were not large and systematic in the present research. But, interestingly the baseline probabilities to stop viewing in the experiment without program material were considerably larger. And we found that, in the study with surrounding program material, the effect of information on decisions to stop viewing commercials was much smaller. In addition, the current research showed that the frequency of stopping previous commercials increased the likelihood of stopping the current commercial, which would favor shorter over longer commercial breaks to maximize exposure. Future research may examine more systematically the influence that television program context versus the preceding commercials in the commercial break have on stopping to view specific commercials during the breaks. Perhaps, program-commercial compatibility is important, in which case the likelihood of stopping commercials with high information value increases even further when they are in the breaks of entertainment rather than informative programs. Of course, such compatibility effects may be only short-lived, in which it would only concern earlier commercials in the breaks, which the current methodology can detect. Moreover, previous commercials in the break may affect the likelihood to stop viewing a specific commercial more than program context does, which our methodology may also determine.

We did not examine the mediating processes between the entertainment and information traces of television commercials and their probability to be stopped. Our study shares 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 specific recommendations that can be derived from our results partly depend on the mediating processes that drive the obtained findings. If, for instance, reduced motivation and/or ability accounts for the observed effects (e.g. MacKie and Worth 1991), raising motivation and/or ability by including other material in the commercial, media context or consumer task might ameliorate the motivation to stop viewing. If, on the other hand, incongruity of processing styles is accountable (e.g., Bless 2000; Fiedler 2000), the entertainment-information value conflict is more
intrinsic and perhaps more difficult to cope with when advertisers’ aim to retain viewers as long as possible.

While these considerations are important, we believe that they do not detract from the relevance of the conclusions from the two current experiments. They first show the incompatibility of entertainment and information value at high levels and velocities, which has been proposed recently in decision making and emotion theory, but to our knowledge, not shown before empirically. Our study calls for more research in which the role of the proposed mediation processes is further examined. One approach in future research might be to systematically vary task, situation and consumer characteristics and examine their effect on the type of processing styles and more down-stream effects such as zapping, zipping and skipping. Another approach would be to assess, concurrently with moment-to-moment entertainment and information value, the moment-to-moment processing demand on consumers, i.e., the ease or difficulty of processing the material, or perceptual process measures such as eye movements. In addition, beyond the two dimensions of entertainment and information value, advertisers may desire more detailed moment-to-moment information to help the design of commercials. Moment-to-moment entertainment and information value are rather abstract dimensions of ad contents, and the findings from this chapter do not provide advertisers insights into how specific, more controllable, ad dimensions influence consumers’ viewing behavior during commercial exposure. In addition, this chapter assumes that if entertainment value and/or information value is present at a particular commercial moment, consumers pay full attention to it. In print advertising research using eye movements, it is found that this is not always the case and consumers’ attention to specific ad elements (e.g., brand element, text, pictorial) depends on the lay-out and size of the ad features in the advertisement (Pieters et al. 1999; Pieters and Wedel 2003; Wedel and Pieters 2000). As discussed in Section 4.5.6, eye tracking is a reliable instrument to measure consumers “real” attention to ad elements. For these reasons the next chapter uses eye movements to investigate how consumers’ moment-to-moment “real” attention to a managerial controllable key ad feature in TV commercial, namely the brand element, influences consumers’ decisions to discontinue to view during commercial exposure.
Consumers' Moment-to-Moment Processing of TV Commercials