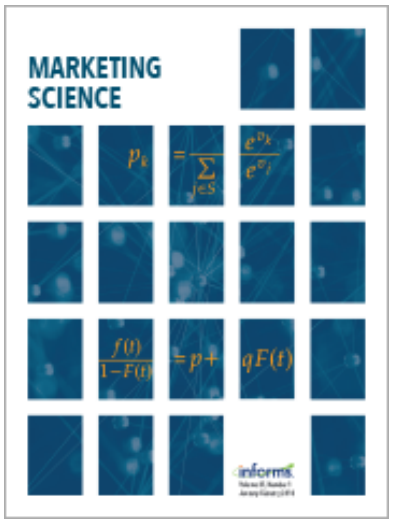

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Ad Gist: Ad Communication in a Single Eye Fixation

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Most ads in practice receive no more than a single eye fixation. This study investigates the limits of what ads can communicate under such adverse exposure conditions. We find that consumers already know at maximum levels of accuracy and with high degree of certainty whether something is an ad or is editorial material after an exposure of less than 100 milliseconds and—if the ad is typical—which product is being advertised. Even after an extremely coarse visual presentation of 100 milliseconds, the product and brand in typical ads are identified well above chance levels, with atypical ads doing slightly better at the brand level. We propose a new metric that quantifies how effectively individual ads communicate their gist in adverse exposure conditions and that predicts the immediate interest that ads draw. Bayesian mediation analyses show that because of their better gist performance, typical ads rather than atypical ones raise immediate interest after very brief exposures. These findings challenge some of the received knowledge in advertising theory and practice, and they reveal the immediate communication benefits of typical ads.

Key words: advertising; gist; clutter; typicality; eye fixation; Bayesian models; mixed-outcome models
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1. Introduction

Consumers have opportunities to see several thousand ads a day, according to some guesstimates.[1] These ads appear in magazines, newspapers, catalogs, the Yellow Pages, supermarkets, movies, and video games and on billboards, trucks, TV, TIVO, and websites. Most of these ads receive at best only a brief look. As a case in point, a study by the Poynter Institute recently found that banner ads on websites were looked at for less than one second (Outing and Ruel 2004). In fact, ads placed in top and right locations were looked at barely longer than the duration of a single fixation of the eye. An eye fixation is the brief period of up to 300 milliseconds during which the eye is still and information is extracted from the stimulus (Wedel and Pieters 2000). Many banner ads did not even get this "briefest of looks," although the eyes fixated closely enough that the ads could be seen in peripheral vision.[2] Similarly, many ads in magazines and newspapers receive at most a single eye fixation (Zhang et al. 2009). Not only are exposures to the majority of ads very short, but the impressions that are obtained from them are often coarse because exposures occur in the visual periphery, which severely limits the detail that can be perceived (Janiszewski 1998).

The main questions that our research addresses are which meaning, if any, ads can communicate under these adverse exposure conditions and how unfavorable the conditions can be before ads stop communicating. Answering these questions has managerial and theoretical implications for how to study the ability of ads to convey their meaning fast, which is valuable for ad development and pretesting. Furthermore, the insights from our research can contribute to optimizing media planning and selection, in particular, for ads in cluttered media such as newspapers, magazines, the Web, and out-of-home media, for which it is crucial to know the value of the very brief looks that most ads receive from consumers (Danaher et al. 2010). Understanding what meaning ads communicate during a single eye fixation also contributes to advertising theory. A great deal is known about the communication effects of the few ads that receive long and forced exposures of up to 20 seconds, in which much visual detail is available (Goldenberg et al. 1999,

[1] American Association of Advertising Agencies. How many advertisements is a person exposed to in a day? http:// www.aaaa.org/eweb/upload/faqs/adexposures.pdf (accessed March 2011).

[2] See Outing and Ruel (2004).

Meyers-Levy and Malaviya 1999). Those insights are important, and our study is not intended to refute them, but they may not apply to the majority of ads. What is needed is a better understanding of the immediate communication that can take place during the brief and coarse exposure conditions that are common in practice. The present research aims to contribute to this understanding.

To address our research questions, we build on recent developments in the object and scene perception literatures (Grill-Spector and Kanwisher 2005, Oliva 2005). These developments fit in a larger movement toward understanding the influence that "thin slices" of information have on judgment and decision making (Ambady and Rosenthal 1993, Peracchio and Luna 2006). To examine the limits of what ads can communicate during a single eye fixation, we systematically vary the exposure duration (from very short to short) and the amount of visual detail in the ads (from normal to very coarse). We identify ad typicality as a key characteristic of creative strategy (Goldenberg et al. 1999, Goodstein 1993) that determines what ads can communicate in a single eye fixation and whether they generate interest immediately. Interest is an immediate, affective response to advertising that facilitates subsequent processing (Mandler 1982, Silvia 2008, Yang and Smith 2009). We will investigate whether typical or atypical ads generate more immediate interest and whether this is related to how well people can grasp the ad's gist in a single eye fixation. Our study thus aims to provide insights into the comprehension processes that take place during very brief ad exposures and into the determinants and an instant communication effect of these processes.

The structure of the rest of this paper is as follows. The next section describes the prior research on which we build and lays down the predictions. Then data are reported from a series of controlled studies using magazine ads. The studies investigate the effects of exposure duration and coarseness of the ad image on gist perception. Based on the results of the final study, we propose a metric to assess the ability of ads to communicate their gist in a single eye fixation (Ad Gist). The predictive validity of the Ad Gist metric for the immediate interest that ads generate is assessed. The final section discusses implications, limitations, and directions for future research.

2. The Gist of Advertising

Gist is the essential meaning of a scene in terms of the categories it belongs to (Oliva 2005). That is, a scene may depict a kitchen or office, street or beach; an ad may be for cars or coffee. Gist perception is thus an early categorization process that helps people to quickly navigate in cluttered environments. It helps to rapidly decide which of the numerous scenes in the consumers' environment are interesting and merit more attention, which to ignore, and which specific locations in the scene to inspect more closely (Bar 2004). Gist perception provides people with coarse snapshots of the surrounding world for rapid decision making, and these snapshots have been shown to affect downstream measures such as preferences (Ambady and Rosenthal 1993).

Gist perception can take place at various levels of specificity. We propose that in the context of advertising, the ad, product, and brand levels, respectively, are essential. At the first, generic level, an image that consumers are exposed to can be identified as an advertisement or as surrounding material such as an editorial article in a magazine. At the second, intermediate level, an image can be an ad for a particular product category, such as for cars, financial services, food, or skincare products. At the third, most specific level, the image can be an ad for a particular brand in the product category, such as BMW or Lexus. These three levels reflect the specificity of gist perception, from superordinate ("Ad or not?"), to basic ("Which advertised product?"), to supraordinate ("Which branded advertised product?") (Meyers-Levy and Tybout 1989, Rosch et al. 1976).

Gist perception is a process of advertising comprehension that takes place rapidly and automatically. Knowing that an image is an ad for a particular product and brand provides information that helps to understand the ad. Consumer behavior theory has distinguished between early "categorization" stages and later "message understanding" stages in advertising comprehension (Hoyer and MacInnis 2001). Advertising research has investigated the later stages of message understanding that take place, for example, in verbal claims in ads, after longer exposures (Jacoby and Hoyer 1989, Mick 1992). Such research has also examined how ads that deviate from the schemes that consumers have about ads influence message understanding after longer exposures (Meyers-Levy and Tybout 1989, Ratneshwar and Chaiken 1991). We are not aware of research on the early process of gist perception of ads after very short exposures that are common in practice.

2.1. Gist Perception in a Single Eye Fixation

Consumers who have sufficient time to explore ads, websites, store shelves, and similar scenes make sequences of eye movements, in which the eyes fixate on a certain location of the scene for an average of 250 to 300 milliseconds and then make quick saccades to the next fixation location until done. Visual information is extracted during eye fixations, and vision is suppressed during eye saccades. Gist perception is believed to mostly take place during the

first eye fixation on a scene, which thus has a special status (Biederman 1981, Oliva 2005, Rayner and Castelhano 2007).

An eye fixation proceeds in two stages. In the first stage, information extracted from the scene rapidly accumulates. This stage is estimated to last up to about 100 milliseconds after the start of a fixation (Harris et al. 1988). Research in cognitive psychology has found, for instance, that the accuracy of categorizing typical objects, such as chairs and cars, and typical scenes, such as beach, kitchen, and forest scenes, increases steeply between exposure durations of 20 and 100 milliseconds (Greene and Oliva 2009, Grill-Spector and Kanwisher 2005, Loftus and Harley 2004). In the second stage of an eye fixation, after about 100 milliseconds, the rate of information accumulation diminishes, and a saccade to the next fixation location is being planned (Rayner and Castelhano 2007). The information extracted in this second stage mostly reduces the uncertainty of the initial categorization, which is reflected in faster response times in categorization tasks (Koriat 2008, Lamberts 2000).

It appears that people can indicate with around 90% accuracy whether images presented for time periods less than a single eye fixation contain a simple forest, street, office, or beach scene (Rousselet et al. 2005). Such results have led to the generally accepted idea that "observers recognize a real-world scene at a single glance" (Oliva 2005, p. 251) and that a single eye fixation is "all that is required to comprehend most scenes" (Biederman 1981, p. 216). If this conclusion holds for ads, about 100 milliseconds would suffice to grasp the gist of most ads. We will qualify this prediction later.

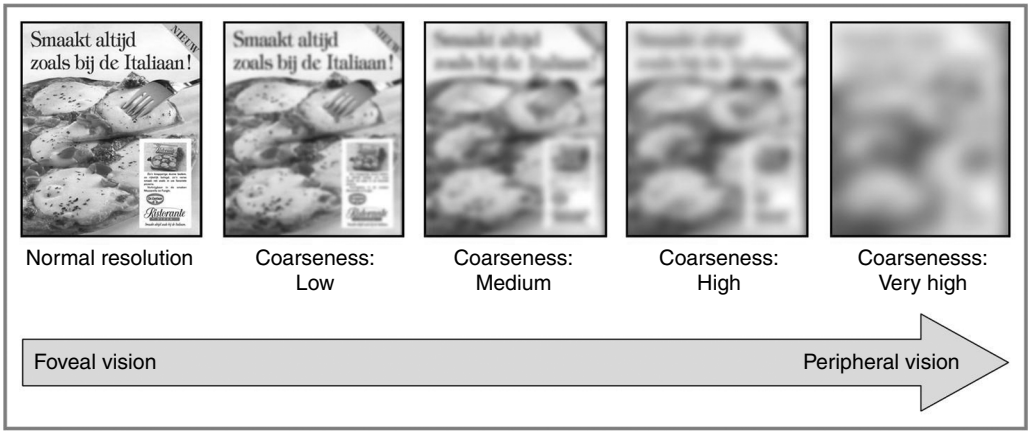
During an eye fixation, detailed visual information can be extracted only from a small area of about 2° of visual angle around the fixation point (Janiszewski 1998, Rayner and Castelhano 2007). This is no bigger than the size of a thumbnail at arm's length. Beyond this small area of foveal vision, the degree of detail that can be extracted from the scene rapidly deteriorates toward the visual periphery (Loschky et al. 2005). Figure 1 illustrates for one of the ads in our studies the increasing coarseness of visual information, similar to the degradation of available information when moving to the visual periphery (the ad is for frozen pizza by Dr. Oetker).

There is evidence that gist perception relies on such coarse visual information that contains global properties of scenes, such as whether it is natural or man-made (Greene and Oliva 2009, Oliva 2005), and on the presence of diagnostic objects, such as a cow in a farm scene (Bar 2004, Biederman 1981). Thus, visual detail is not needed for gist perception, but it is unknown how much visual detail can be removed from a scene before it stops communicating its gist. Ads are usually more complex than the typical stimuli that have been used in basic research on gist. Ads normally contain a variety of partly overlapping colored pictorials and text blocks, and the attention load that such complexity poses may hamper fast and accurate gist perception. The important question is, then, if coarse visual information in ads also supports their gist perception. In addition, the question that has not yet been addressed is how the typicality of the ad affects gist perception.

2.2. Ad Typicality Effects on Gist Perception

Consumers have acquired memory representations of the typical ads that they encounter. A memory representation or schema of a *typical ad* might contain a headline at the top, a large pictorial in the center, the body text at the bottom, and the brand logo in the lower right corner. A memory representation of a *typical car ad* might in addition include a car in an outdoor scene with a road, mountains, and the sun. Whereas a specific car ad may also contain houses and animals,

Figure 1 Visual Coarseness: Decreasing Detail from Eye Fixation Point to the Periphery



the memory representation of a typical car ad may not include these. Advertisers and agencies develop atypical ads to be creative and stand out from the hosts of other ads and from the editorial material that surrounds the ads (Goldenberg et al. 1999, Pieters et al. 2002, Yang and Smith 2009). Atypical ads differ from the memory representations that consumers have of ads in a particular product category, such as when a car ad depicts an indoor scene without a car.

Information about the gist of ads rapidly accumulates during exposure from the very first moment (Bacon-Macé et al. 2005, Greene and Oliva 2009). Theories of perceptual decision making, supported by neurological evidence, postulate that the information extracted from a stimulus accumulates stochastically until it crosses a decision threshold (Heekeren et al. 2008, Smith and Ratcliff 2009). The more information is available in the stimulus, the faster it accumulates and becomes available for decision making. Removing detailed information from the stimulus, as is the case for coarse images, will thus result in slower information accumulation and less accurate categorization. Stronger prior memory representations of the stimulus will lower the decision threshold and lead to more accurate and faster categorization. Thus, this threshold should be lower for typical than for atypical ads, and the gist of typical compared with atypical ads should thus be perceived more accurately and faster.

We therefore predict that in less than a single eye fixation, the gist of typical ads in terms of the ad and product is perceived highly accurately and much better than the gist of atypical ads. Furthermore, because the decision threshold needs to be higher for more specific categorizations (Heekeren et al. 2008), we also predict that accuracy of gist perception at the brand level is lower than it is at the product level, both for typical and atypical ads. These predictions are consistent with findings that objects shown for fewer than 100 milliseconds in their (typical) upright position are highly accurately categorized at the basic level but not at the supraordinate level (Grill-Spector and Kanwisher 2005), whereas showing these same objects in an (atypical) inverted position leads to sharp reductions in categorization accuracy at the basic level as well (Mack et al. 2008). Although these findings pertain to object perception and to atypical spatial position only, we expect to find similar effects for the gist perception of typical and atypical ads at the product (basic) and brand (supraordinate) levels.

We also predict that under increasing degrees of visual coarseness, accuracy of gist perception deteriorates less for typical than for atypical ads. This is consistent with the finding that increasing image degradation has little effect on accurate perception of typical scenes (Greene and Oliva 2009). Because of the strong memory representations of typical ads, gist perception can rely on global scene properties and even on coarse "blobs" of visual information (Oliva and Schyns 1997). However, because of the weak memory representations of atypical ads, gist perception needs to rely on visual details in the ad. Therefore accuracy in perception should suffer more with increasing visual coarseness.

Support for these predictions would reveal that the accepted conclusion that "observers recognize a real-world scene at a single glance" (Oliva 2005, p. 251) and that a glance is "all that is required to comprehend most scenes" (Biederman 1981, p. 216) generalizes to typical but not to atypical ads, and it holds more for gist perception at the ad and product levels than at the brand level. It is an empirical question of how brief and how coarse the exposure conditions to typical and atypical ads can be before they stop communicating these meanings. In our experiments, we will systematically vary exposure durations and degrees of coarseness of the visual image of ads to establish the limits of ad gist perception.

2.3. Immediate Interestingness of Ads

After short exposures, information about the gist of an ad is limited and uncertainty about what it is for is high. People generally dislike such uncertainty and desire a sufficient level of comprehension, structure, or "perceived control" (Kunda and Spencer 2003, Skinner 1996), in particular after short exposure durations (Noorderwier and Stapel 2010). People monitor the accumulation of information during exposure to an ad, and they experience a "feeling of knowing" as more information becomes available and as it becomes available faster (Koriat 2008). Thus, we expect that after brief exposures, the feeling of knowing the gist of ads should be appraised positively. Typical ads are consistent with ad schemas and are thus predictable (Mandler 1982). They communicate their gist better and faster and feel familiar (Winkielman et al. 2006). This generates an immediate, momentary feeling that they are interesting. On the contrary, atypical ads deviate from typical memory representations of ads, which is unexpected for the viewer, and these ads do not invoke such interest.

Interest has been called "the curious emotion" that motivates people to explore and learn (Silvia 2008) and that facilitates subsequent processing (Mandler 1982, Yang and Smith 2009), and as such, it is an early indicator of ad effectiveness. Interest is an initial stage in hierarchy-of-effects theories of advertising (Hoyer and MacInnis 2001) and has been shown to raise intentions to view on subsequent opportunities to see (Yang and Smith 2009). We therefore examine the effect that ad typicality and gist perception has on a measure of immediate interest. We predict that after a single eye fixation, typical ads generate more

immediate interest than atypical ads do and that this positive effect of ad typicality on interest is mediated by their gist performance.

3. Overview of the Studies

In sum, we examine the levels at which the gist of typical and atypical ads can be accurately perceived after a single eye fixation and the effect of gist perception on the immediate interest that ads generate. Study 1 investigates the influence of varying exposure durations from 20 to 180 milliseconds on accuracy and response time of gist perception for typical and atypical ads at the ad and product levels. Study 2 investigates the gist perception of typical and atypical ads at the product and brand levels. It also further investigates the limits of gist perception by varying the amount of visual information in the ads from normal to extremely coarse. Based on this, we propose an Ad Gist metric that captures the depth at which individual ads can convey their gist under the adverse exposure conditions that are common in practice. We illustrate its application for the ads in our studies. Study 3 investigates differences between typical and atypical ads in generating immediate interest and how this relates to their Ad Gist performance.

4. Stimulus Development

A pilot study and three pretests were conducted to select the ads for the main studies. In 2007, the spending of the 100 leading advertisers in the United States on magazine advertising was second only to spending on TV advertising, with major spending in the categories of food, cars, financial services, and beauty and health,[3] so these four categories were selected. They represent durable and nondurable goods and services. The pilot study aimed to discover the memory representations that consumers have of typical ads in these four product categories and to guide the selection of the ads for the main studies.

4.1. Pilot Study

Inspired by Bartlett's (1932) memory production task, we asked 80 (50 males, 30 females) paid undergraduate student participants to draw a typical ad for a particular product (cars, financial services, food, or skincare). Each participant drew one "typical advertisement" for a product on a sheet of paper (A4 size). The 80 drawings of ads were coded for presence (yes–no), size (in millimeters squared), and content of the pictorial (yes–no presence of product, consumer, salesperson, specific locations, and/or general consumption context, respectively; multiple codes possible); presence (yes–no) and size (in millimeters squared) of the brand; presence of price or other financial information (yes–no); presence of headline (large-font text often at the top; yes–no); and total number of words.

A four-group multiple discriminant analysis (MDA) showed that 76.3% of the product ads could be correctly classified based on this content information only ($\chi^2(1) = 84.05$, $p < 0.001$). That is, drawings of financial ads predictably did not contain pictorials of the target product (0%; although one ad showed rolling coins as a metaphor for spending money), but food (75%), car (70%), and skincare (65%; $F(3, 76) = 15.10$, $p < 0.001$) ads did. Most drawings of skincare ads showed the consumer (70%; female body parts and facial close-ups) more so than financial ads (30%), food ads (15%), or car ads did (0%; $F(3, 76) = 12.58$, $p < 0.001$). Salespersons appeared in financial ads (25%, all male) but in none of the other ads (0%; $F(3, 76) = 6.33$, $p < 0.01$). Monetary information such as price more often appeared in financial ads (50%) than in car ads (25%), food ads (5%), and skincare ads (5%; $F(3, 76) = 6.51$, $p < 0.01$). Whereas these results point to the presence of a central diagnostic object in typical ads, the layout of the ad scene is diagnostic as well: outdoor scenes were more often present in car ads (50%) than in financial ads (25%), food ads (15%), and skincare ads (10%; $F(3, 76) = 3.67$, $p < 0.05$). None of the other variables differed significantly between ad categories. These results show the remarkable detail of people's memory representations of ads, which reflect specific product categories rather than ads in general.

Based on these results, we selected 32 ads (8 per product) from various recent issues of general consumer magazines. Two trained experts judged the ads on their typicality for the product category, which led to a few changes in the ad sample. Typical and atypical ads differed in the objects and scenes depicted. That is, typical but not atypical car ads contained a large pictorial of a car and outdoor scene. Typical but not atypical skincare ads showed a face or body parts in close-up. Typical but not atypical financial ads had a service provider, consumers in financially safe situations, and/or much text. Typical but not atypical food ads contained pictorials with large packshots of the food. In addition, we selected eight regular editorial pages from magazines to provide a natural context and benchmark in the studies.

4.2. Pretesting

Three separate pretests were conducted. First, paid undergraduate students ($N = 38$) evaluated the typicality of each ad for the product in question

[3] See http://adage.com/datacenter/datapopup.php?article_id=127910 (last accessed March 2011).

(three items: "typical," "normal," and "fitting"; five-point scale from "not at all" to "completely"; $\alpha = 0.71$ across ads) and whether they had "seen this specific ad for this brand before" (five-point scale from "never" to "very often"). As expected, typicality scores were much higher for typical (M = 3.96) than atypical ads (M = 2.80; $F(1, 37) = 165.87$, $p < 0.001$), but scores on the "ad seen" measure were not ($F < 1$).

Second, an image analysis using Adobe Photoshop 10 followed by analysis of variance revealed no differences between ad types' objective visual features that have been shown to influence attention. There were no differences in brand size (Wedel and Pieters 2000), visual complexity (as measured by jpeg file size; see Pieters et al. 2010), or luminance levels (M and SD; see van der Lans et al. 2008) (all F values < 1).

Third, paid undergraduate students ($N = 39$) evaluated the familiarity of the advertised brands (brand names without ads) using a six-point response scale from "unknown" to "very familiar." Brands from typical ads (M = 4.33) were more familiar than were brands from atypical ads (M = 4.03; $F(1, 38) = 44.39$, $p < 0.001$). Therefore, we use the mean brand familiarity score per ad as the control variable in the studies. In Study 1, we examined gist perception of ads under varying short exposure durations.

5. Duration Effects

5.1. Study 1

Paid undergraduate students ($N = 100$, 56 males, mean age = 23) were randomly assigned to one condition of a 5 (exposure duration: 20, 60, 100, 140, 180 milliseconds) between-participants × 3 (image: typical ad, atypical ad, editorial material) within-participants mixed design. Participants saw 40 images—namely, 32 ads (8 per product category: cars, financial services, food, and skincare, 4 were typical and 4 were atypical) and 8 pages with editorial material. Image order was counterbalanced to control for serial-position effects. The total number of observations was 4,000 (100 participants × 40 images).

This and the subsequent studies followed a similar procedure (Rousselet et al. 2005). Image presentation and response measurement were carried out using Macromedia Authorware 7 (Kellogg and Bhatnagar 2005). Participants sat in normally lit, individual cubicles, 50 to 60 centimeters from a 17-inch thin film transistor monitor-computer with a maximum resolution of 1,024 × 768 pixels. Images were shown centrally and almost filled the screen vertically, with a display area subtending approximately 20° (horizontal) and 26° (vertical) of visual angle at the viewing distance.

Participants read instructions on the screen and did a practice trial. Then actual data collection started.

Figure 2 Setup of a Trial

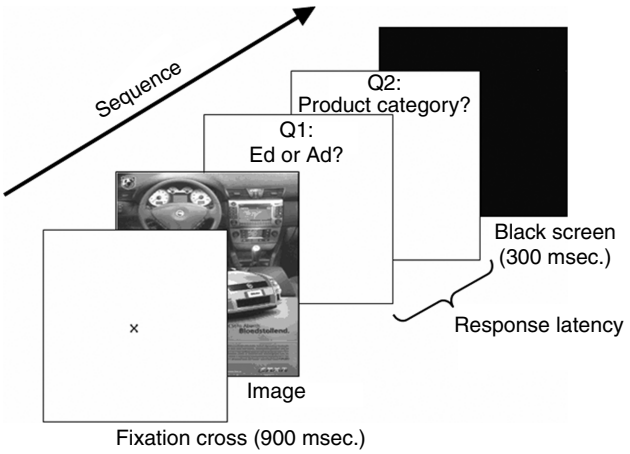


Figure 2 presents the setup of a single trial. To direct the eye gaze, a fixation cross (about 0.1° of visual angle) appeared on the screen for 900 milliseconds. This was immediately followed by an image presented in the middle of the screen for a duration depending on the exposure condition (20, 60, 100, 140, or 180 milliseconds between participants). These brief exposures prevent saccadic eye movements and reflect exposure durations within a range of normal fixation times (Rayner and Castelhano 2007). They serve the purpose of manipulating the amount of visual information that is available for processing. Immediately after this, question 1—"Is it an advertisement or editorial?"—appeared on the screen with the two response options that participants could select and confirm by mouse clicks. If participants selected "editorial," a black screen appeared for 300 milliseconds, after which a new trial began. If they selected "advertisement," a new screen appeared with question 2: "To which product category does the ad belong?" with response options, namely, car, financial services, food, and skincare. After responding, a black screen appeared and a new trial began until the end of the image set.

5.2. Model

Dependent variables were the accuracy and latency of perception of ad and product gist. Latency is the time (log-seconds) between the onset of a particular question and confirmation of the response. Independent variables were *Ad* or *Ed* (A), *Typicality* (T), *Exposure duration* (E), *Exposure duration squared* (E^2), the interactions of E and E^2 with A and T, and *Brand familiarity* as a control.

Our model (Equations (1) and (2)) generalizes the heterogeneous nested multinomial logit model (Lahiri and Gao 2002). It accounts for the facts that accuracies are binary (1 = yes, 0 = no), latency is log-normal, and product category responses are nested in the (correct) *Ad*/*Ed* responses; parameters are heterogeneous

to control for unobserved differences between participants and ads. We let $i = 1, \ldots, N$ denote participants and $j = 1, \ldots, J$ denote images (32 ads and 8 editorial pages). For the first stage of the model, the (4×1) vector $x_{i,j}$ contains the constant, effect-coded variables for *Ad* or *Ed* ($0.2 = Ad$, $-0.8 = Ed$), *Typicality* ($0.5 =$ typical, $0 =$ editorial, $-0.5 =$ atypical), and *Brand familiarity* ratings. For the second stage of the model, $w_{i,k}$ is a (3×1) vector that contains the constant, *Typicality*, and *Brand familiarity*. Ad and product accuracy, $y^a_{i,j,1}$ and $y^c_{i,k_i,1}$, are Bernoulli variables with success probabilities $\pi^a_{i,j}$ and π^c_{i,k_i}. The latencies are denoted by $y^a_{i,j,2}$ and $y^c_{i,k_i,2}$. Here, $1, \ldots, k_i$ indicates the set of ads that was correctly identified by participant i in the first stage and for which the product category question was asked (we drop the subscript i on k for ease of notation). The ad-level model is specified as

$$\begin{aligned}
\text{logit}(\pi^a_{i,j}) &= x'_{i,j}\beta^a_i + \phi \log(IV_{i,j}) + \rho^a \varepsilon^a_{i,j},\\
\log(y^a_{i,j,2}) &= x'_{i,j}\alpha^a_i + \varepsilon^a_{i,j},\\
\text{logit}(\pi^c_{i,k}) &= w'_{i,k}\beta^c_i + \rho^c \varepsilon^c_{i,k},\\
\log(y^c_{i,k,2}) &= w'_{i,k}\alpha^c_i + \varepsilon^c_{i,k}.
\end{aligned} \tag{1}$$

The parameters ρ^a and ρ^c capture the covariance between the residuals of the accuracy and latency equations for ad-level and product-level gist, respectively, using a parameterization by Wooldridge (2002). Here, $\varepsilon^a_{i,j} \sim \text{N}(0, \sigma^2_{y,a})$ and $\varepsilon^c_{i,k} \sim \text{N}(0, \sigma^2_{y,c})$ are the residual components of latency. $IV_{i,j}$ is the inclusive value that accounts for the nested structure of the ad-level gist and product-level gist responses (Lahiri and Gao 2002).

We let the (3×1) vector z_i contain a constant, exposure duration (E) ($-1 = 20$ milliseconds, $-0.5 =$ 60 milliseconds, $0 = 100$ milliseconds, $0.5 = 140$ milliseconds, and $1 = 180$ milliseconds), and its square (E^2) to allow for diminishing returns of increasing exposure durations (Loftus and Harley 2004). For each of the $p = 1, \ldots, P$ parameters in the ad-level model (Equation (1)), the individual-level model (Equation (2)) specifies the means of the distributions of the individual-specific coefficients as functions of the between-individual factors (exposure duration, E and E^2):

$$\begin{aligned}
\beta_{i,p} &\sim \text{N}(z'_i\lambda_p, \sigma^2_{\beta,p}),\\
\alpha_{i,p} &\sim \text{N}(z'_i\theta_p, \sigma^2_{\alpha,p}).
\end{aligned} \tag{2}$$

This and the models for the other studies are estimated with Markov chain Monte Carlo (MCMC), using WinBugs (Lunn et al. 2000). Posterior means and standard deviations of the model hyperparameters are reported from 20,000 MCMC draws from which 1 in 10 are retained after a burn-in of 30,000. Table 1 and Figure 3 summarize the results.

Table 1 Typicality and Duration Effects

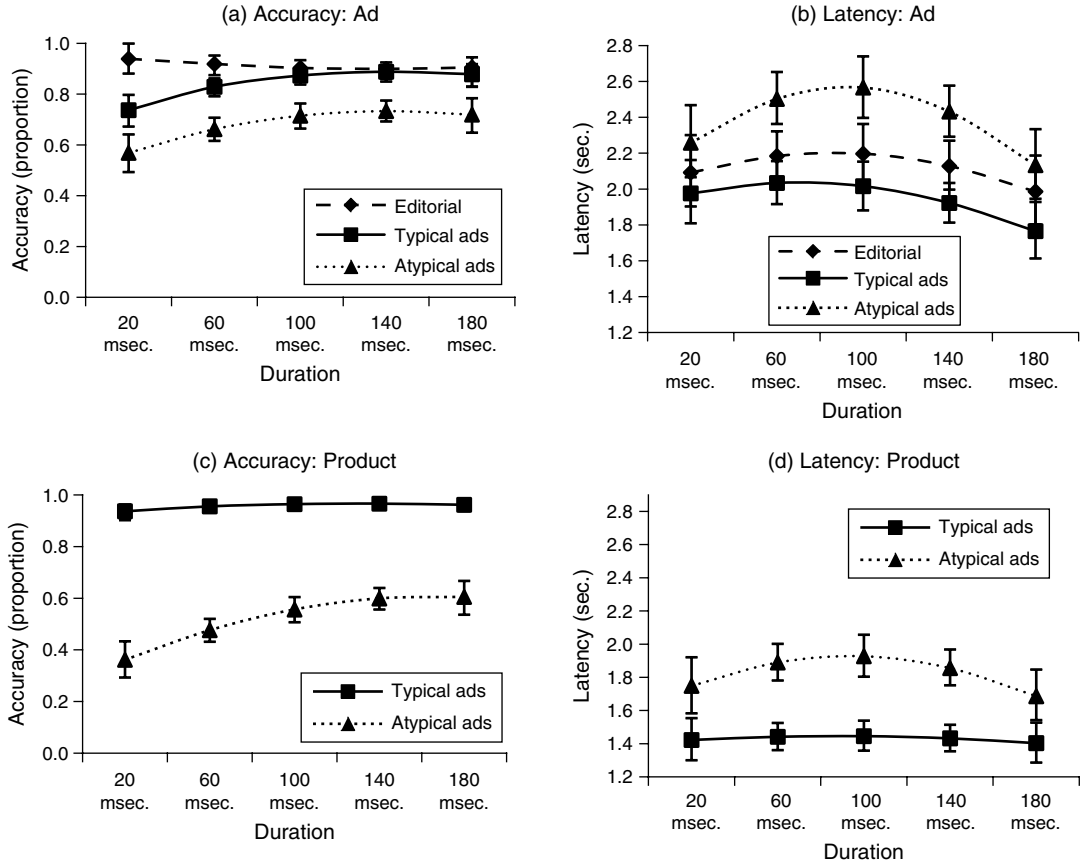
	Ad identification			
	Accuracy		Latency	
Parameters	Mean	SD	Mean	SD
Constant	**0.965**	**0.296**	**0.880**	**0.038**
Ad or *Ed* (*A*)	**−1.406**	**0.354**	**0.117**	**0.035**
Ad typicality (*T*)	**0.663**	**0.311**	**−0.235**	**0.024**
Exposure duration (*E*)	**0.125**	**0.047**	−0.020	0.014
Exposure duration squared (E^2)	−0.057	0.039	**−0.027**	**0.012**
$A \times E$	**0.302**	**0.143**	−0.008	0.011
$A \times E^2$	−0.150	0.114	−0.010	0.009
$T \times E$	0.063	0.065	−0.015	0.011
$T \times E^2$	−0.017	0.060	**0.020**	**0.009**
Brand familiarity	**1.277**	**0.433**	**−0.209**	**0.064**
Inclusive value	**0.123**	**0.111**	—	—
Heterogeneity (SD)				
Constant	0.441	0.067	0.192	0.015
Ad or *Ed*	1.404	0.218	0.068	0.014
Ad typicality	0.212	0.108	0.094	0.017
Error covariance	**−1.516**	**0.119**	—	—
Residual SD	—	—	0.352	0.004
	Product identification			
	Accuracy		Latency	
Parameters	Mean	SD	Mean	SD
Constant	**2.684**	**0.265**	**0.272**	**0.049**
Ad typicality (*T*)	**2.966**	**0.215**	**−0.303**	**0.032**
Exposure duration (*E*)	**0.186**	**0.054**	−0.005	0.013
Exposure duration squared (E^2)	−0.064	0.047	−0.017	0.012
$T \times E$	−0.129	0.105	0.006	0.015
$T \times E^2$	0.031	0.097	0.022	0.012
Brand familiarity	**−0.248**	**0.060**	**0.061**	**0.010**
Heterogeneity (SD)				
Constant	0.142	0.058	0.162	0.016
Ad typicality	0.189	0.093	0.085	0.019
Error covariance	**−0.834**	**0.119**	—	—
Residual SD	—	—	0.460	0.007

Note. Bold parameter estimates indicate that probabilities of the parameters to be larger or smaller than zero are greater than 0.95.

5.3. Results

5.3.1. Gist Perception: Ad. *Typicality*, *Brand familiarity*, *Ad/Ed*, *Exposure duration*, and the interaction between the latter two variables influence accuracy of gist perception at the ad level. Gist perception at the ad level is more accurate for typical than for atypical ads, even at the shortest exposure duration of 20 milliseconds (see Figure 3(a)). With increasing exposure duration, gist perception improves similarly for typical and atypical ads (from 73% to 86% and from 57% to 69%, respectively). Gist perception of typical compared with atypical ads is about 15% better across the whole range of exposure durations. Accuracy of gist perception rises monotonically, with some evidence (not significant) of a ceiling at a 100-millisecond exposure, after which it remains fairly constant.

Figure 3 Duration Effects on Perception of Ad Gist



Note. Error bars represent 2.5%–97.5% credible intervals.

Ad/Ed, *Brand familiarity*, *Typicality*, *Exposure duration*, and the interaction of the latter two variables influence latency of gist perception at the ad level (see Figure 3(b)). The latency of responding in the gist perception task is only somewhat slower for editorials (2.3 seconds) than for typical ads (2.1 seconds), but it is more than half a second (2.6 seconds) slower for atypical ads. Latency shows a quadratic relationship with exposure duration for all three types of images, but it is somewhat stronger for atypical than for typical ads, with the maximum latency occurring at about 100 milliseconds of exposure. The optimum computed from the estimates was 97 milliseconds for atypical and 87 milliseconds for typical ads. After this exposure duration, the response latencies become shorter, which reflects increasing certainty in gist perception (Lamberts 2000). Thus, for typical ads participants are certain about 10% sooner. Brand familiarity has the expected positive effect on accuracy ("better") and negative effect on latency ("faster").

5.3.2. Gist Perception: Product. *Typicality*, *Brand familiarity*, and *Exposure duration* improve accuracy of gist perception of the product. For typical ads, accurate gist perception at the product level, given that the image was perceived to be an ad, was extremely high (95%). The high accuracy is independent of the exposure duration (see Figures 3(a) and (c); net accuracy = ad accuracy × product accuracy, 78%). This provides evidence that gist perception of typical ads occurs jointly at the ad and product levels ("When you know it is an ad, you know what it is for").

For atypical ads, accurate gist perception at the product level was uniformly much lower (53%; net accuracy, 35%). It increased with exposure duration from 36% to 61%, with some (but not significant) evidence of diminishing returns and stable values after 100 milliseconds. Clearly, for atypical ads gist perception at the ad and product levels is dissociated ("When you know it is an ad, you may not yet know what it is for").

Typicality and brand familiarity affect latency of gist perception at the product level. Responses are again much faster for typical ads (1.6 seconds) than for atypical ads (2.2 seconds) and, although the duration effect was not significant, seem slowest at 100 milliseconds of exposure (see Figure 3(d)). Finally, the inclusive value coefficient indicates that the correlation because of the nesting of the questions is high, 0.877 ($1-\phi$).

Interestingly, although familiar brands enhanced the perception of images as ads rather than as editorial material (more accurate, faster) as expected, they inhibited perception of the specific advertised products (less accurate, slower), as shown in Table 1. We will return to these findings in the discussion section. Independent of the effect of brand familiarity, the gist of typical ads was perceived very accurately at the ad and product levels after exposures of only about 100 milliseconds, and it was already perceived well above chance levels at exposures of as little as 20 milliseconds. Gist perception of atypical ads lagged far behind at all exposure durations. The gist of atypical ads is perceived much less accurately at the product level than at the ad level. The covariation between accuracy and latency of gist perception was negative both at the ad and at the product levels (see Table 1): higher accuracies went hand in hand with faster response times. This is evidence that gist perception takes place largely automatically.

6. Coarseness Effects

Study 2 has two goals. First, it investigates whether typical and atypical ads differ in accuracy of gist perception at the product and at the brand level. Second, it further explores the limits of gist perception by degrading the visual information in the images from normal to extremely coarse (Loschky et al. 2005). This provides insights into how coarse these exposures can be—because they are in the visual periphery or when consumers or ads are moving—before ads stop communicating their gist.

6.1. Study 2

Paid undergraduate students ($N = 177$, 86 males, mean age = 21) were assigned to a condition of a 5 (coarseness: normal, low, medium, high, very high) between-participants × 2 (image: typical ads, atypical ads) within-participants mixed design.

The same 32 ads as in Study 1 were used without editorial pages because of the focus on product and brand levels of gist. Degree of coarseness was manipulated by changing the visual resolution in the images using the Gaussian Blur filter in Adobe Photoshop 10 (Loftus and Harley 2004, Rousselet et al. 2005). Different settings of the filter mimic exposure conditions from foveal vision (full detail) to peripheral vision (coarse visual information; see Loschky et al. 2005). In the "normal" visual condition, images were left intact. Based on pretesting, four degrees of coarseness were produced using filter settings of, respectively, 4 (coarseness, low), 8 (medium), 12 (high), and 24 (very high) pixels. Figure 1 presents a sample ad at these degrees of coarseness.

All ads were shown for 100 milliseconds given the Study 1 findings. The product question came directly after ad exposure. Upon responding, a new screen appeared with eight brand names from the product category that the participant had selected. Brand names were shown in alphabetical order in two columns of four. The rest of the procedure was as before.

Accuracy (1 = yes, 0 = no) of gist perception at the product and brand levels was examined. The model is the same as in Equations (1) and (2) but without the response latencies. The (4×1) vector $x_{i,j}$ contains a constant, *Typicality* (0.5 = typical, −0.5 = atypical), and *Brand familiarity* ratings. The (4×1) vector z_i contains a constant and *Coarseness* (C) (log-coarseness mean-centered: 0.01 = normal, 4 = low, 8 = medium, 12 = high, and 24 = very high), with numbers reflecting coarseness settings. The findings are in Table 2 and Figure 4.

6.2. Results

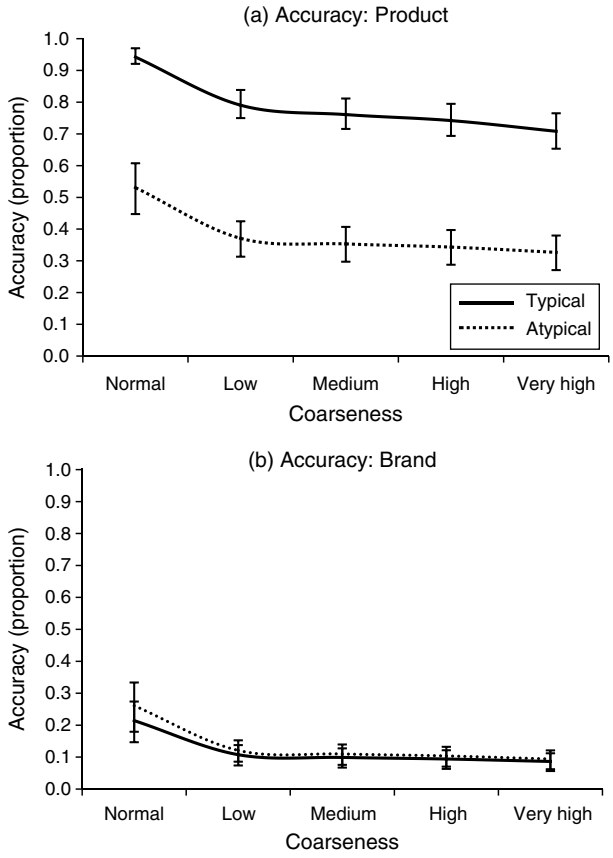
6.2.1. Gist Perception: Product. *Brand familiarity*, *Typicality*, *Coarseness*, and the interaction between the latter two variables influence accuracy of gist perception at the product level. Typical ads (estimated accuracy 95%) outperform atypical ads (61%) by a wide margin under normal visual conditions, as was the case in Study 1. Figure 4(a) shows this. With increasing coarseness, accuracy, of product perception drops significantly. Yet as expressed by the significant interaction ($C \times T$), the performance of typical ads drops significantly less (with 16% to 79%) than that of atypical ads (with 23% to 38%) as coarseness increases. This shows that, as hypothesized, atypical ads require more visual detail to uphold their already low accuracy of product perception. Even at severe degrees of coarseness, when only coarse "blobs" in the ad images remain, accuracy of product perception for typical ads is still remarkably high (70%), and typical ads still perform above chance (32%). As in Study 1, brand familiarity reduced the accuracy of product-level gist perception.

Table 2 Typicality and Coarseness Effects

	Product identification		Brand identification	
Parameter	Mean	SD	Mean	SD
Constant	**0.649**	**0.130**	**−1.855**	**0.163**
Coarseness (C)	**−0.178**	**0.018**	**−0.147**	**0.019**
Ad typicality (T)	**2.055**	**0.086**	**−0.162**	**0.090**
Brand familiarity	**−0.069**	**0.031**	**0.251**	**0.038**
$C \times T$	**−0.138**	**0.032**	0.021	0.026
Inclusive value	**0.873**	**0.121**	—	—
Heterogeneity (SD)				
Constant	0.311	0.052	0.529	0.059
Ad typicality (T)	0.187	0.083	0.199	0.081

Note. Bold parameter estimates indicate that probabilities of the parameters to be larger or smaller than zero are greater than 0.95.

Figure 4 Coarseness Effects on Perception of Ad Gist



Note. Error bars represent 2.5%–97.5% credible intervals.

6.2.2. Gist Perception: Brand. *Typicality, Coarseness*, and *Brand familiarity* influence accuracy of gist perception at the brand level. The detrimental effects of increasing coarseness are evident. Accurate brand perception drops from 46% (normal) to 26% (low), 25% (medium), 24% (high), and 22% (very high coarseness), yet it is still well above chance (12.5%) even at the highest degree of coarseness. Brand familiarity had a positive effect on accuracy of brand-level gist perception. Furthermore, the inclusive value coefficient indicates that the correlation induced by the nesting of the questions is low, 0.127 $(1-\phi)$.

Figure 4 shows that gist perception is much lower at the brand than at the product level: at least 50% in all cases. Accuracy of brand perception, conditional on the product being perceived accurately, is significantly better for atypical ads (29% across degrees of coarseness) than for typical ads (28%), although the differences are very small. Figure 4(b) shows this. Note, however, that the net accuracy of gist perception (product accuracy × brand accuracy) is much higher for typical compared with atypical ads because gist perception at the product level is much better for typical ads. Net accuracies at the brand level for typical ads and atypical ads are, respectively, 42% and 29% under normal visual conditions. They are, respectively, 20% and 10% at low, 18% and 9% at medium, 17% and 8% at high, and 15% and 7% at very high degrees of coarseness. Based on these findings, we develop a metric that reflects the gist performance of individual ads.

7. Ad Gist: Communication in a Single Glance

Advertisers want to know how well ads can communicate their meaning at the product and brand levels under adverse exposure conditions. This information can be used in ad development and testing and in media planning and selection. We develop a new metric, Ad Gist, to capture this. The metric is based on the accuracy of product and brand gist perception as assessed in Study 2 because these are arguably the most critical for advertising effectiveness. Based on Study 1, we use an exposure duration of 100 milliseconds, which is well within the duration of a single fixation. For the purpose of the metric, we represent differences between ads in a flexible manner (and do not constrain them to be a function of *Typicality* and *Brand familiarity* only) through the following general measurement model:

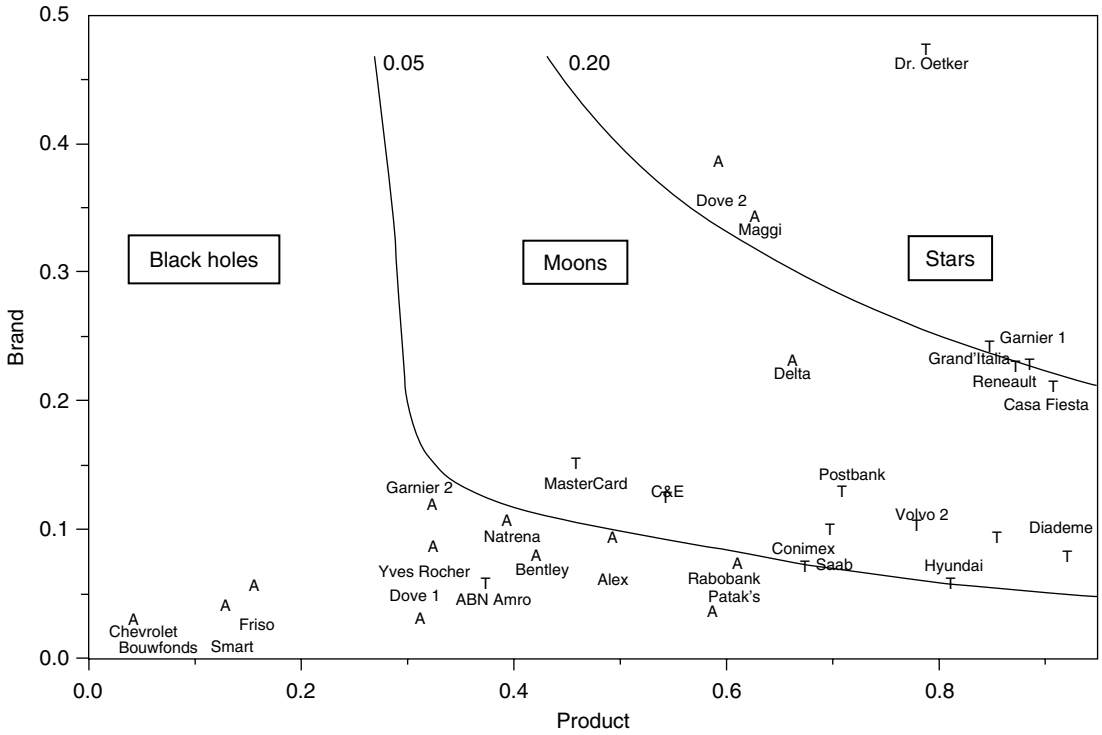
$$\begin{aligned}&\text{logit}(\pi^c_{i,j}(C)) = \beta^c_{i,0} + \omega^c_j, \quad \beta^c_{i,0} \sim \text{N}(\lambda^c_0 + \lambda^c_1 C_i, \sigma^2_c),\\ &\text{logit}(\pi^b_{i,j}(C)) = \beta^b_{i,0} + \omega^b_j, \quad \beta^b_{i,0} \sim \text{N}(\lambda^b_0 + \lambda^b_1 C_i, \sigma^2_b).\end{aligned} \tag{3}$$

The model specifies product- and brand-level accuracies hierarchically as a function of the level of *Coarseness* that participant I received in the study (C_i), and it includes crossed random ad effects, $\omega_j \sim \text{N}(0, \sigma^2_\omega)$, to capture differences between ads. Because many advertising exposures in practice occur across a range of situations where limited visual detail of various degrees is available, the Ad Gist metric measures the accuracy of gist perception across degrees of coarseness. It is based on the (normalized) integrals of the curves of product-level $\pi^c_j(C)$ and brand-level $\pi^b_j(C)$ gist perception accuracies as a function of *Coarseness* (C). The overall Ad Gist metric is then computed as the normalized product of these two integrals:

$$G_j \propto \int \pi^c_j(C)\, dC \cdot \int \pi^b_j(C)\, dC. \tag{4}$$

The integrals are approximated using the trapezoid rule. Ad Gist is normalized to be between zero and one by dividing by its maximum value, which is obtained by setting both accuracies equal to one for all values of coarseness. Thus, if the performance of the ad is insensitive to the removal of visual detail, the accuracy of product- and brand-level gist perception

Figure 5 Ad Gist Map: Communication in a Single Eye Fixation



Notes. Axes are estimated surfaces under the gist perception curves at the product (horizontal axis) and brand (vertical axis) levels. Advertised brands are shown; "T" is for typical and "A" is for atypical ads. Iso-contour lines are for Ad Gist values of 0.05 and 0.20, delineating classes of Star, Moon, and Black hole ads.

is high across all levels of coarseness, and the accuracy curve is uniform and approaches its maximum value. In that case the Ad Gist metric is also maximal. If either product- or brand-level accuracy reduces as a consequence of the removal of visual detail, the Ad Gist metric is lower, reflecting inferior performance under adverse exposure conditions. We present both components in Equation (4) separately as well. This may be important, for example, for advertising campaigns directed at brand awareness, for which these components receive different weight.

The Ad Gist map in Figure 5 reveals the performance of each individual ad in conveying the product and brand after less than a single eye fixation. The axes indicate the surfaces under the gist perception curves, separately at the product (horizontal axis) and brand (vertical axis) levels. Brand names of the ads are shown, with letters indicating typical (T) and atypical (A) ads. Inspection of the Ad Gist map shows that most ads that do well in getting the product across are typical (toward the right of the map), whereas most ads doing poorly are atypical (toward the left of the map). The pattern for the vertical axis is less clear, but here, atypical ads tend to have somewhat higher values. The best-performing ad overall, located in the top right corner of the figure, is the (typical) Dr. Oetker ad for frozen pizza shown in Figure 1. But other ads, including those for Dove and Garnier, do very well, too.

For the purpose of ad comparison and testing, we propose a three-tiered classification of the overall Ad Gist metric. The idea is that the higher the combined product and brand accuracy of an ad across degrees of coarseness, the better it communicates its gist under a wide range of coarse exposure conditions. Figure 5 shows that the ads fall naturally into three classes: two iso-contour lines, one for an Ad Gist value of 0.05 and one for a value of 0.20, delineate these.

Ads are a "Star" when the combined surface under the product and brand accuracy curves is above 20% of the theoretical maximum. They are a "Moon" when the metric is below 20% but above 5% and a "Black hole" when the metric is below 5% of the maximum attainable value. These cutoffs are based on the following reasoning. Stars do significantly better than chance both at the product and brand levels for all degrees of coarseness. These ads are all above a cutoff of 20% for the Ad Gist metric. Black holes do not do significantly better than chance, neither at the product nor at the brand level. These ads fall below a 5% cutoff for the Ad Gist metric. Moons are in between these two extremes. They do better than chance at the product level for all coarseness degrees but usually only do better than chance at the brand level for the original images. Among the six Stars in our data,

two are atypical (Dove and Maggi) and the remaining four ads are typical. Among the 14 Black holes in our sample, only one (ABN Amro) was a typical ad. This underlines the potential of a strategy based on ad typicality to communicate meaning in a single glance.

7.1. Immediate Interest in Ads

Study 3 investigates the immediate interest that typical and atypical ads receive. Paid undergraduate students ($N = 82$, 43 males, mean age = 23) saw the same 32 ads for 100 milliseconds, with the same procedure as in the previous studies, and were asked for each ad, "Is it interesting to you?," with a binary yes–no response option. We use a binary response scale because of the need to measure immediate interest. Reponses can be given very quickly, which is important because we want the nature of the response scale to interfere as little as possible with the processes being studied. The log-proportion of the sample indicating immediate interest was merged with the Ad Gist scores per ad from Study 2 (Equation (4)) and with the mean brand familiarity score per ad collected in pretest 3.

We performed a Bayesian mediation analysis (Zhang et al. 2009) to test whether immediate interest is higher for typical than for atypical ads and whether this is mediated by their Ad Gist performance, independent of brand familiarity. Bayesian mediation analysis provides exact inferences of mediation effects in finite samples. It also allows for nonsymmetric credible intervals, which is required because a mediation effect is a product of normally distributed parameters, which tends to have a skewed distribution. Two models were estimated. Model 1 established the influence that typicality has on Ad Gist ($G_{j,1}$) while controlling for *Brand familiarity*. Model 2 established the influence that Ad Gist has on immediate interest (I_j) while controlling for *Typicality* and *Brand familiarity*:

$$\begin{aligned} G_j &= x_j'\beta + \varepsilon_{j,1}, \\ I_j &= x_j'\alpha + G_j\gamma + \varepsilon_{j,2}. \end{aligned} \tag{5}$$

The (3×1) vector x_j contains a constant, *Typicality* ($0.5 =$ typical, $-0.5 =$ atypical), and the average brand familiarity ratings. The two equations were estimated simultaneously, with $(\varepsilon_{j,1}, \varepsilon_{j,2})' \sim \mathrm{N}(0, \Sigma_y)$, to establish the indirect effect of typicality on interest mediated by Ad Gist ($\beta\gamma > 0$). Table 3 reports the results.

Typicality has a positive effect on the Ad Gist metric, which is expected based on the findings of Studies 1 and 2 (Model 1), but *Brand familiarity* does not. The lack of significance of familiarity in this study may be due to the small sample size or the aggregation of the measure at the ad level. Ad Gist has a direct, positive effect on interest, whereas both *Brand familiarity* and *Ad typicality* do not. Thus, *Typicality* has a positive, indirect effect on immediate interest, which is mediated by Ad Gist (estimate = 0.245, SD = 0.139; the 95% credible interval is from 0.014 to 0.543). This shows that typical ads have a better Ad Gist performance than do atypical ads (19% and 6%, respectively) and generate more immediate interest (respectively, 70% versus 49% interest). Moreover, typical ads generate more immediate interest because of their better gist performance.

Table 3 Ad Gist Mediates Typicality Effects on Interest

	Model 1: Ad Gist		Model 2: Immediate interest	
Parameter	Mean	SD	Mean	SD
Constant	**−3.471**	**1.170**	**−0.217**	**0.403**
Brand familiarity	0.111	0.285	−0.015	0.087
Ad typicality	**1.948**	**0.580**	0.176	0.212
Ad Gist metric	—	—	**0.126**	**0.060**
Heterogeneity (SD)	1.607	0.214	0.498	0.068
Mediated typicality effect	—	—	**0.245**	**0.139**

Notes. $N = 32$ ads. Bold parameter estimates indicate that probabilities of the parameters to be larger or smaller than zero are greater than 0.95.

8. Conclusion

The present findings show how surprisingly fast and accurately the gist of typical ads can be perceived from coarse visual input. They reveal that accurate gist perception generates immediate interest in ads, which is of key importance because in highly competitive environments it allows ads to attract focal attention to gain downstream effects.

Typical ads had better gist perception. After an exposure of 100 milliseconds—much less than an average eye fixation—the gist of typical ads was accurately perceived at the ad and product levels in close to 90% of the cases. Atypical ads did much less well. They achieved around 70% accuracy at the ad level and around 40% at the product level. This reveals that previous findings that people can perceive the gist of scenes in a single glance cannot simply be generalized to advertising. In fact, the gist of typical ads was perceived in much *less* than a single eye fixation, but atypical ads may require *multiple* eye fixations to achieve the same performance. We found that gist perception of typical ads is based on coarse visual information, such as is captured across the entire retina including the extreme periphery, and that visual detail is not needed. Even exceptionally coarse images presented for only 100 milliseconds allowed consumers to accurately perceive typical ads and identify the advertised products and brands. The product was the basic level at which the gist of the ads was extracted. Still, the analysis of Ad Gist for specific ads showed that some ads communicated their gist

remarkably well at the brand level, and there may be a slight advantage for atypicality in communicating at that level.

8.1. Limitations and Future Research

We agree with Yang and Smith (2009) that although the ultimate goal of most advertising is to increase sales, this goal is already difficult to accomplish through ads that receive long, extended exposures with ample visual detail, let alone through the brief and coarse exposures that most ads get and that were investigated here. Our findings are limited to what ads *can* communicate in a single eye fixation under adverse exposure conditions, and we can neither generalize to what they *will* communicate in the long run nor claim downstream sales effects yet.

Exposure durations in the present studies were brief but supraliminal. Recent controlled studies have shown that under the appropriate conditions, ultrabrief, subliminal exposures to ads can influence brand attitudes and choice (Karremans et al. 2006, Strahan et al. 2002). However, in these studies subliminal exposures were repeated very frequently in a small time window, and they required an activated motivation in participants in order to be effective. As a case in point, Karremans et al. (2006) found that 25 consecutive subliminal exposures to the brand name "Lipton Ice" increased choice of the soft drink but only among participants who were thirsty. Such situations are rare in advertising practice, and subliminal advertising is banned in many countries. On the contrary, the present research studies the rapid comprehension processes that take place during the brief nonsubliminal exposures that most ads receive in practice. In this way, it bridges the literatures about what ultrabrief and ultralong exposures can establish. We see this research as a first step, and there are several avenues for future advertising research and theory development.

One research avenue concerns the communication effects of ad typicality over time. The present findings indicate that being typical is advantageous for ads after vey brief exposures. Yet there appears to be a natural tension in advertising communication between being typical (fitting in) and being atypical (standing out; see Goldenberg et al. 1999, Goodstein 1993). Research based on Mandler's (1982) theory has shown that it may be best for products and ads to be moderately atypical or incongruous (Meyers-Levy and Tybout 1989, Ratneswar and Chaiken 1991). We speculate that this may hold once initial comprehension has taken place, if the exposure is longer than what was studied here. In support of this, Pieters et al. (2002) found that original ads retained consumers' attention longer and led to improved brand memory after initial attention had been secured. Likewise, Smith and his colleagues (Smith et al. 2007, Yang and Smith 2009) found that after creative television commercials were watched in their entirety, they achieved better message processing, attitudes, and purchase intentions. We conjecture that it is not moderate atypicality per se that is most optimal. Rather, we speculate that it is most optimal to have sufficiently typical elements in the ad for fast gist perception and to create immediate interest, and to have sufficiently atypical ads to retain attention and to create desire, for a maximum effect. If their atypical elements are most salient initially, ads may fail to be immediately comprehended. And if their typical elements are most salient later on, ads may fail to sustain attention and secure long-term effects. To test this "distributed typicality" hypothesis, one should examine the formation of interest and attitudes across longer exposure durations than the first eye fixation that we focused on here. Such dynamic effects of typicality would have important implications for the design of TV and Internet commercials as these unfold over time but are relevant for static magazine, newspaper, or billboard advertising as well.

A second avenue for future research concerns the specific creative tactics and design elements in advertisements that improve gist perception. Although we carefully selected a comparatively large, heterogeneous set of ads, future research could use even larger sets of ads to achieve a better balance between tangible and intangible, durable and nondurable products. Such research might also experimentally manipulate creative tactics that influence ad typicality, such as pictorial analogies or extreme consequences (see Goldenberg et al. 1999). Furthermore, more research on the gist perception of ads in other media is relevant. We believe that our basic findings on magazine ads generalize to other ad types where all information is simultaneously available to consumers, such as outdoor, point-of-purchase, newspaper ads, and online ads. We believe that the proposed methodology is well suited to study static online ads, such as sponsored search and banner ads. These ads often compete with multiple other ads and editorial material on the same page, and consumers need to make rapid decisions to attend to them. In these highly competitive environments, it is even more important to generate immediate comprehension and interest.

A third research avenue concerns the influence of brand familiarity and brand symbols in early comprehension processes. Although it was primarily used as a control variable in the present study, brand familiarity systematically influenced gist perception. More familiar brands enhanced gist perception at the ad (Study 1) and brand levels (Study 2) but inhibited gist perception at the product level (Studies 1 and 2). The enhancement effect is consistent with literature on the

attention capture effects of familiarity, as reported in cognitive psychology (Christie and Klein 1995) and advertising research (Pieters and Wedel 2004). The inhibition of product gist performance may be due to response competition in the visual cortex (Scalf and Beck 2010). Our findings point to the possibility that for very familiar brands, the basic level of gist perception may be the brand, and the product is the subordinate level. Then because of competing responses at these two levels, the subordinate product-level response is inhibited (Scalf and Beck 2010), which was confirmed in both of our studies. It is noteworthy that these effects were obtained after exposures of less than a single eye fixation and under coarse exposure conditions. They are early signs of brand equity revealed from responses to advertising. Future research may examine how unique perceptual features of familiar brands (Dove's blue color), objects (the Michelin Man), and coarse layouts (Marlboro Country) and factors such as repeated exposures can jointly improve brand gist perception.

8.2. Implications

The present findings have implications for advertising theory and practice. Quite unexpectedly, because we included them mostly as distracter images, editorial material was perceived highly accurately even at the shortest exposure duration. We note that we selected typical editorial material only, which generally contains large, orderly blocks of text and smaller pictorials. This layout is apparently easily recognized even under brief and coarse exposures. One increasingly popular advertising strategy is to present ads in such an editorial format. Advertisers like such *advertorials* because they add credibility to their message and blend in with the editorial content. Media owners are increasingly hesitant because editorial credibility may suffer from this strategy.[4] When an advertiser's goal is to provide a service to consumers, such as by adding recipes to food ads, ads should perhaps initially be perceived to be editorial material. Yet feelings of being duped by such "false-front" ads once they receive subsequent attention may backfire on the advertised brands and on editorial credibility. We suggest that future research examine the conditions under which this occurs; the methodology that we propose may help advertisers and media to assess the boundaries of accurate identification of ads and editorials.

Whereas previously the vast numbers of ads that received no more than a single glance seem to have been considered wasted, the proposed Ad Gist metric captures what ads can communicate under those adverse conditions. It taps the outcomes of early ad comprehension processes. In media planning, findings from the proposed Ad Gist methodology may be used to convert "raw" opportunities-to-see into confirmed impressions of ads (Danaher et al. 2010). The "astronomic" classification of Star, Moon, and Black hole ads may help advertisers and agencies determine which ads instantly communicate the advertised product and brand. Although information about long-term impact of advertising cannot easily be overstated, information about the immediate gist perception of ads is vital when testing, selecting, and adapting ads that need to perform well in cluttered environments under adverse exposure conditions.

[4] See Gonser (2003).

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