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Solving the Distinctiveness – Blindness Debate: A Unified Model for Understanding Banner Processing

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Abstract

Online designers have widely adopted banners as a popular online advertising format. However, because of their low click-through rates, marketers have recently questioned the effectiveness of banners. A phenomenon called "banner blindness" suggests that salient stimuli, such as banners, are often missed by Internet users. This contradicts the distinctiveness view, which argues that salient stimuli are more likely to attract a user's attention and enhance the click-through rate. To solve this debate, we develop a research framework to explain from an evolutionary perspective how the banner processing mode evolves. More specifically, we develop a process model that shows the transitions between three banner processing modes – automatic salience capture, controlled salience suppression, and automatic salience suppression. In addition, a unified variance model is proposed to solve the distinctiveness – blindness debate. Specifically, we propose that the habituation level and the task type can moderate the effects of structural factors and semantic factors on attention. We also discuss empirical strategies for examining the model and future research.

***Keywords**: Banner Blindness, Distinctiveness View, Attention, Evolutionary Perspective, Advertising Value, Dual Processing Theory, Habituation.*

* Ping Zhang was the accepting senior editor. This article was submitted on 29th July 2009 and went through three revisions.

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Solving the Distinctiveness – Blindness Debate: A Unified Model for Understanding Banner Processing

1. Introduction

Banner advertisements (ads), which are generally defined as small, typically rectangular graphic image or display on a webpage that link to a target site or product (Lohse & Spiller, 1998; Novak & Hoffman, 1997), are one of the most widely adopted online advertising formats (Briggs & Hollis, 1997). Several other reports, such as the Interactive Advertising Bureau's (IAB) annual report, also call them display ads. According to the IAB Internet Advertising Revenue Report, the revenue from banner ads reached about 3.38 billion dollars in 2010 (IAB, 2011). However, the great economic value of banner ads cannot totally alleviate ad sponsors' worries concerning banner ads' true effectiveness. For example, Li and Leckenby (2007) point out that the click-through rates (CTR) of banner ads declined from an average of 3 percent in the mid-1990s to 0.5 percent in the early 2000s and to 0.28 percent in the first quarter of 2003. Burke, Hornof, Nilsen, and Gorman (2005) also state that banner ads, which formerly attracted a substantial investment from marketers, might be ignored and forgotten by today's Internet users. These statistics naturally led web advertising sponsors to doubt the current effectiveness of banner ads. They ask: "Do banner ads really work?".

There have been two opposing views on the effectiveness of banner ads in the existing literature on web advertising: the distinctiveness view and the banner blindness view. Researchers who advocate the distinctiveness view argue that banner ads, which are always designed with such salient features as prominent position, impressive size, bright color, and animation (Faraday, 2000), are more likely to attract attention and arouse awareness, as suggested by the guideline of "the larger an item is, the greater its perceived visual importance and likelihood of attracting attention" (Detweiler & Omanson, 1996). The distinctiveness view assumes that people process banner ads according to a stimulus-driven or bottom-up mode (Yantis, 1998) through which people passively react to the stimuli in the external environment. More importantly, this stimuli-response pattern is regarded as being determined by innate elements (which cannot be changed by the learning process) in human nature.

In contrast, Benway and Lane (1998) propose the banner blindness view and reach a different conclusion. Specifically, they believe that the so-called salient visual elements cannot outperform the non-salient visual elements. Via an experiment, Benway and Lane (1998) proved that participants paid little attention to banners regardless of whether or not they were large, image-style or animated. Moreover, Cho and Cheon (2004) claim that people tended to intentionally suppress online ads both in their cognition and response, and that this intentional suppression induced banner blindness and a low click-through rate (CTR). In general, this stream of thought holds that people process stimuli according to a goal-directed or top-down mode (Yantis, 1998). That is, people can intentionally focus their attention on what they perceive as being relevant and can ignore that which they consider to be irrelevant. In addition, this control behavior may even become an automatic process when it occurs frequently enough.

Although both of these two opposing views have their advocates, scholars have not sufficiently addressed the fundamental distinctions between these two views. It is also unclear if these two views are mutually exclusive (e.g., support for one view denies the validity of the other view) or whether or not they can coexist (e.g., both can be correct under different conditions). The lack of understanding about these issues is not helpful in providing a consistent and unified explanation for the effectiveness of banner ads, and may cause confusion in theory development process. To clarify the contradictory findings that arise from these two views, this study analyzes the differences between the two views with respect to their theoretical premises and underlying mechanisms, and proposes a unified framework on which to reconcile the differences between these two views. More specifically, the research objectives of the study are:

1. To understand the differences between the distinctiveness view and the banner blindness view that have been established by other researchers and the sources of their contradictory findings, and

2. To develop a unified theory that can be used to reconcile their contradictions and provide a consistent explanatory mechanism that can be effectively applied in different contexts.

To achieve the first objective, we review and synthesize the information presented in the existing literature on web advertising and the theoretical mechanisms that underlie the distinctiveness and blindness views with an emphasis on the information processing theory (Tam & Ho, 2006; Tam & Ho, 2005), the selective attention theory (Lavie, 1998; Yantis, 1998), and the dual processing theory (Schneider & Shiffrin, 1977; Shiffrin & Schneider, 1977). Our literature review suggests that contradictions in the distinctiveness and blind views stem from the difference in the fundamental premises about the attention selection rules (e.g., stimulus-driven versus goal-directed) and dispositional sources (e.g., biological versus learned). To achieve the second objective, we introduce task type and habituation level as two contingent factors that define the applicable scopes of the distinctiveness and blind views. In particular, we propose both process and variance models to integrate them. Further, because of the habituation process's importance in theorizing about the unified model, we also propose a model to explore the determinants of the various habituation levels.

This study makes several key contributions to the body of existing literature. First, this study enriches the body of web advertising literature by providing a deeper understanding of the differences between the distinctiveness view and the banner blindness view and the sources of their contradictions. Second, this study develops a unified model to reconcile their contradictions from an evolutionary viewpoint, and theorizes about the conditions under which the two views are applicable. Third, this study also theorizes about the key factors that influence the habituation process, which is an important step to understand the shift from the distinctiveness view to the banner blindness view.

2. Literature Review

2.1. The Distinctiveness – Blindness Debate

Although knowing how to design banner ads to make them effectively attract consumers' attention is of critical concern to both marketers and ad sponsors, the theoretical viewpoints concerning this issue are controversial. Generally, as mentioned previously, there are two competing views on the effectiveness of banner ads: the distinctiveness view and the banner blindness view. The distinctiveness view postulates that banners that are always designed with such salient structural features as impressive size, bright colors, animation, and so on, are more likely to attract people's attention (Hong, Thong, & Tam, 2004; Zhang, 2000). It assumes that stimuli with salient structural features will automatically attract people's attention irrespective of whether the content of the stimuli is relevant to their needs. In contrast, the banner blindness view, which was originally developed by Benway and Lane (1998), suggests a converse conclusion. It states that, when engaging in a visual search task, information seekers "miss the very items [that] the page designers want them to see [which are salient] and that would, in fact, help them reach their goal" (Benway & Lane, 1998). This theory implies that even stimuli with salient structural features can be automatically ignored even if their content is consistent with people's needs.

Table 1. Representative Literature on Distinctiveness View and Banner Blindness View

View	Literature	Research setting	Task type	Key findings
Distinctiveness view	(Zhang, 2000)	Artificial Webpages	Search	• Animation negatively affects subjects' task performance. • Task difficulty can weaken the influence of animation on task performance. • Similarity between animation and targeted stimuli can strengthen the relationship between animation and task performance. • Animation that is brightly colored has a stronger negative impact on task performance than does dull colored animation.
	(Zhang, 2001)	Artificial Webpages	Search	• Animation that appears during the middle or toward the end of an information-seeking task degrades performance more significantly than animation that appears at the very beginning. • Animation that appears and disappears repeatedly affects performance much more than animation that appears on the screen constantly. • Animation on the left side of the screen affects performance more than animation on the right side.
	(Hong et al., 2004)	Real Webpages	Search	• An animated target item shortens the response time and an animated non-target item lengthens the response time. • Local density weakens the influence of animation. • Animation cannot increase recall. • Animation has negative effects on focused attention.
	(Hong et al., 2007)	Real Webpages	Search Browse	• An animated item is more likely to be clicked. • Users' task performance (shopping time and number of clicks) is negatively affected in the presence of animation. • The negative effects of animation on task performance are greater in browsing tasks than in searching tasks.
Banner blindness view	(Benway & Lane, 1998)	Real Webpages	Search	• Banners are missed under all conditions. • Banners located higher on the page were missed more often then those located lower down. • Banners are missed more often when located on pages containing links to general categories than when located on pages with links to specific items.
	(Pagendarm & Schaumburg, 2001)	Real Webpages	Search Browse	• Subjects from the aimless browsing group have better recall and recognition rates of banners than do subjects from the information searching group.
	(Bayles, 2002)	Real Webpages	Search	• No significant relationships were found between the use of animation and the ability of website users to recall and recognize banner ads.
	(Burke et al., 2005)	Artificial Webpages	Search	• Participants reported a higher level of workload with flashing text than in three other use situations: blank banners, static banners, and animated banners. • Both animated and static commercial banners decrease visual search speeds. • Eye tracking of data reveals that people rarely look directly at banners. • Low banner recall was found to be typical, and the content of animated banners was found to be more difficult to remember than that of static banners.

To understand the origins of the contradictory findings, we first review and then compare the empirical studies that advocate each view (see Table 1). A thorough examination of these two streams of research show that they differ in two major aspects. First, these studies' research designs were different. Most studies that support the distinctiveness view were conducted using artificial Webpages as the experimental material (which were designed solely for the study and had only certain string or image stimuli) and involved subjects completing visual search tasks (Burke et al., 2005; Zhang, 2000; Zhang, 2001). In other words, the webpages were artificially designed to investigate whether people would respond to stimuli with salient features differently than they would respond to stimuli with non-salient features. Such a method is similar to that used in visual search research in cognitive psychology. As to this method, subjects were required to deal with unique situations that had not appeared in their prior experience. In contrast, those studies that support the banner blindness view used real Webpages as the basis of their research design. Here, the webpages were similar to ordinary webpages. For example, in some studies, the website used in the study was modified based on real, existing websites (Bayles, 2002; Benway & Lane, 1998; Pagendarm & Schaumburg, 2001). On these webpages, it is possible for subjects to respond to the stimuli partially based on their prior experience in the real world.

Second, task type can be regarded as a distinguishing criterion of the distinctiveness and blindness views. Task, for example, can be classified as searching tasks in which subjects are asked to search for certain specific visual items and browsing tasks in which subjects are allowed to aimlessly scan the content of the webpage. Both distinctiveness and banner blindness researchers agree on the important role of task type in attracting attention. For example, Pagendarm and Schaumburg (2001) believe that task difference can attribute to the differences between the distinctiveness view and the banner blindness. They theorize that people are more likely to ignore banners when performing a searching task than when performing a browsing task. Consistent with this theory, Hong, Thong, and Tam's (2007) findings also support the theory that animation is more effective for the subjects' browsing task than for their searching task.

These observed differences between the distinctiveness view studies and blindness view studies somewhat explain the contradictions inherent in these two views. However, the underlying mechanisms behind how these differences lead to contradictory findings are not yet well understood. Therefore, in Section 2.2, we draw from a series of theories on banner processing to examine the role of the observed differences.

2.2. Theoretical Underpinnings

2.2.1. Banner Processing Model

Drawing on the classical information processing theory (which follows the stimulus–organism–response paradigm (Jacoby, 2002), we propose the banner processing model, which is depicted in Figure 1. The classical information processing paradigm assumes that external stimuli are processed in two cognitive stages: 1) the attention stage, at which people need to expend relatively little cognitive effort to process the peripheral cues, and 2) the elaboration stage, at which people have to expend considerable effort to elaborate on the details of the information provided (Tam & Ho, 2006; Tam & Ho, 2005). In our research context, the structural processing and the semantic processing reflect attention and elaboration (Lang, Borse, Wise, & David, 2002). The corresponding relationships between the information processing behavior and the banner processing behavior are based on several considerations. First, the structural features (such as the color and the size of banners) are processed before the semantic features (such as the informativeness and entertainment aspects of banners) (Lang, 2000), which is consistent with the sequential relationship between attention and elaboration. Second, attention allocation is more closely related to structural features rather than semantic features because processing semantic features always requires more cognitive effort (Tam & Ho, 2005), while elaboration is strongly associated with the semantic features and asks for more cognitive effort. However, we should note that some semantic features that require less cognitive effort can also directly elicit attention. For example, Tam & Ho (2005) found that users pay more attention to banners that refer to their names (e.g., self reference). In our study, we paid special attention to the semantic features that required a relatively high level of cognitive effort, and excluded self references from the discussion. In this regard, we also proposed that banner processing follows the structural – semantic processing sequence.

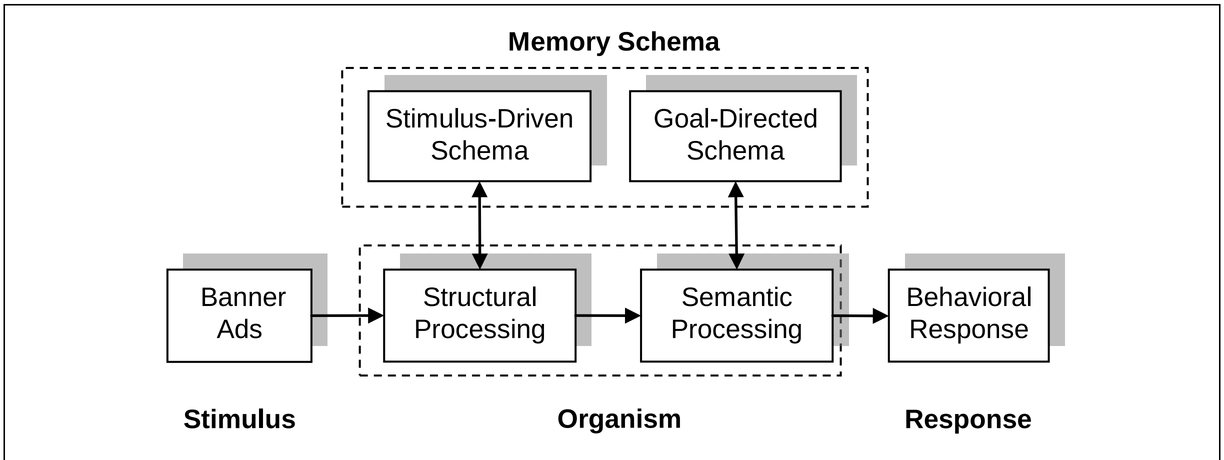

Figure 1. Banner Processing Model

Memory schema is an important concept for understanding banner processing, and can be defined as an organized pattern of thought or behavior directing how people respond to external stimuli (Pagendarm & Schaumburg, 2001; Tam & Ho, 2006). It has a dyadic relationship with the information processing process. On one hand, when dealing with a new task, people draw on their existing schema to process the new information. On the other hand, the knowledge generated from processing the new information can also be registered back to the memory schema, which forms a feedback loop. During this process, the new knowledge may modify the memory schema in two different ways: 1) the prior memory schema may be augmented when it is consistent with the new knowledge, or 2) the prior memory schema may be weakened when it is inconsistent with the new knowledge. Through the dyadic interaction between the memory schema and the information processing process, a person's information processing pattern can evolve over time.

2.2.1 Structure of Schema

To understand the structure of a schema that defines the information processing pattern, we should consider classical attention theory, which postulates that, because humans have limited cognitive capacity or resources to simultaneously carry out various mental operations (Zhang, 2000), they must selectively allocate their cognitive resources to different stimuli. Thus, some stimuli receives attention while others do not (Lavie, 1995; Pashler, 1998; Theeuwes, 1992a; Yantis, 1998; Zhang, 2000). There are two mechanisms to allocate cognitive resources: 1) the stimulus-driven mechanism through which people process stimuli in a bottom-up fashion. Here, stimuli with the most salient features indeed capture the observers' attention regardless of their goals (Theeuwes, 1992a; Theeuwes, 1992b), and 2) the goal-directed mechanism, which proposes that humans allocate their cognitive resources in terms of their task goals (Folk, Remington, & Johnston, 1992; Folk, Remington, & Wright, 1994). Although there were formerly debates about these two mechanisms, contemporary researchers now tend to consider the attention process to be a hybrid of stimulus-driven and goal-directed mechanisms. As Yantis (1998) states, "All deployments of attention, including those that may appear to be purely stimulus-driven, are necessarily implementations of a top-down attentional control setting" (p. 84). More importantly, some researchers now propose that, although stimulus-driven and goal-directed mechanisms may co-exist, their relative strengths may vary across different contexts. For example, Pagendarm & Schaumburg (2001) found that the stimulus-driven mechanism dominated the attention process under the browsing condition while the goal-directed mechanism dominated the attention process under the searching condition.

To connect the attention mechanisms and the memory schema, we propose a memory schema that merges the stimulus-driven and the goal-directed schemata. Structural and semantic processing activities can respectively modify the stimulus-driven and the goal-directed schemata. Specifically, structural processing activities can enhance humans' knowledge of the structural features and may help them process the structural features more efficiently. Semantic processing activities, on the other hand, can enhance their beliefs or attitudes toward banners, which can further define their general attitude toward banners, which can be used to direct processing specific banners in future (Cho & Cheon, 2004). Therefore, although semantic processing cannot influence structural processing in a one-off information-processing situation because semantic processing occurs after structural processing, from a longitudinal perspective, past semantic processing can influence future structural processing through modifying the observer's goal-directed schema, which can then be used to define future structural processing.

2.2.2. Evolution of Schema

Dual processing theory can be used to gain an understanding of the evolution of schema. It proposes two information processing modes: automatic processing and controlled processing (Schneider & Shiffrin, 1977; Shiffrin & Schneider, 1977). Automatic processing refers to the activation of a sequence of nodes in an automatic way "without the necessity for active control or attention by the subject" (Schneider & Shiffrin, 1977, p. 2). It can be regarded as a process primarily determined by the stimulus-driven schema. A controlled process is "a temporary sequence of nodes activated under control of, and through attention by, the subject" (Schneider & Shiffrin, 1977, p. 2) and is "applied in novel situations for which automatic sequences have never been learned" (Schneider & Shiffrin, 1977, p. 3). This process can be treated as being determined by the goal-directed schema.

Further, the dual processing theory also suggests that there are two types of automatic processing: the automatic process based on biological dispositions and the automatic process based on learned dispositions (Hong et al., 2007). Biological disposition refers to a human's natural tendency to respond to stimuli, which can be traced to biological evolution. Learned disposition refers to the information processing pattern shaped by people's past behavior. The difference in the two types of automatic processes stems from their origins; that is, whether they were derived from a controlled process (see Figure 2).

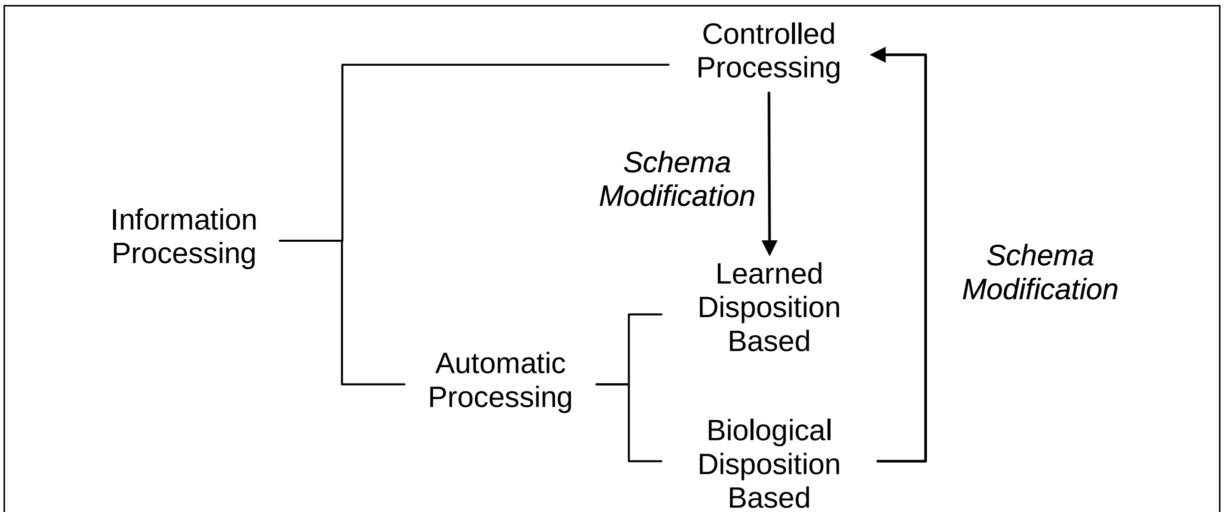

Figure 2. A Typology of Information Processing

From an evolutionary perspective, the dual processing theory describes the transitions between different information processing modes. If a controlled process is repeated for a sufficient number of times through consistent training, goal-directed schema's strength will be weakened while the stimulus-driven schema's strength will be enhanced, which finally leads to automatic processing (Schneider & Shiffrin, 1977). It suggests that the transformation from controlled processing to learned disposition is based on automatic processing. On the other hand, if a novel situation appears, the stimulus-driven schema may not be adequate to deal with the situation and the goal-directed schema may be activated, which would cause the automatic processing to transform into controlled processing (Lim, Benbasat, & Todd, 1996; Logan, 1988; Logan, 1992). This suggests the transformation from a biological disposition-based automatic processing to controlled processing.

3. An Evolutionary Process Model of Banner Processing

The aforementioned banner processing model helps to explain how differences in a research design can lead to different conclusions. An important distinction between using artificial and real webpages is that, when interacting with a real webpage (which resembles what a person has encountered before), people can modify their schema based on what they learned from their prior experience. On the other hand, this schema modification process cannot be reflected through the use of artificial webpages. Therefore, to accurately capture banner processing behavior in the real world, researches should consider an evolutionary view of banner processing.

The dual processing theory and the typology of information processing provide the necessary insights to view banner processing from an evolutionary perspective. Corresponding to the biological disposition based on automatic processing, controlled processing, and the learned disposition based on automatic processing, we use a three-stage model to describe the evolution of banner processing; namely, automatic salience capture, controlled salience suppression, and automatic salience suppression (which Figure 3 shows).

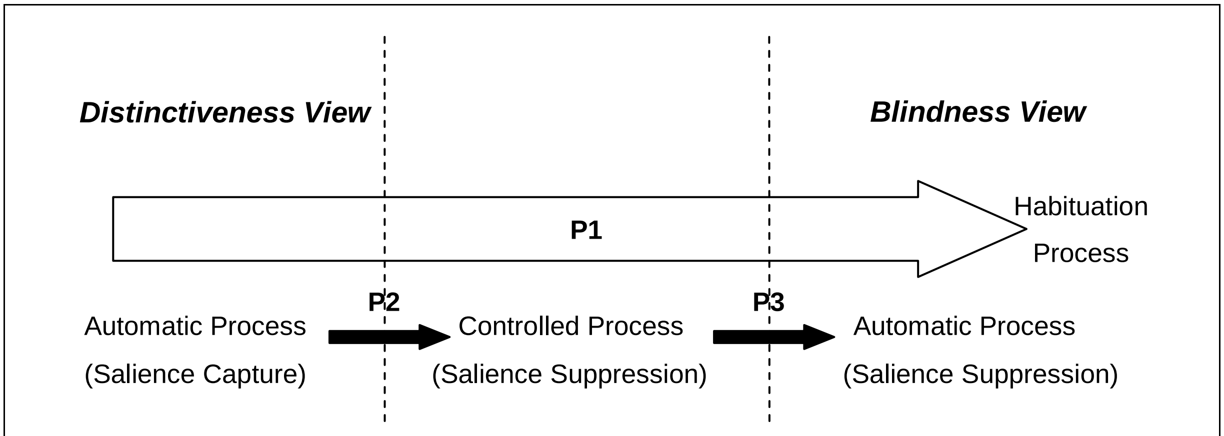

Figure 3. An Evolutionary View of Banner Processing Mode

Consistent with the distinctiveness view, automatic salience capture represents the biological disposition based on automatic processing through which salient visual elements can automatically draw people's attention (Hong et al., 2007). The stimulus-driven mechanism dominates the schema for this banner processing mode (Yantis & Hillstrom, 1994), and external stimuli can elicit an orienting response without the subjects' active control (Lang et al., 2002). This response is applicable to situations where people first encounter a banner before forming a memory schema through learning. In such situations, the stimuli-driven schema suggests a salience capture tendency due to a biological disposition, while the goal-directed schema does not play an important role because the feedback from the semantic processing has not yet been generated. Therefore, the combined result of these two mechanisms leads to an automatic salience capture.

However, the automatic salience capture mode may not be consistent because people can augment or weaken their memory schema according to their past banner-processing experience (Tam & Ho, 2005). Once different forms of feedback such as beliefs and attitude derived from the semantic processing have been generated to modify the goal-directed schema, the banner processing mode will change. At this stage, there are two possibilities for schema to be modified. One possibility is that people form a positive attitude toward the banner leading to a goal-directed schema, which in turn directs the salience capture. Because this is consistent with the stimulus-driven schema, the total schema still suggests salience capture. In contrast, when people have a negative attitude toward the banner, the goal-directed schema will lead to salience suppression rather than capture behavior. In this situation, people will tend to exert more control over their future banner processing behaviors to deal with the inconsistency that lies between the goal-directed schema and the stimulus-driven schema (Lim et al., 1996; Logan, 1988; Logan, 1992). The later possibility is consistent with the findings of many studies on banner advertising. These studies have shown that most people consider banner ads as intrusive (Edwards, Li, & Lee, 2002; McCoy, Everard, Polak, & Galletta, 2007), irritating (Ducoffe, 1996), and distracting (Cho & Cheon, 2004). These negative evaluations cause people to purposefully avoid allocating cognitive resources to banners (Cho & Cheon, 2004; Edwards et al., 2002). In this case, the active control of attention causes the banner processing mode to transfer from an automatic salience capture mode to a controlled salience suppression mode. Both the stimulus-driven schema and the goal-directed schema direct the controlled salience suppression, which is a transitional process that takes place between the automatic salience capture and the automatic salience suppression. The relative powers of these two schemata change along with the banner processing activities. If the semantic processing consistently indicates a negative attitude toward banners, the power of a goal-directed schema will increase, while the power of a stimulus-driven schema will decrease. Gradually, the goal-directed schema may dominate, and the stimulus-driven schema that directs the salience capture may lose its impact.

Once the goal-directed schema comes to dominate the banner processing, another type of stimulus-driven schema emerges. As previously explained, according to the dual processing theory, a controlled process can become automatic if the control behavior is repeated for an adequate number of times (Schneider & Chein, 2003). Thus, repeated banner-suppression behavior can activate the stimulus-driven schema that automatically directs the banner suppression. In this situation, both the stimulus-driven and the goal-directed schemata lead to banner suppression, which enhances the banner-suppression behavior. Following an increase in the frequency of the banner suppression behavior, the power of the goal-directed schema gradually becomes weaker, while the power of stimulus-driven schema becomes stronger. Finally, people come to automatically ignore the salient stimuli. Then, the controlled salience suppression mode is transformed into the automatic suppression mode. This transformation provides an explanation for the phenomenon of banner blindness noted by Benway and Lane (1998), which causes people to miss salient stimuli because they are totally unaware of their presence.

Overall, the evolutionary process that depicts the transitions between the three banner processing modes provides a way to solve the debate between the distinctiveness and blindness views. Thus, we propose that:

> ***Proposition 1:*** *From an evolutionary viewpoint, the banner processing mode may transit from automatic salience capture to controlled salience suppression and to automatic salience suppression*.

Next, we describe the conditions that facilitate the transition from one banner processing mode to another. Based on the evolutional view that we propose in Section 2.2.2, the transition from automatic salience capture to controlled salience suppression is driven by users' negative evaluations of banners, which are derived from semantic processing. These negative evaluations can modify the users' goal-directed schema that shapes the salience suppression behavior. In this way, the automatic salience capture mode is destroyed while the controlled salience suppression mode emerges. In contrast, if banners elicit positive rather than negative evaluations, users will modify their goal-directed schema by augmenting the salience capture mode. In this situation, the banner processing mode will not transit from automatic salience capture to automatic salience suppression. In other words, whether the transition from the automatic salience capture mode to the controlled salience suppression mode will occur or not depends on whether the evaluations of the banners are positive or negative. When the evaluations are positive, the automatic salience capture mode will be further augmented. On the other hand, when the evaluations are negative, the controlled salience suppression mode will replace the automatic salience capture mode. Several prior empirical studies support our argument that, when banners elicit negative evaluations from users such as irritation or feelings of intrusiveness and distraction (Cho & Cheon, 2004; Edwards et al., 2002), the transition from automatic salience capture mode to controlled salience suppression mode would occur. Thus, we propose that:

Proposition 2: *Banner processing changes from the automatic salience capture mode to the controlled salience suppression mode when the salient stimuli elicit users' negative evaluations*.

The transition from the controlled salience suppression mode to the automatic salience suppression mode requires that the banner suppression behavior be repeated for an adequate number of times within a relatively stable context (Schneider & Chein, 2003). A learned automatic behavior requires a long-term learning period, during which the connections between the different information processing stages become stronger and the processing speed becomes faster. Initially users may need to actively suppress their attention to banners, while after frequent repetitions, much less active control is needed and the suppression behavior eventually becomes automatic. However, the automatic suppression behavior cannot be achieved if the behavioral context changes. For example, the automatic suppression behavior cannot be achieved if a banner that was consistently located at the top part of a webpage is relocated to the bottom. The introduction of such an unstable context will impede the development of any consistent suppression behavior (Schneider & Chein, 2003). Thus, only when these two conditions - frequent repetitions and a consistent context - are both satisfied can the transition from a controlled process to an automatic process be achieved. Thus, we propose that:

Proposition 3: *Banner processing will change from the controlled salience suppression mode to the automatic salience suppression mode when the banner suppression behavior is repeated for an adequate number of times within a relatively stable context.*

The entire evolutionary process is similar to habituation, which is defined as "a behavioral response decrement that results from repeated stimulation" (Rankin et al., 2009, p. 136). Habituation can also be described by using a variety of other terms such as "adaptation, accommodation, fatigue, inhibition, negative learning, extinction, stimulus satiation, etc" (Thompson & Spencer, 1966, p. 17). Generally, it describes a form of learning that allows humans to filter out irrelevant stimuli and focus on important ones (Rankin et al., 2009). Regarding the similarity between the mode shifting process and the habituation process (Portnoy & Marchionini, 2010), we have adopted the term "habituation process" that appears in Figure 3 to describe how various banner processing modes change from automatic salience capture to automatic salience suppression.

4. A Unified Variance Model of Banner Processing

Based on the preceding arguments, it becomes clear that the debate between the distinctiveness and the blindness views of banner processing relies on whether the structural salience leads to more attention. The distinctiveness view purports that there is a positive relationship between structural salience and attention, while the blindness view does not. To provide a unified variance model to solve the debate, the somewhat limited view of the relationship between structural salience and attention should be challenged. There are two ways to achieve this objective. First, we may need to consider several contextual factors that could define the boundary conditions of the distinctiveness view versus the blindness view to consider. Second, several other important factors that have been overlooked when the evolution of the banner processing mode was being considered may exist. Regarding the first possibility, we include two contextual factors – habituation level and task type – as the moderators of the relationship between structural salience and attention. Regarding the second possibility, we include semantic salience as another important source of banner processing behavior because it can contribute to the modification of a goal-directed schema and redirect attention from a longitudinal perspective. Besides, we also propose using a variety of instruments to measure attention including the response time (Burke et al., 2005; Hong et al., 2004; Zhang, 2000), recognition, recall (Bayles, 2002; Hong et al., 2004; Pagendarm & Schaumburg, 2001), eye tracking, and physiological arousal (Burke et al., 2005).

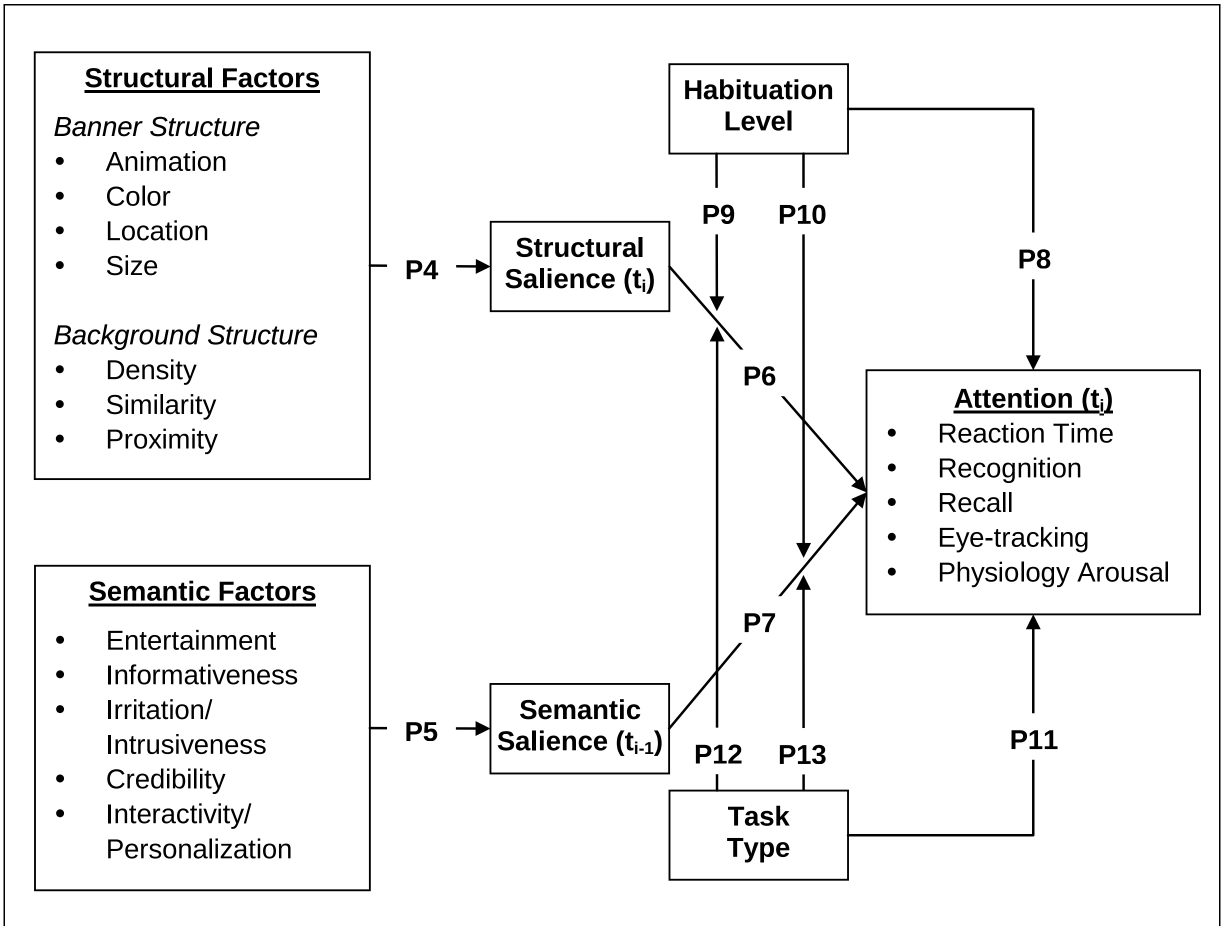

Figure 4. Banner Processing: A Variance Model

4.1. Structural Salience

We define structural salience here as the extent to which banners are salient with respect to their structural features. We can regard structural salience as an aggregated evaluation of the saliency of a package of structural features. These structural features can generally be classified into two types: the structural features of the banner itself and of those related to the background structure, which describes the relationship between the banner itself and its background.

The most frequently cited features of banner structure include animation (Bayles, 2002; Hong et al., 2004; Zhang, 2000), color (Lohtia, Donthu, & Hershberger, 2003; Moore, Stammerjohan,& Coulter, 2005; Zhang, 2000), location (Benway & Lane, 1998; Calisir & Karaali, 2008; Ryu, Lim, Tan, & Han, 2007; Zhang, 2001), and size (Cho, 2003; Li & Bukovac, 1999). Specifically, banners with animation are more salient compared to those banners designed with static image or text (Bayles, 2002; Hong et al., 2004; Zhang, 2000); bright colors are more salient than dark colors (Lohtia et al., 2003; Moore et al., 2005; Zhang, 2000); banners located at the top or to the left of a section are more salient (Benway & Lane, 1998; Calisir & Karaali, 2008; Ryu et al., 2007; Zhang, 2001); and larger banners are considered to be more salient than smaller banners (Cho, 2003; Li & Bukovac, 1999).

The structural features related to the background structure include: density of background (Hong et al., 2004); similarity between the banner itself and the target stimuli (Zhang, 2000), and the proximity of the banners to the target stimuli (Zhang, 2000). Density of background describes the number of other stimuli per unit of visual area – the larger the number of stimuli, the higher the density. When the density of the background is high, the structural salience of the banner is low because the other stimuli in the background are also competing for the limited cognitive resources, which makes the target banner less salient (Lavie, 1998; Lavie, Hirst, de Fockert, & Viding, 2004). The similarity between the banners and their target stimuli captures the extent to which the banner is similar to other stimuli in shape while, the proximity of the banners to their target stimuli refers to the distance between the banner and the other stimuli (Zhang, 2000). Researchers have found that, when both the levels of similarity and the proximity of a banner to other stimuli are high, the saliency of the banner decreases because the amount of cognitive effort required to distinguish between the banner and the other stimuli is large (Lavie, 1998; Lavie et al., 2004). Thus, we propose that:

Proposition 4: *The structural salience of a banner is positively associated with a) animation, b) color brightness, c) location prominency, and d) size. But is negatively associated with e) density of background, f) similarity, and g) proximity of the banner to other stimuli.*

4.2. Semantic Salience

We propose semantic salience as a concept that parallels structural salience. Semantic salience is used to capture the extent to which banners are salient in their semantic features. A semantic feature is considered salient when it is more likely to lead to a positive attitude and to approach behavior (e.g., people will pay attention to and read the content of banners).

To understand the semantic salience issues, we draw on the advertising value model (Ducoffe, 1996). In his seminal model, Ducoffe (1996) proposes that advertising value and attitude can be assessed from three dimensions: informativeness, entertainment value, and irritation or intrusiveness (Edwards et al., 2002). Informativeness refers to the ability of an ad to inform consumers about product alternatives, and stresses the cognitive evaluation aspect. Entertainment value lies in an ad's ability to fulfill an audience's needs for escapism, diversion, aesthetic enjoyment (or emotional release), and stresses the emotional evaluation aspect. Irritation reflects consumers' criticism of the advertising medium. It relates to the consumers' experience of annoyance, irritation, and/or offensiveness. Follow-up studies have proposed that advertising value and attitude can be further assessed from other dimensions. Brackett and Carr (2001) and Tsang, Ho, and Liang (2004) add the dimension of credibility, which depicts the extent to which advertising is believable and trustworthy; Wang, Zhang, Choi, and Daeredita (2002) and Zhang and Wang (2005) propose that there is an element of interactivity, which describes the extent to which users have control over web ads as being the fifth dimension. Similarly, the interactivity dimension is also operationalized as personalization in Xu, Liao, and Li (2008).

According to the advertising value model and its derivative, these dimensions can together form the overall perception of the semantic salience of banners. Thus, we propose that:

Proposition 5: *The semantic salience of a banner is positively associated with a) informativeness, b) entertainment value, c) credibility, and d) interactivity or personalization, but is negatively associated with e) irritation or intrusiveness.*

4.3. Attention

As discussed previously, according to the attention theory, attention is determined by both the stimulus-driven and the goal-directed schemata (Yantis, 1998). The stimulus-driven schema suggests that banners attract people's attention automatically according to their structural features, while the goal-directed schema implies that people actively control their attention allocation according to their goals, which are associated with semantic features. Therefore, we can regard as the result of a combination of structural and semantic processing. As mentioned before, we propose using both structural salience and semantic salience to capture the structural and semantic processing results, respectively. Following this, we can propose that stimuli with a high structural salience can attract more attention via a stimulus-driven mechanism. On the other hand, stimuli with a high semantic salience can attract more attention via the goal-directed mechanism.

However, the effects of structural and semantic salience on attention occur at different stages. As explained previously, according to information processing theory, structural processing precedes semantic processing. Thus, the output of semantic processing cannot possibly influence the structural processing that takes place in the same information processing activity (Tam & Ho, 2005). However, the semantic processing can influence subsequent structural processing by modifying the goal-directed schema. Therefore, the effect of structural salience on attention can be immediately reflected at the same point in time, while the impact of semantic salience on attention can only be exerted at the next time point. Thus, we propose that:

Proposition 6: *When users perceive the high structural salience of banners at t_i, the banners will attract more attention at t_i.*

Proposition 7: *When users perceive the high semantic salience of banners at t_{i-1}, the banners will attract more attention at t_i.*

4.4. Habituation Level

We can use habituation to explain the evolutionary process of banner processing where the salient banners have gradually been automatically suppressed due to repeated suppression behavior. Therefore, in the variance model, we take the habituation level as being a continuous variable that is used to capture the extent to which the suppression of banner ads becomes natural and automatic. For the automatic salience capture mode, there is no banner suppression, which suggests a low level of habituation; for the controlled salience suppression mode, users begin to suppress the banner ads but the suppression behavior is still not fully automatic, which suggests that there is a moderate level of habituation; and, for the automatic salience suppression mode, the banner ads' suppression has become automatic, which suggests a high level of habituation.

By definition, when the level of habituation is high, banner suppression becomes automatic. Thus, the time required for users to suppress banners once they observe them is very short (they may not even recognize them at all), so the cognitive capacity allocated to the banner ads is very low. In this case, banner ads are not well processed, which leads to a low level of attention being allocated to them (Portnoy & Marchionini, 2010). Thus, we propose that:

Proposition 8: *When the users' habituation level is high, the amount of attention being paid to banners will be low.*

More importantly, the habituation level can moderate the effects of structural salience and semantic salience on the amount of attention paid. Because different habituation levels suggest that a different schema is in use, the strength of the structural and semantic processing, which is defined by the schema, may change. Thus, structural salience may play a more important role when a stimulus-driven schema dominates the entire schema, while semantic salience plays the central role when a goal-directed schema dominates the entire schema

Specifically, when the users' habituation level is low, users process banners in an automatic salience capture mode; that is. salient stimuli automatically attract users' attention (Hong et al., 2007). In these situations, the stimulus-driven schema dominates the entire schema, which leads to the structural salience having a significant effect on attention. When users have a moderate level of habituation, they process banners in a controlled salience suppression mode. The strength of a goal-directed schema increases while the strength of a stimulus-driven schema decreases. Thus, the relationship between the structural salience and the amount of attention paid weakens. This is particularly true when the habituation level is very high, and users automatically suppress banners. In these cases, the salient banners are excluded from the users' visual scope. As a result, those non-salient banners receive more attention than do the salient ones, which suggests that there is a negative relationship between structural salience and the amount of attention being paid. Here, the stimulus-driven schema dominates the entire schema, which leads to a significantly negative relationship between structural salience and the amount of attention paid. Thus, we propose that:

Proposition 9: *The relationship between structural salience and attention is contingent on habituation level such that when the habituation level is low, banners with a high level of structural salience will attract more attention, while when the habituation level is high, banners with high structural salience will attract equal or less attention.*

Accordingly, with a low habituation level, the relationship between semantic salience and attention is not significant because the stimulus-driven schema dominates the entire schema. Following an increase in the habituation level, the strength of the goal-directed mechanism increases, which suggests that the relationship between semantic salience and attention also increases. However, when the habituation level is very high, the entire schema is again dominated by the stimulus-driven schema. In this situation, users can automatically suppress the impact of banners, which leads to a weak relationship between semantic salience and the amount of attention being paid. Thus, we propose that:

Proposition 10: *The relationship between semantic salience and attention is moderated by habituation level in an inverted-U shaped pattern, such that, at a moderate habituation level, semantic salience has a larger impact on the amount of attention being paid compared to situations characterized by either a low or a high habituation level.*

4.5. Task Type

While the habituation level affects the schema structure through a repeated learning process, task type may affect the schema structure according to specific task requirements. Previous research has suggested that there is a dichotomous typology of tasks: searching task and browsing task (Novak, Hoffman, & Duhachek, 2003; Tam & Ho, 2006).

Task type can influence the amount of attention paid by activating different information processing schema. When users search for information, the goal-directed schema may encourage users to pay attention to those areas in which they anticipate finding the relevant information, and may prevent them from being distracted by irrelevant information (Pagendarm & Schaumburg, 2001). This goal-directed schema causes banners (which are often irrelevant to the searching task) to receive less attention. In contrast, when users simply browse webpages (without a specific a goal), stimuli on the webpages can attract users' attention automatically (Yantis, 1998). In this situation, banners, which usually are designed with salient features, are more likely to attract users' attention (Pagendarm & Schaumburg, 2001). Thus, we propose that:

Proposition 11: *Generally speaking, banners can attract more attention during browsing tasks than during searching tasks.*

Because different types of tasks can activate different banner processing schemata, the impact strengths of structural and semantic salience on attention should be different for different types of tasks. With respect to structural salience, when the stimulus-driven schema dominates information processing, humans' cognitive resources are freely allocated to all stimuli and those with salient structural features can gain more attention. In contrast, when the goal-directed schema dominates the information processing, humans' cognitive resources are allocated in terms of their goals. Hence, stimuli with salient structural features may not necessarily receive more attention. With respect to semantic salience, because the goal is most frequently defined by semantic features, stimuli with the most salient semantic features can receive more attention under the goal-directed schema than under the stimulus-driven schema. Furthermore, given that a searching task can activate a goal-directed schema while a browsing task can activate a stimulus-driven schema, we expect that: 1) the relationship between structural salience and attention will be stronger for the browsing tasks than for the searching tasks, and 2) the relationship between semantic salience and attention will be stronger for the searching task than for the browsing task. Thus, we propose that:

Proposition 12: *The influence of structural salience on the amount of attention paid is stronger in browsing tasks than in searching tasks*.

Proposition 13: *The influence of semantic salience on the amount of attention paid is stronger in searching tasks than in browsing tasks.*

5. Habituation

In theorizing about the unified model of banner processing, we need to understand how habituation takes place and which specific factors affect it.

Habituation is a process through which banner-suppression behavior becomes an automatic process. Since banner processing goes through two major stages – structural processing and semantic processing – the automaticity of banner processing requires the automaticity of every sub-process. Thus, we need to understand how the two sub-processes of banner processing become automatic.

According to the dual processing theory, achieving an automatic process requires long-term learning with an adequate level of behavioral frequency in a relatively stable context (Schneider & Chein, 2003). If the context changes from one situation to another, users must occasionally change their response patterns. In these situations, a schema that can be generalized to a variety of behaviors cannot be formed. Besides, behavioral frequency can strengthen the power of the schema and increase the speed of information processing. When the behavioral frequency exceeds a cerain threshold, the site users will process banners in an unconscious way (i.e., the process will become automatic).

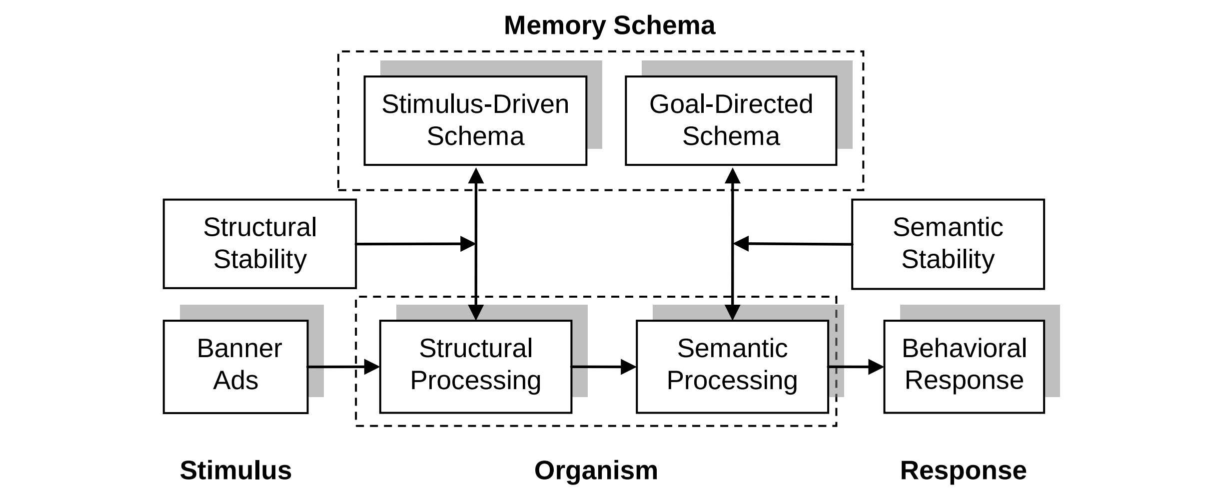

Figure 5. Structural and Semantic Stability

We can evaluate context stability through the level of consistency that exists between the expectation derived from the schema and the actual situation in a specific processing activity (see Figure 5 above). For example, when users expect that there will be a rectangle at the top of a webpage according, and they actually see the rectangle as expected, they will perceive the structural context as being stable. Similarly, when users expect that the rectangle at the top of a webpage is an annoying ad, and they actually discover that this is indeed true, they will regard the semantic context as being stable. According to the dual processing theory, we predict that, when Website users perceive the context as being stable, those users will base their information processing on existing schema (Lim et al., 1996; Logan, 1988; Logan, 1992). Taking habituation as the result of the automaticity of both structural and semantic processing, we propose in Figure 6 that:

***Proposition 14**: Structural stability is positively associated with habituation level.*

***Proposition 15**: Semantic stability is positively associated with habituation level.*

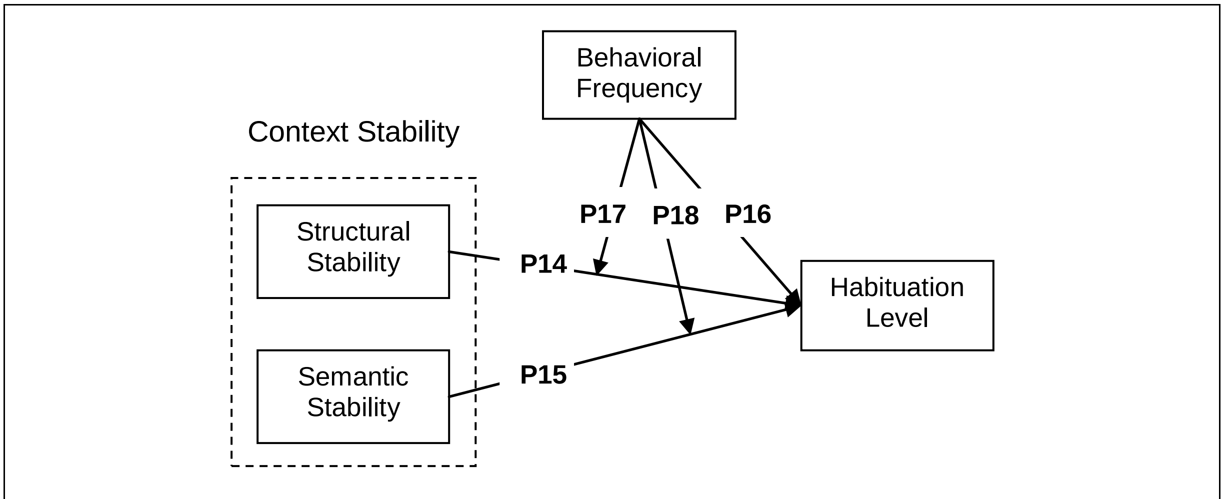

Figure 6. Factors Influencing Habituation

However, the dual processing theory also suggests that contextual stability is a necessary but insufficient condition. Although contextual stability can make future situations predictable, users still may not be able to consciously control their behavior. For example, users may intend to suppress their recognition of banners, but they cannot totally filter out the distraction of banners (Hong et al., 2004; Zhang, 2000). Thus, behavioral frequency is another important factor for the formation of habituation. In this study, we propose two roles of behavioral frequency. First, given the same structural and/or semantic stability, when the frequency of banner suppression increases, the processing (e.g., the avoiding of the banners) speed can also increase (Schneider & Chein, 2003), which leads to a high habituation level. This reaction illustrates the main effect of behavioral frequency. Second, behavioral frequency can also determine the effect of contextual stability; that is, its moderating role. Specifically, even although the level of structural and/or semantic stability is high, if the frequency of banner suppression behavior is low, users may still not have sufficient ability to leverage the context stability and to respond quickly. This inability suggests that behavioral frequency can enhance the impacts of contextual stability on habituation level. Thus, we propose that:

***Proposition 16**: Behavioral frequency is positively associated with habituation level.*

***Proposition 17**: Behavioral frequency positively moderates the relationship between structural stability and habituation level.*

***Proposition 18**: Behavioral frequency positively moderates the relationship between semantic stability and habituation level.*

6. Empirical Strategies to Test the Research Framework

The proposed research framework offers a guideline for achieving a comprehensive understanding of banner blindness. However, the research framework and the propositions derived from it still require empirical validation. To bridge the gap between the conceptual framework and the empirical testing, we here provide several methodological strategies that can be applied in future empirical studies.

Generally, previous studies use two methods to investigate banner advertising: the laboratory experiment and the survey. These two methods have their respective advantages and disadvantages. With laboratory experiments, researchers can accurately manipulate the structural factors and measure the resulting attention levels using objective data such as response time. On the other hand, using the survey method, researchers can capture such psychological factors as the levels of informativeness and entertainment value and leveraging the real world as the research context. More recent studies, on the other hand, tend to combine the experiment and survey methods to leverage their respective advantages. Similarly, to test our research framework, an integrative method that includes both the experiment and the survey methods should be used.

A multi-stage experiment with a survey can be used to test the proposed unified model of banner processing. A multi-stage experiment has the advantage of capturing how users' behavior evolves along with time. There are three key issues to address when conducting a multi-stage experiment. First, we can leverage prior manipulations of the structural factors (Hong et al., 2007; Zhang, 2000), the semantic factors (Edwards et al., 2002; McCoy et al., 2007; Zhang & Wang, 2005) and the task type (Hong et al., 2007; Pagendarm & Schaumburg, 2001) as elements in the study. Second, the experiment can be repeated many times. After each trial, we can collect data about users' attention spans and beliefs using objective measures or questionnaires. Third, we need to provide an approach to manipulate or measure habituation levels (see the following discussion). The first two issues are easier to address by referring to previous studies; the greatest challenge in examining our research framework is how to manipulate and/or measure the users' habituation levels.

In line with this design strategy, we suggest that it would be useful to manipulate the users' habituation levels through a series of repeated tasks, which can generate a learning effect (Hong et al., 2004). To attain a variance in habituation levels, we consider the habituation model shown in Figure 6 to suitably act as a guideline for the experiment design. According to this model, structural stability, semantic stability, and behavioral frequency determine habituation. Hence, different habituation levels can be achieved by manipulating these three factors. Table 2 illustrates an example of such an experimental. In this example, only one structural feature (e.g., location) and one semantic feature (e.g., informativeness) are considered in order to simplify the discussion. Specifically, structural stability and semantic stability are taken as being between-group factors; that is, subjects are divided into different groups according to the stability levels. For the high structural or semantic stability situation, the structural or semantic features remain consistent between different trials. While in the low structural or semantic situations, the structural or semantic features are inconsistent between different trials. Behavioral frequency is treated as a within-group factor; that is, a subject's initial task participation is taken as being infrequent behavior whereas their later task participation is taken as frequent behavior.

Table 2. Habituation: Manipulations and Measures

Manipulations	Structural stability (e.g., location)	**A between-group factor** Stable group: banners are always located in the top position for all tasks. Unstable group: banners are located in the top position for one task, but are located in the bottom position for another task.
	Semantic stability (e.g., informativeness)	**A between-group factor** Stable group: the contents of banners are always irrelevant to the primary task for all tasks. Unstable group: the contents of banners are sometimes irrelevant but at other times are relevant to the primary task.
	Behavioral frequency	**A within-group factor** A subject's initial task participation is infrequent whereas their later task participation is frequent.
Measures	Structural stability	Sample item: Banner ads on the webpages are always located in the same position.
	Semantic stability	Sample item: Banner ads on the webpages are not informative.
	Behavioral frequency	Sample item: "I have considerable experience in avoiding banner ads".

There are two ways to measure habituation levels in a survey. The first approach uses other variables as the proxy of habituation. For example, experience is related to time and can reflect the learning effect. Therefore, it can act a possible proxy for habituation (Hong et al., 2007). In the second approach, habituation is measured from three dimensions (e.g., structural stability, semantic stability, and behavioral frequency), which is similar to the other experimental manipulations. One of the advantages of using survey instruments is that constructs, which consist of multi-dimensions, can be better captured and measured. Therefore, in this study context, structural stability and semantic stability can be measured using formative first-order constructs or formative second-order constructs to address the key structural and semantic features of banners. In Table 2, we list several sample items that are used to measure these factors. However, a reliable and validated instrument requires a rigorous filtering and refining process (Moore & Benbasat, 1991). Here, we attempt to provide an example on how to measure habituation levels. Future research still has to design the exact instrument for measuring habituation levels.

Although a multi-stage experiment conducted with a survey provides one way to capture the evolutionary process and learning effect, it suffers from several shortcomings. The major concern is that subjects may remember the questions in the first trial and answer the same questions in the subsequent trials with bias. This response shading should be regarded as a limitation of this method. There are several other cautions that need to be exercised when using this method. First, the number of questions should be kept relatively low. Second, the number of trials should also be kept relatively low. Third, to further improve this method, the subjective questions that are used to measure structural stability, semantic stability and behavioral frequency, and the objective measures reflecting the cognitive changes should also be considered. However, the selection of objective measures would need additional effort and may not be easy to identify.

Another alternative method to test our research model is to employ a non-intrusive field design. With a non-intrusive field design, the users' banner processing behaviors can be captured in a more realistic context. Further, because the data are collected from the users' actual behavior in a natural setting, no treatment is imposed on the subjects, which reduces the potential for bias being induced by the study design. To conduct such field studies, researchers need to gain access to real websites. The variance in structural factors and semantic factors can be obtained across different websites with different banners. To evaluate the structural and semantic salience of different banners, researchers can first recruit several users to assess the design of these banners and select those banners about which there is a high level of agreement among the different raters regarding the focus stimuli. Then, the researchers can trace the responses of users who browse the webpages on which these banners are located, and then they can record the users' visit frequency and their click-through behaviors. They can then assess the structural stability and semantic stability by the change in the click rate of the webpages and banners. Through this method, all constructs used in the proposed research framework can be accurately coded and measured using objective data.

Nonetheless, the empirical strategies illustrated here, which includes the multi-stage experiment and the non-intrusive field design, only serve as general principles and guidelines, a more detailed research design instrument will need to be more carefully crafted to obtain more accurate study results.

7. Contributions and Future Research

This conceptual work has several theoretical and practical implications. First, this study reconciles the distinctiveness view versus the banner blindness view debate by providing an evolutionary view of banner processing. Prior studies have produced two contradictory explanations for the effectiveness of banners: some researchers feel that salient features should obviously attract users' attention (Hong et al., 2004; Zhang, 2000), but others have observed that it is not only these salient features that attract the users' attention because sometimes these salient features may be more easily missed than their non-salient counterparts (Benway & Lane, 1998). Both of these two views may explain only one polar of the continum of banner processing (see Figure 3). In this study, recognizing that users can learn from their past behavior in order to adjust their banner processing schema, we propose that, from an evolutionary perspective, banner processing can be understood through the application of a three-stage model: automatic salience capture, controlled salience suppression, and automatic salience suppression. The evolutionary view is consistent with the distinctiveness view at the automatic salience capture stage and is consistent with the banner blindness view at the controlled and automatic salience suppression stages. This conceptualization reveals that the distinctiveness view and the banner blindness view are not inherently conflicting. The seeming contradiction between them is due to the fact that their boundary conditions are not sufficiently well defined.

Second, this study develops a comprehensive research framework, which researchers can use to gain an understanding of the factors that affect user attention by considering the interaction between banner features (e.g., structural and semantic) and the processing schema, which can in turn be affected by habituation level and task type. From this human/computer interaction perspective, we argue that whether or not structural salience and semantic salience can influence user attention depends on the schema in use. Structural salience plays an important role when a stimulus-driven schema is in use (e.g., both at low and high levels of habituation when users are performing a browsing task) while semantic salience is effective only when a goal-directed schema is in use (e.g., at a moderate habituation level when the user is performing a searching task). Through this theorization, we are able to not only identify the context in which the structural features determine the level of attention, but also clarify how the semantic features can affect the amount of attention paid from a longitudinal perspective. Taking into consideration all of these variables enriches our theoretical understanding of the distinctiveness view and the blindness view, and further advances the body of existing literature about users' banner processing by providing a unified model.

Third, this study sheds light on how habituation occurs and what factors determine users' habituation levels. We emphasize the factors influencing habituation levels due to its importance in solving the distinctiveness – blindness debate. After thoroughly examining the information processing model, we propose that the automaticity of banner suppression relies on the automaticity of two sub-processes, which are respectively determined by structural stability and semantic stability. Thus, in going beyond the results of previous studies and focusing on the situational effects of a variety of factors, we propose the use of a dynamic model that considers the stability of banner features. This conceptualization is consistent with the evolutionary view of banner processing. It also implies that, when investigating banner advertising in a real-world setting, except for the structural and semantic features of banners, the effect of habituation should be carefully considered.

Based on our study, much work should be done in future research. First, empirically validating the proposed research framework and propositions is necessary. When conducting empirical studies, researchers should pay special attention to the experiment design and to instrument development. Although the empirical strategies outlined in this paper can be regarded as a basis for a methodological design, more design details should be crafted and included. Second, although this study reveals the impact of the habituation process through which the banner processing mode evolves from automatic salience capture to automatic salience suppression, practitioners such as web advertisers and ad sponsors may be more interested in the reverse process. Specifically, they should pay more attention to how to eliminate banner blindness and attract people's attention through more effective banner design. To achieve this goal, a dishabituation process (the reverse process of habituation), which describes the re-activation of such processing behaviors as salience capture, should be considered (Rankin et al., 2009). This goal can be achieved by redesigning the structural and semantic features of banners to eliminate the automatic salience suppression mode. This step would transform the users' stimulus processing from the automatic salience suppression mode to the controlled salience suppression mode and may even progress to the automatic salience capture mode. Our study can be treated as a basis for the research necessary for examining this reverse process.

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