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Effects of Motivational Activation on Processing Positive and Negative Content in Internet Advertisements

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Abstract

This study investigated the impact of individual differences in motivational reactivity on cognitive effort, memory strength (sensitivity) and decision making (criterion bias) in response to Internet ads with positive and negative content. Individual variation in trait motivational activation was measured using the Motivational Activation Measurement developed by A. Lang and her colleagues (A. Lang, Bradley, Sparks, & Lee, 2007). MAM indexes an individual's tendency to approach pleasant stimuli (ASA, Appetitive System Activation) and avoid unpleasant stimuli (DSA, Defensive System Activation). Results showed that individuals higher in ASA exert more cognitive effort during positive ads than individuals lower in ASA. Individuals higher in DSA exert more cognitive effort during negative ads compared to individuals lower in DSA. ASA did not predict recognition memory. However, individuals higher in DSA recognized ads better than those lower in DSA. The criterion bias data revealed participants higher in ASA had more conservative decision criterion, compared to participants lower in ASA. Individuals higher in DSA also showed more conservative decision criterion compared to individuals lower in DSA. The theoretical and practical implications are discussed.

Keywords: Motivational Activation Measurement, Internet advertisement, STRT, signal detection.

1. Introduction

This study investigated whether an individual's trait levels of appetitive (approach) and aversive (avoid) motivational reactivity influence cognitive effort while viewing Internet advertisements. In addition, this study examines whether this varies as a function of the emotional valence (pleasant/unpleasant) of the advertisement content. This study is based, conceptually, on Cacioppo's dual system theory of motivation (Cacioppo & Gardner, 1999), dimensional emotion theory (P. J. Lang, Bradley, & Cuthbert, 1997) and A. Lang's limited capacity model of motivated message viewing (A. Lang, 2006a; 2006b). The dimensional approach to emotion argues that

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emotion can be defined as a function of two primary dimensions - valence (pleasant/unpleasant) and arousal. Caccioppo's dual system theory posits that the appetitive and aversive systems are independent of one another and are the functional foundation for producing the positive (or pleasant) and negative (or unpleasant) emotional experiences. A. Lang and others have suggested that the activation levels of the motivational systems vary across individuals and that these individual differences predict variation in cognitive, physiological, and emotional responses to some mediated messages such as still pictures (A. Lang, Shin, & Lee, 2005), TV PSAs (A. Lang, Chung, Lee, Schwartz, & Shin, 2005), entertainment video clips (Shin, 2006), and video games (Park, 2006). This study begins to investigate how motivational activation influences the processing of Internet (World Wide Web) advertising.

Given the increasing desire to customize advertising messages to target audiences, this study explores how web users who vary on motivational activation respond differently to Internet ads containing pleasant or unpleasant emotional content created by combination of emotional pictures and brief explanatory advertising captions. In particular, this study focuses on the relationship between trait levels of motivational reactivity and cognitive effort to, and encoding of web based stimuli, indexed by viewing time, secondary task reaction time, recognition strength and decision making.

2. LC4MP and Motivational Activation

With the Web advertising industry concentrating on the quality of the content associated with the target audience, creating targeted ads appealing to the potential consumers would be a critical goal for the Internet ads (Lerner, 2005). Some of the Internet advertisement programs track a user's web-surfing history and present relevant ads at proper moments (Olsen, 2003). The Internet ads attempt to take consumers' personal traits into consideration to find a more narrowly targeted audience (Lerner, 2005). Elaborating on this trend, this study investigates how emotion-evoking content in the Internet ads and individual motivational disposition affect information processing (e.g. attention and memory) in viewers with adopting a theoretical framework.

The Limited Capacity Model of Motivated Mediated Message Processing (LC4MP) includes motivational activation as a fundamental factor of mediated message processing (A. Lang, 2006a; 2006b). According to LC4MP, mediated messages containing motivationally relevant content activate the appetitive and/or aversive system. The functional difference of the appetitive and aversive system is explained with two concepts, *negativity bias* and *positivity offset* (Cacioppo & Gardner, 1999; Ito, Cacioppo, & P. J. Lang, 1998). The negativity bias indicates more intense and faster responses to negative objects than to positive objects (A. Lang, 2006a). The negativity bias enables quick withdrawal from danger. In a relatively neutral environment, human beings are thought to be slightly more appetitively than aversively activated, and this difference in activation in a neutral environment is called positivity offset. Positivity offset is theorized to enable the organism to explore new environments.

The LC4MP provides the Motivational Activation Measurement (MAM), which is designed to be an indicator of individual differences in trait motivational reactivity (A. Lang, Shin, & Lee, 2005). Several studies have been undertaken to assess the validity of MAM as a measure of individual differences in motivational reactivity/activation (A. Lang, Bradley, Sparks, & Lee, 2007). MAM produces a measure of appetitive system activation called ASA which has been shown to be positively related to other indicators of appetitive activation (such as increased attention to stimuli, exploratory behavior, positive emotion) and with other variables that are related to high appetitive activation (e.g. sensation seeking). Results of the validation studies to date have shown that ASA is related to increased cognitive effort when viewing both positive and negative pictures, longer time spent looking at picture stimuli especially when they are arousing, greater activation in the zygomatic (smiling) muscle group, smaller startle responses indicative of less aversive and more appetitive activation respectively (A. Lang et al., 2007; A. Lang, Shin & Lee, 2005).

3. Motivational Activation and responses to Internet ads

Considering the aforementioned statements, individuals with a higher ASA may pay more attention to both positive and negative pop-up ads than those with a lower ASA. The secondary task reaction time (STRT) is used as an indicator of available resources. The STRT measures how fast the subjects respond to a secondary task (audio signal) while performing a primary task (viewing ads). The LC4MP suggests that the STRT measures the level of available resources during media use (A. Lang, Bradley, Park, Shin, & Chung, 2006). Available resources are defined as resources which have been allocated to the media viewing task but are not required to do the task. Resources required to encode a media message is related to message variables such as complexity and information density and individual variables such as familiarity and expertise. Resources allocated to the task is related to cognitive effort (how hard the user is trying to encode the material) and the presence of structural and content features which elicit the automatic allocation of resources to encoding. When many more resources are allocated to the task than are required there are ample available resources and STRTs are fast (and task performance − indexed by recognition is good). When barely enough resources are allocated to a task, there are few available resources, and STRTs are slow (though task performance remains good). When there are insufficient resources allocated, and available resources are negative, STRTs are again fast but in this case task performance is poor (A. Lang et al., 2006).

In this study, the appearance of the Internet ad with pop-up style is thought to elicit an orienting response and thereby the automatic allocation of resources to encoding. Because taking in information is a primary cognitive task associated with approach behavior it is theorized that individuals higher in ASA, and therefore more approach oriented, generally allocate more resources to encoding than do individuals who are lower in ASA. Therefore, those higher in ASA should allocate more resources to the same task than those lower in ASA. Since resources required are the same for both groups (because it is the same task) those higher in ASA should have more available resources and therefore have faster STRTs compared to those lower in ASA.

In addition to allocating more resources to the pictures it is also that in general, those high in ASA are more interested in motivationally relevant stimuli compared to those lower in ASA. Previous studies have operationalized this greater interest, or increased cognitive effort, as time spent looking at stimuli. Thus, it is predicted that:

H1: Individuals higher in ASA will exhibit faster STRTs and spend more time looking compared to those lower in ASA when exposed to both positive and negative Internet ads.

Aversive activation is associated with protection of the organism (Ito, Cacioppo, & P. J. Lang, 1998; A. Lang, 2006a; 2006b). Thus, the MAM measure of defensive system activation (DSA) should be and is related to indicators of aversive activation. The validation studies have shown that increased DSA is related to less time spent looking at arousing (but not calm) negative pictures, increased startle responses, accelerations in heart rate indicative of avoidance behavior (A. Lang et al., 2007; A. Lang et al., 2005). Of interest here is the finding that cognitive effort or interest in a negative stimulus is moderated by the arousing content level of the stimulus. LC4MP argues that this is related to the behavioral responses to negative stimuli.

During appetitive activation, increases in arousal should be quite linearly related to increases in resources allocated to external stimuli because one continues to attend to positive opportunity stimuli (food, sex, money, etc.) as you approach them. During aversive activation, on the other hand, as the negative stimulus becomes more arousing the behavioral response to it changes. Initially, when confronted with a negative but low to moderate intensity stimulus, people attend to rather than avoid it (P. J. Lang, Bradley, & Cuthbert, 1997). This process can be explained in terms of adaptation. When an organism detects a potentially dangerous object, the organism needs to figure out how dangerous it is and

what to do. This requires allocation of cognitive resources to encoding and identifying the stimulus. As arousal (proximity to harm/threat) increases the organism's needs to protect itself and hence readies itself for fight/flight. For this reason, it is logical that at low to moderate levels of negative stimuli allocation of resources to encoding increases. However, at high levels of arousing content, resources will be shifted from encoding to decision making about how to avoid the negative stimulus. It is reasonable to expect that those higher in DSA will allocate more resources to encoding (and thus have faster STRTs) at low and moderate levels of arousing content and fewer resources to encoding (and have slower STRTs) at high levels of arousal compared to those lower in DSA. Because the pictures used in this study are of low moderate to moderate levels of arousing content it is expected that those higher in DSA will allocate more resources compared to those lower in DSA, hence:

H2: Individuals higher in DSA will exhibit faster STRTs and longer viewing time than those lower in DSA while exposed to negative Internet ads of moderate intensity.

4. Motivational Activation and Signal Detection

Since ASA and DSA are expected to affect resources allocated to processing the ads, it follows that they should also influence memory processing, in particular stimulus encoding. In this study, encoding is assessed using recognition measures and signal detection analysis. To apply signal detection theory, recognition tests consist of old items (targets), which are introduced during the experiment, and new items (foils), which are not introduced (MacMillan & Creelman, 1991; Shapiro, 1994). Even though the familiarity of actual memories is usually higher than that of false memories, it is possible that some new items seem more familiar to viewers than some old items. Two measures are produced by the analysis, sensitivity (or dprime) indicative of memory strength is used to measure "how easily a person can distinguish between true memories and similar memories not relevant to the situation" (Shapiro & Fox, 2002, p.112) and criterion bias, which is the level of familiarity required before a person will respond yes (Shapiro & Fox, 2002). Criterion becomes more conservative (require a higher level of familiarity) when there are negative consequences for saying yes to a stimulus you did not see (a 'false alarm') and more liberal (require less familiarity) when there are negative consequences for failure to recognize a target (a 'miss').

At times signal detection methods can produce more sensitive measures of recognition than simply comparing the ratio of correct answers (Fox, 2004). If higher ASAs allocate more resources, as previously predicted, compared to lower ASAs they should have better recognition sensitivity for both positive and negative pop-up ads and the same should be true for those higher compared to lower in DSA for negative pop-up ads.

H3: Individuals higher in ASA will be more sensitive to both positive and negative Internet ads compared to those lower in ASA.

H4: Individuals higher in DSA will be more sensitive to negative Internet ads compared to those lower in DSA.

Though previous research on individual differences in the motivational system activation has not addressed this decision-making aspect of memory judgments, it can be conjectured that individuals higher in ASA may show a tendency to say "yes" because of their general tendency for being more likely to explore new environments and thus accept new things more easily. Based on the same line of reasoning, individuals higher in DSA may show more conservative decision making by saying "no" because they are afraid of the negative consequences following their response. Thus,

H5: Individuals higher in ASA will exhibit more liberal criterion bias for their recognition memory compared to those lower in ASA.

H6: Individuals higher in DSA will exhibit more conservative criterion bias for their recognition memory compared to those lower in DSA.

5. Method

5.1. Design

The design of the experiment was a mixed DSA (low, high)/ASA (low, high) X Advertisement Valence (unpleasant, pleasant) X Repetitions (8 pictures in each valence category) factorial design. ASA and DSA are between subjects factors and the levels were determined using a median split technique. Picture valence and repetitions are within subject factors. The presentation order was randomized for every participant in order to control order effects. Eight messages for each valence category represent the repetition factor generally used in a within subject design. All participants completed the Motivational Activation Measure (MAM), which consists of 90 images selected from the International Affective Picture System (IAPS) based on the emotional response norms (A. Lang et al., 2007). Participants rated the 90 pictures on three scales arousal, positivity, and negativity. These ratings are used to compute ASA and DSA (A. Lang et al., 2007; A. Lang, Shin & Lee, 2005).

5.2. Stimulus Material

A total of 16 news items and 16 pop up ads were used in the stimuli presentation. After a short practice session, a custom-made multimedia application presented 16 news items in a random order, displaying one randomly chosen ad for each news item. All ads are identical in size, format, and portion of the picture. The 16 pictures used for the pop-up ads is a subset of the 100 pictures used by Ito and Cacioppo (2005) which were filtered from the IAPS by removing unusual items (e.g., highly negative pictures with extremely low arousal ratings) − from these pictures, 8 positive (IAPS numbers; 4599, 4640, 5628, 8040, 8210, 8340, 8400, 8500) and 8 negative (IAPS numbers; 1111, 2053, 2710, 3051, 6300, 9181, 9500, 9920) pictures with a mid level arousal score were selected for use in this study (M =5.70). The pleasant pictures contained images of content of outdoor sports, bars of gold, and kissing, while negative pictures include a drug addict, a swarm of worms, and a crashed car. These images were different from those used in the MAM. An informative advertising text was created based on the content of the picture (e.g., picture of crashed car coupled with text encouraging safety belt use, picture of a drug addict coupled with text warning dangers of illegal drug use). The average length of the text in the ads is 33.0 words. The text had the same format: a title, a body with several sentences, and a name and URL of a fictitious sponsor's Website.

The created ads were tested for valence and arousal with different participants. Sixty three participants rated the ads for positivity, negativity, and arousal, all on a 9-point scale. For the positivity score, the main effect for Valence was significant (F (1, 62) = 316.54, p< .001). Participants rated positive messages as more positive (M = 5.68) than negative messages (M = 1.93). For the negativity score, the main effect for Valence was significant (F (1, 62) = 625.713, p < .001). Participants rated negative messages as more negative (M = 6.84) than positive messages (M = 2.28). There was no significant main effect of Valence on the arousal ratings (F <1), indicating that arousal level was successfully controlled. The mean score was 5.34 for the positive messages and 5.40 for the negative messages, respectively.

To avoid possible confounding from subjects reading news items on familiar subject or topics they already know about, news articles were collected from non-U.S. newspapers published in English, such as the *Guardian* (British) and the *Herald Sun* (Australian). Selected articles were edited to control the length. The average length of the news was 182.0 words. They were neutral and low arousing in content. After 5 seconds a news item is displayed, an ad appeared, covering a significant portion of the news text. See the appendix for an image of the mixture of the news articles and ads.

5.3. Dependent Variables

STRT. Looking at the ads is the primary task and responding to audio tones is the secondary task. The

subjects were instructed that their reaction to the audio tones should be as quick as possible. STRT audio probes were randomly assigned to half of the ads (four positive and four negative) from each valence category to avoid expectation effects. The STRT probe was an audio tone (1,000Hz, 250ms) which occurred 3 seconds after the onset.

Viewing Time. Viewing time was measured by the length of time from the ads appearance on screen until the participant clicked the 'close window' button located on the right top of the pop-up ad window.

Sensitivity and criterion bias. Participants viewed 32 IAPS pictures and responded yes or no that they had seen the images. Half (16) of the pictures were old items (or targets) and half were new (or foils). Memory sensitivity and criterion bias were calculated using equations suggested by Shapiro and Fox (2002). Memory sensitivity with larger *d'* (d-prime) value is an indication of memory strength and is better as *d'* gets larger. Criterion bias (denoted as *c*) gets more liberal as it gets smaller and more conservative as it gets larger.

5.4. Participants

One hundred twenty one students from a large Midwestern university in the United States participated in the experiment for class credit. Five subjects were excluded from data analyses because of the technical malfunctions (three subjects) and language barriers (two foreign students).

5.5. Procedure

Participants completed the experiment individually. On arrival, the participants were greeted and seated at a computer. Participants were told that they should act as they would if reading the on-line news at home. However, they were also informed that there would be a memory test about the content of whatever they have seen. After the practice session, participants were exposed to total of 16 pop-up ads, each embedded in a news article. Participants were told that from time to time they would hear a beep and when they did they should push the enter key as fast as possible. After viewing all the stories and ads they watched and rated a series of short video clips for memory distraction tasks, then completed the MAM measure. Finally the participant completed the visual recognition test and were thanked and dismissed.

6. Results

For data analyses, repeated measure ANOVAs were conducted in the form of DSA/ASA (low, high) X repetitions on the aimed data (positive, negative, or total) in each prediction. There was not any significant interaction between ASA/DSA and repetition. which rendered us to merge the repetition data. The descriptive data for the dependant variables are summarized in the table 1.

Table 1. Means and Standard Deviations of Dependant Variables

	Positive (M, SD)	Negative (M, SD)	Total (M, SD)
STRT	629.91ms (338.24)	642.44ms (350.40)	631.47ms (341.33)
Viewing Time	10.23s (4.91)	12.35s (5.70)	11.29s (5.08)
Recognition (Correct Ratio)	78% (28)	88% (21)	83% (24)

Hypothesis 1

These hypotheses predicted that individuals higher in ASA would show faster STRTs and spend more time looking at the images compared to those lower in ASA. For all ads, there was no significant main effect for ASA either on STRTs ($p = .13$) or on viewing time ($p = .30$). However, the effect of ASA for positive ads approached significance on STRTs (F (1, 113) = 2.88, $p = .09$, partial $\eta^2 = .03$) with those higher in ASA having faster STRTs ($M = 586.07$ms, $SD = 301.30$) compared to those lower in ASA ($M = 667.75$ms, $SD = 267.40$). The effect of ASA for positive ads also approached significance on viewing time (F (1, 111) = 2.88, $p = .08$, partial $\eta^2 = .03$) with those higher in ASA looking longer ($M = 10.78$s, $SD =$

4.78) than those lower in ASA (M = 9.06s, SD =5.52).

Hypothesis 2

This hypothesis predicted that individuals higher in DSA would show faster STRTs and view negative images longer than those lower in DSA. The main effect of DSA on STRTs was significant (F (1, 114) = 4.69, p = .03, partial η^2 = .06). As predicted, participants with higher DSA showed faster STRTs while viewing negative ads (M = 589.00ms, SD =202.21) than participants with lower DSA (M = 695.88ms, SD =284.81). The main effect of DSA on viewing time for negative ads was also significant (F (1, 110) = 3.35, p = .03, partial η^2 = .05). As predicted, participants with higher DSA viewed negative stimuli for a longer time (M = 13.21s, SD = 4.78) compared to participants with lower DSA (M = 11.09s, SD =4.82).

Hypothesis 3

This hypothesis predicted that individuals higher in ASA would have more sensitive memory for all ads compared to those lower in ASA. The main effect of ASA on sensitivity was not significant for total, pleasant, or unpleasant ads (F < 1).

Hypothesis 4

This hypothesis predicted that individuals higher in DSA would have more sensitive memory for negative ads compared to those lower in DSA. The effect for DSA on sensitivity was significant (F (1, 114) = 5.06, p = .02, partial η^2 = .06). As predicted, participants with higher DSA showed higher sensitivity (M = 2.45, SD =.97) compared to participants with lower DSA (M = 2.18, SD =.95).

Hypothesis 5

This hypothesis predicted that individuals higher in ASA would be more liberal with their recognition for ads compared to those lower in ASA. The main effect of ASA on criterion bias was approached significance (F (1, 114) = 3.02, p = .08, partial η^2 = .02). However, participants with higher ASA made more conservative decisions (M = .30, SD =.68) compared to participants with lower ASA (M = .19, SD =.75), which was the opposite direction to that predicted.

Hypothesis 6

This hypothesis predicted that individuals higher in DSA would be more conservative with their recognition for ads compared to those lower in DSA. There was a significant main effect of DSA on criterion bias for negative ads (F (1, 114) = 4.11, p = .04, partial η^2 = .05). As hypothesized, participants with higher DSA were more conservative in decision making (M = .16, SD =.70) compared to participants with lower DSA (M = .06, SD =.52).

7. Discussion

This study investigated how individual differences in motivational activation influenced STRTs, viewing time, memory strength (sensitivity), and decision making (criterion bias) in response to Internet advertisements with positive and negative content when the intensity (i.e. arousal) is controlled at moderate level. Results showed that aversive activation significantly increases attention to unpleasant ads (as indicated by slower STRTs and longer time spent looking at images) and memory (as indicated by greater memory strength and conservative decision making) for those images. However, contrary to predictions, in this environment and with these moderately arousing stimuli, ASA did not significantly influence either measure of attention (STRT and time spent looking) or memory (d prime and criterion bias). However, there was some slight evidence that those higher in ASA might pay a bit more attention to positive images.

Future research should use various types of images at different levels of arousal to investigate why variations in appetitive activation had so little influence on processing. One possibility is that the context (reading on-line news) is a safe environment and yet contains significant novel information. Therefore those higher in ASA don't become bored and those lower in ASA don't feel threatened − resulting in similar processing from both groups. None-the-less the results do suggest that individual differences in motivational reactivity −

particularly in defensive system reactivity − are influencing processing. Since ASA and DSA also influence choices about hobbies, activities, what to view in the media, and even things like substance use and abuse − it seems logical to argue that that certain target markets may include higher proportions of specific motivational types.

The results of the current study imply that moderately arousing stimuli do not allocate much more resource from people higher in ASA than those lower. Though disappointing, it is not so surprising. A. Lang, Shin, & Lee (2005) found participants higher in ASA steeply increased viewing time looking at image stimuli when arousal level reached an extreme level whereas lower in ASA changed little. The results of the current study and the study by A. Lang, Shin, & Lee (2005) suggest that, in order to target this population, advertisers should use positive and highly arousing images to attract their attention. When advertising equipments for high-risk sports such as bungee jumping, which is the kind of sport that is likely to attract people higher in ASA, the advertiser may want to use positive elements (e.g., love, humor, beauty, positive values in the target market's culture) for maximum. Thus the strategy could be to raise the intensity level of the stimuli for higher ASA people. Further research is necessary to manifest the appropriate intensity level to attract higher ASA people.

People higher in DSA are afraid of going out, but rather stay in the environment they are already in (A. Lang, 2006a; 2006b). This suggests that when people higher in DSA watch an object for whatever reason, they are likely to learn more about it than those lower in DSA. If the Internet ad is about self-defense gear such as stun guns, moderately arousing and fearful content may be helpful to target potential consumers rather than using images or video clips that are packed with action and/or filled with dead bodies. This is because people higher in DSA, who are likely to be more interested in self protection, are likely to pay attention and remember information provided in negative tone, though they may not want to be over-stimulated by negative content.

The criterion bias data also provided significant and interesting results. Past research has not had any empirical evidence about the relationship between the motivational activation and decision-making yet. It is easy to assume decision-making process will be influenced by personal traits. The criterion bias data reveal participants higher in ASA had a more conservative decision criterion, indicative of more reluctance to say "yes, I remember seeing it," compared to participants lower in ASA. Higher DSA individuals also showed a more conservative decision criterion compared to lower DSA individuals. What could be the underlying reasons for these results?

In general, as the consequence of false identification (false alarm) gets more serious, the respondent's tendency of making a false identification decreases at the cost of failing to make a correct identification − in other words, the respondent tends to move into a more conservative decision criterion (Fox, 2004; MacMillan & Creelman, 1991). For example, if a person confronts a line-up for a murder case, the witness may feel an emotional burden, thinking that a false identification could ruin an innocent person's reputation (Shapiro, 1994). As a result, the witness is likely to be more careful about making false alarms than she would be under different circumstances, which is consistent with Frijda's (1988) argument that "a tendency exists to view it in a way that minimizes negative emotional load" (p. 356). Individuals higher in DSA might put in more effort to reduce their negative emotional loads by making their criterion bias more conservative in making decisions.

Interpretation of the results on different ASA groups (H5) is somewhat more complex than results for DSA (H6). It is very cogent that individuals higher in ASA would show a tendency to say yes more easily than individuals lower in ASA since individuals higher in ASA are more likely to exhibit risk-taking behavior in general. However, the result was contrary to this prediction. Past research suggests a possible reason that individuals higher in ASA show more conservative decisions. Peeters & Czapinski (1990) suggested that exploratory tendency is strongly associated with a remarkable sensitivity for aversive stimuli resulting in a subjective overemphasis of the negative ones. This is because uncontrolled exploratory behavior is always

accompanied with unexpected dangers. Thus, people higher in ASA might show a stronger tendency of being cautious during their approach behavior to prevent unexpected interference of unpleasant events. These speculations about the results for the criterion bias data needs future studies to examine whether there is a general tendency for the relationship between the motivational types and the decision making process.

The current study used college participants. This may also explain several approaching significances found in this study. As a sample, college students make quite a homogeneous group. It is plausible to contemplate that people very high in appetitive activation, as probably high sensation seekers, may not seek education but seek careers at early ages (A. Lang, Shin, & Lee, 2005). College students attending a large state university represent a small range of the general population for this study. Thus, should this study be replicated using a sample with more variety, the difference among different motivational types could be greater to reach statistical significance.

Overall, the result of this study implies that using individual variation in motivational activation should be helpful for creating Internet advertisements with positive or negative content in order to target to specific type of consumers. Internet advertising research based on individual differences in motivational activation is a new approach to the topic. This study has shown the potential of this approach to research for Internet advertising techniques such as pop-up and banner advertisements. It will be useful to explore how differences in motivational activation influence the processing of the advertisement messages and related behavioral responses.

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APPENDIX

Example of a stimulus where a pop-up advertisement is displayed over a News Article.