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**When Disaster Strikes Abroad: Cognitive and Emotional Processing of Foreign Sensational Television News Stories**

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ABSTRACT

This study explored the effects of an event proximity and sensationalism on the cognitive and emotional processing of aversive television news stories about natural disasters and accidents. Cognitive resources allocated to encoding, measured with the use of psychophysiological tools and recognition memory tests, and self-reported emotional arousal were used to assess the impact of the two variables. Viewers (N=38) rated sensational and international television messages as more arousing. They also allocated more resources to processing international rather than domestic news stories. Highly sensational international stories were the strongest “attention grabbers.” Implications of these findings are discussed in relation to news event typicality and physical and mediated proximity.

**Keywords:** sensationalism, proximity, international news, LC4MP, cognitive and emotional processing

### **When Disaster Strikes Abroad: Cognitive and Emotional Processing of Foreign Sensational Television News Stories**

Over the past 60 years, mass communication scholars have been discussing news factors that affect the selection of international news by journalists (Chang, Shoemaker, & Brendlinger, 1987; Galtung & Ruge, 1965; Shoemaker & Cohen, 2006). Yet, little is known about how individuals psychologically process international news selected in accordance with these news factors. This study combines a two-dimensional model of news determinants (Shoemaker & Cohen, 2006) with a human information processing approach (Lang, 2000, 2006) to explore the effects of proximity and sensationalism, the most prominent factors in international news coverage, on television viewers. We argued that these news determinants are psychologically meaningful and therefore will affect the cognitive and emotional processing of foreign news messages.

Numerous studies indicate that the coverage of international events is often incomplete, inaccurate, and negative (Martin-Kratzer & Thorson, 2010; Weaver & Wilhoit, 1983). As Wanta and Golan (2010) note, only a very small number of news stories from distant places pass media gatekeepers and occupy the front pages of national newspapers and prime-time broadcasts. Crises, casualties, conflicts, terrorist attacks, accidents, and disasters often set the agenda of international news reports (Wanta & Hu, 1994; Weaver & Wilhoit, 1983), making foreign nations a constant source of sensational information and contributing to negative impressions of the world among domestic media users (Wanta, Golan, & Lee, 2004).

With the previous research investigating international news coverage (Martin-Kratzer & Thorson, 2010; Weaver & Wilhoit, 1983) and its effects on knowledge of foreign affairs (Beaudoin, 2004, 2008) and attitudes toward foreign countries (Semetko et al., 1992; Wanta et al., 2004; Wanta & Hu, 1993), this study is an attempt to add to the existing body of literature by understanding psychological processing of international news. Studying cognitive and emotional processing of international news is an important node in the chain of research of foreign news effects. First, studying attention to mediated messages and memory for mediated message information can explain how knowledge about foreign nations is built. Second, exploring cognitive and emotional message processing can contribute to future research of international news effects on individuals' attitudes toward the world outside the national borders.

In this study, we examined the overtime emotional and cognitive responses of the audience to international television news stories with the aim to find whether these stories elicit emotional arousal, as well as attract attention to and improve memory for foreign events covered by television messages. Furthermore, we focused on two news factors, proximity and sensationalism, that best define international news. Because television use has been found to affect international knowledge (Beaudoin, 2004, 2008; Korzenny, Toro, & Gaudino, 1987; Vincent & Basil, 1997) and television messages have been studied as having a strong appeal to human senses (Grabe et al., 2000, 2001; Grabe, Lang, & Zhao, 2003; Hendriks Vettehen et al., 2005; Hendriks Vettehen, Nuijten, & Peeters, 200), we used television international news to design the study experiment.

### **Proximity and Sensationalism in News**

Mass communication scholars have suggested numerous factors that affect international news flows, including negativity, sensationalism, unexpectedness, and proximity of news events (Galtung & Ruge, 1965; Östgaard, 1965; Rosengren, 1974). Chang et al. (1987) classified international news determinants by distinguishing between context-oriented and event-oriented factors. While a context-oriented approach accumulates external geographic, socio-economic, and cultural determinants, an event-oriented approach takes into consideration the nature of news events and refers to internal factors such as event deviance and relevance (Chang et al., 1987; Golan, 2010; Shoemaker, Chang, & Brendlinger, 1986; Shoemaker & Cohen, 2006).

Examining event-oriented factors from the perspective of cultural and biological evolution, Shoemaker and Cohen (2006) proposed a two-dimensional model of news determinants based on the interplay between social significance and deviance. They defined social significance based on relevance to a social system, be it a local community, country, or the world. Relevance often intertwines with proximity. Galtung and Ruge (1965) stated that a news determinant of meaningfulness combines relevance and cultural proximity. Graber (1989) elaborated on the principle of event familiarity involving both proximity and relevance.

The second dimension of this model is deviance, which is closely tied to novelty, conflict, and sensationalism. Shoemaker and Cohen (2006) distinguished among three types of deviance: normative, pathological, and statistical. Normative deviance refers to breaking social norms and the law. Pathological deviance represents a threat to existing social order and the potential to change social norms in the future. Statistical deviance is related to odd and unusual events, ideas, or people. Destructive natural disasters and accidents can be placed in the category of statistical deviance because they do not happen on a regular basis.

Applying Shoemaker and Cohen's (2006) two-dimensional model, we aimed at exploring how social significance and statistical deviance affect cognitive and emotional processing of international and national television news stories. Proximity and sensationalism were used in this study to represent the two dimensions. The following sections explicate proximity and sensational production values as psychologically relevant factors that influence how the information in these news stories is processed.

### **Proximity and News**

Proximity is a complex concept that has been studied with regards to geographic, cultural, and psychological dimensions. Traditionally, news proximity has been understood in relation to location, place, and geographic or physical nearness of a news object. Galtung and Ruge (1965) considered geographic structure as the point of departure in their theoretical work about features of foreign news since news is produced in "autonomous" nations and territories. Palmgreen and Clarke (1977) categorized news based on the level of political system determined by local, state, and national borders.

Geographic proximity has been a significant predictor of news selection, the extent and nature of coverage, and news source diversity (Berkowitz & Beach, 1993; Kepplinger & Ehmig, 2006; Shapiro & Driskoll, 1994; Shapiro & Schofield, 1986). Some

studies have focused on the area of psychological effects of geographic news proximity. Donnelly (2005) found that media users reported a greater awareness of local stories than non-local stories, regardless of story format. Utilizing psychophysiological methodology, Wise, Eckler, Kononova, and Littau (2009) found that health-threat proximity in news stories elicited greater allocation of cognitive resources to news processing and led to a greater accuracy in recognizing story details.

Despite the conceptual and operational simplicity of geographic proximity, some studies produced results inconsistent with what the principle of geographic proximity predicts (Luttbeg, 1983). Luttbeg (1983) stressed the importance of perceived proximity determined by cultural factors rather than by geographic distance alone. Common language, socio-economic, cultural and historical similarities, and cultural capital have been shown to influence news selection and media use (Johnson, 1997; Ksiazek & Webster, 2008; Östgaard, 1965; Straubhaar, 1991; Trepte, 2008). Empirical evidence suggests that cultural proximity is a powerful determinant of news and media use, along with geographic proximity (Adams, 1986; Johnson, 1997; Zaharopoulos, 1990).

Geographic and cultural proximity are thought to be macro-level variables, accounting for geopolitical and cultural characteristics of a system. On the contrary, psychological proximity, to a great extent, depends on individuals' perceptions and impressions of territorial and social units. Mass communication scholars emphasize the importance of perceived proximity, or distance, to a news event or object (Donnelly, 2005). The concept of psychological proximity has four dimensions: temporal, hypothetical, spatial, and social (Lieberman, Trope, & Stephan, 2007). Temporal distance is related to proximity in time; hypothetical – to alternatives to reality; spatial – to physical proximity; and social - to proximity to other individuals and social groups. Spatial and social distance are especially relevant to international news research as spatial distance can represent geographic proximity to news events and objects while social distance refers to the perceived closeness to a foreign nation.

For these reasons, we argue that proximity is a psychologically meaningful feature of international news stories in that these stories cover events that occur in a geographically distant place and more directly affect individuals who are socially distant from the audience member. This may mean not only that viewers will know fewer things about these distant places and cultures, but also that viewers will perceive these stories to be of less relevance. These elements should affect the cognitive and emotional responses evoked by messages dealing with events that are more and less proximate to the viewer.

To examine the effects of proximity, this study focused on geographic proximity as an independent variable operationalized as the level of nation (domestic vs. foreign news). It is important to note that geographic distance was understood in this research in a somewhat abstract sense, expressing “foreign” as separated by national borders rather than by a precise number of miles. As nation is not only a geopolitical but also a social unit, social distance, or the feeling of closeness to other nations (Bogardus, 1922; Parillo & Donoghue, 2005) was included in this study as a control variable.

### **Sensationalism and News**

The concept of sensationalism has been widely discussed with regards to news structure and values, media content, and the audience reactions to media messages.

Numerous studies have examined sensational news topics, such as crimes, violence, accidents, and disasters, and the proportion of sensational to non-sensational media coverage (Adams, 1978; Davie & Lee, 1995; Hofstetter & Dozier, 1986; Slattery & Hakanen, 1994). Some scholars conceptualized sensationalism based on media users' reactions to sensational news (Grabe, Zhou, & Barnett, 2001; Hendriks Vettehen, Nuijten, Beentjes, 2005; Tannenbaum & Lynch, 1962). This phenomenon has been linked to effects on the human sensory system, in particular, to arousal and emotional responses to media messages. With a focus on audience responses emerged a deeper understanding of sensational news features that take into consideration the form in which news content is presented. Grabe et al. (2001) distinguished between sensational content of news and sensational structural features that can lead to viewers' arousal. Scholars divided news content into sensational (crimes, disasters, accidents, celebrity news, scandals, and sex) and not sensational (politics, economics, education, health/medicine). Structural features included a number of technological elements that journalists use in order to elicit media users' emotional and cognitive reactions.

Taking into consideration the evidence that international news coverage is often negative and sensational (Martin-Kratzer & Thorson, 2010; Weaver & Wilhoit, 1983), thus, allows little variation, we focused on the structural side of sensationalism in this research. The previous literature on sensationalism in news (Grabe et al., 2000, 2001; Grabe, Lang, & Zhao, 2003; Hendriks Vettehen et al., 2005; Hendriks Vettehen, Nuijten, & Peeters, 2008) suggests television as a medium that provides the strongest sensational effects produced by message structural features. The techniques used by television reporters include video maneuvers and production effects such as zooming, eyewitness camera, point-of-view, audio manipulation, transitional effects, and others (Grabe et al., 2001). It has been found that message structural features significantly affect cognitive and emotional responses to sensational stories. In the study on the effects of tabloid news on emotional processing, attention, and memory, Grabe and colleagues (2000, 2003) found that tabloid stories increased attention and emotional arousal of viewers. However, this format did not improve recognition memory and delayed recall due to possible cognitive overload caused by sensational stories. Hendriks, Vettehen et al. (2008) found that sensational features in television news increased emotional arousal of viewers. To a certain point, emotional arousal was positively correlated with liking news stories; however, liking decreased when arousal was very high. To summarize, structural features of sensationalism can be considered a psychologically meaningful variable in that it affects cognitive and emotional responses, such as increased arousal, valenced emotional responses and differences in encoded information.

### **Psychological Relevance: Implications for Processing**

As previously argued, this study treats proximity and sensationalism as psychologically meaningful features of media. The Limited Capacity Model of Motivated Mediated Message Processing (LC4MP; Lang, 2006) was used as a framework for predicting how viewers will emotionally and cognitively respond to these features of international news. In this study, proximity was manipulated as a characteristic of news content with two levels, "international" and "national" news, and sensationalism was manipulated mainly in structural ways (i.e. camera zooms; eyewitness camera; and

visual, audio and transitional effects (Grabe et al., 2000, 2001, 2003; Hendriks Vettehen et al., 2008)). Only sensational negative news story topics such as natural disasters and accidents were selected to create the experimental manipulation; thus, story content and valence were kept constant.

According to the LC4MP, these structural and content manipulations have implications for how these news messages are processed. One of the bases upon which this model is built is that the human cognitive system has a limited amount of cognitive resources. Allocation of these limited resources to encoding, storage, and retrieval of mediated information can be controlled, which involves consciousness, awareness, and effort, or automatic, which does not involve conscious volition (Lang, 2000). Encoding refers to selection of information from the environment and creating mental representations of stimuli. Storage is the process of linking previously stored to recently encoded information. Retrieval is related to the recall of information previously stored in memory in order to form these links (Lang, 2006). While controlled allocation of cognitive resources to message processing can involve an individual's conscious intention to obtain information (i.e., reading a book to do homework), automatic allocation can occur unintentionally. Relevance of stimuli as well as the occurrence of novel, unexpected message elements can elicit automatic, involuntary attention (Lang, 2000, 2006). Message structural features, such as sound, motion, and visual effects have been found to increase the level of automatic allocation of resources to message processing (Fox, Lang, Chung, Lee, & Potter, 2004; Lang, 2006; Lang, Borse, Wise, & Prabu, 2002; Potter, 2000).

A second major assumption of the LC4MP is that the human motivational system, which is comprised of the appetitive or approach system and the aversive or avoidance system, biases the allocation of cognitive resources to encoding, storage, and retrieval based on levels of activation. Further, how arousing the information being taken in by the individual is highly related to levels of activation in these systems; greater arousal generally increases activation in both the aversive and appetitive systems (Lang, Bradley, & Cuthbert, 1997). Both systems can be co-activated, activated one at a time, or not activated at all. It is thought that the appetitive system is activated in response to information related to the biological imperatives of procreation and survival (i.e. food and sex), as well as pleasantly toned emotional messages. When there is an increase in the activation of appetitive system, an individual increasingly allocates resources to encoding and storage (Lang, 2006).

The aversive motivational system is activated in response to stimuli related to the biological imperative of survival (i.e. threats) as well as unpleasantly toned emotional stimuli. The LC4MP hypothesizes that as the intensity of aversive stimuli increases, for example, a tragic event is shown in close geographical distance and in a sensational manner, cognitive resources should first be allocated to both encoding and storage, but, at the highest levels of stimulus intensity, cognitive resources should shift from encoding to storage and retrieval to engage an individual in an appropriate defensive response (Lang, 2006; Lang & Yeghyan, 2009; Leshner, Bolls, & Thomas, 2008). As this last stage (withdrawal response) is rarely observed with mediated stimuli, this study assumes a linear relationship between the aversive intensity of news stories and the levels of viewers' emotional arousal and cognitive resource allocation to information processing.

We argue in this study that proximity and sensationalism are powerful factors that can affect viewers' levels of emotional arousal and cognitive resource allocation. Proximity, which is represented by two levels, international and national news, is a combination of spatial and social distance from a news event. Spatial distance relates to the geographic proximity of the events and objects in question while social distance refers to the perceived closeness to a foreign nation and its people. Physically close objects can elicit greater emotional responses because they are motivationally relevant, or likely to activate the appetitive and/or aversive motivational systems due to the need to be prepared to act on objects that pose an immediate threat or opportunity (Miller, 1944; Lewin, 1951, both cited in Fiedler, 2007). Social proximity is also characterized by stronger emotional experiences (Liberman et al., 2007). This study aimed at exploring whether mediated proximity, or proximity of events in news messages, would affect viewers' emotional responses in a similar way. We argue that more proximate news events covered in television stories should elicit greater self-reported emotional arousal and that events happened in foreign countries would lead to a lower level of self-reported arousal. Thus,

H1: International news stories will elicit a lower level of self-reported emotional arousal than domestic news stories.

Previous research findings (Grabe et al., 2000, 2003; Hendriks Vettehen et al., 2008) indicated that structurally sensational television messages increased emotional arousal among viewers. Based on these findings, we hypothesized that:

H2: Highly structurally sensational news stories will elicit greater self-reported emotional arousal than low structurally sensational news stories.

According to LC4MP, the negative emotional content inherent to these news stories regarding natural disasters and accidents should elicit greater resource allocation to encoding and storing information (Lang, 2006). Further, the greater structural complexity of the structurally sensational messages should increase automatic allocations of resources to encoding. Therefore, sensational messages should elicit greater cognitive resource allocation to encoding the messages, as indexed by heart rate deceleration (Lang, 1994), which should lead to greater recognition. Previous research shows that heart rate tends to decelerate to a greater extent when people allocate greater amounts of resources, or pay more attention, to a message (Lang, 1994). In addition, recognition tests have been utilized to indicate how well media users encode information (Lang, 2006). Thus,

H3: Viewers' heart rates will decelerate to a greater extent during more structurally sensational news stories compared to less structurally sensational news stories.

H4: Viewers will recognize details from more structurally sensational news stories better than less structurally sensational news stories.



Events that are more physically and socially proximate to viewers, especially those that are negative and threatening, should activate the aversive motivational system, which in turn will increase automatic resource allocation to encoding this information. Thus, domestic news stories should elicit greater heart rate deceleration and therefore greater recognition accuracy when compared to international news.

H5: Viewers' heart rates will decelerate to a lower extent during international news stories compared to domestic news stories.

H6: Viewers will recognize details from international news stories worse than from domestic news stories.

One of the main goals of this study was to examine how sensational structural features would affect the processing of international news, which is inherently about events that are socially and physically less proximate to viewers. Thus, we asked:

*RQ1: How will the two features of news, proximity and sensational structure, interact to affect the viewers' emotional arousal, processing of the information, and subsequent ability to recognize details?*

### Method

This study employed a 2 (proximity: national vs. international) x 2 (sensationalism: high vs. low) x 3 (message repetition) x 20 (time: 60 seconds per message divided to 20 three-second segments) mixed experimental design. *Proximity* was manipulated as a within-subjects factor with two levels. Half of the television stories were about natural disasters and accidents that happened in the United States, and the other half dealt with tragedies in foreign countries. Another manipulated within-subjects factor was *sensationalism*. This factor also had two levels. High sensational messages contained sensational structural features such as zooming, eyewitness camera, and visual, audio and transitional effects (Grabe et al., 2000, 2001, 2003; Hendriks Vettehen et al., 2008) while low sensational videos did not include these features.

The *message repetition* within-subjects factor was included in this study to create a multiple-message design (Reeves & Geiger, 1994). Three different messages about natural disasters and accidents were produced for each of the four experimental conditions (high sensational/national, high sensational/international, low sensational/national, and low sensational/international). *Time* was defined by the length of each video, which was 60 seconds, divided to 20 three-second segments. MediaLab software (Jarvis, 2002) automatically randomized experimental conditions and messages to eliminate order effects.

### Dependent Measures

**Heart Rate.** Attention, or cognitive resources allocated to message encoding, was measured by obtaining participants' heart rates while viewing the television news stories. Participants' heart rates were measured by using two Beckman standard 8mm Ag-AgCl electrodes placed on the subjects' forearms (a ground electrode was also placed on each

participant's non-dominant forearm). The heart rate signal was passed through a Coulbourn bio-amplifier with a 60 Hz notch filter. A Schmidt trigger was used to identify QRS spikes. Raw data was collected as milliseconds between beats (IBIs) and converted into beats per minute (BPM). Missing data were replaced using truncation and interpolation procedures as necessary. WinDaq software (DATAQ Instruments, Akron, OH) coordinated the sampling and storage of physiological data.

**Emotional arousal.** After watching each story, participants reported their emotional arousal on a 7-point scale from "Not arousing at all" to "Very arousing."

**Recognition memory.** Recognition memory measures indicate how well mediated messages are encoded. Signal detection test (SDT) has been widely used to measure recognition memory (Shapiro, 1994; Fox, 2004). SDT deals with two measures. The first measure, *sensitivity*, indicates how accurately a person recognizes stimuli details. The second measure, *criterion bias*, shows "how liberal or conservative a person is in deciding if a probe matches a memory" (Shapiro, 1994, p. 137). Participants were asked 48 true and false questions about the content of each message. Proportions of hits ( $p(h)$ =number of hits / number of true questions) and false alarms ( $p(FA)$ =number of false alarms / number of false questions) were calculated for each participant and each condition. Then, indexes of sensitivity ( $A'$ ) and criterion bias ( $B''$ ) were obtained by using the following formulas (Shapiro, 1994, p. 144):

$$A' = 1 - .25 \times (p(FA) / p(h) + (1 - p(h)) / (1 - p(FA)))$$

$$B'' = (p(h) \times (1 - p(h)) - p(FA) \times (1 - p(FA))) / (p(h) \times (1 - p(h)) + p(FA) \times (1 - p(FA)))$$

### Control variables

**Social distance.** To ensure that the feeling of social closeness did not affect our manipulation, *social distance* was measured as a self-report variable. Bogardus (1922) generated the Social Distance Index, which has been successfully used in a number of studies (Parillo & Donoghue, 2005; Wilson, 1996). Participants were asked to what extent they were willing to be close with a representative of each nation (an American or a person from a foreign country). The feeling of closeness was measured on a seven-point scale. Each point corresponded to a situation of social closeness from marriage, friendship, and neighboring to exclusion from the native country (Bogardus, 1947). A repeated-measures ANOVA showed that geographic proximity strongly predicted social distance ( $F=20.24, p<.01$ ). The participants felt socially closer to Americans ( $M=1.6$ ) than to representatives of foreign countries ( $M=2.5$ ). The sensationalism factor was not significant in predicting social distance ( $p=.55$ ).

**Preexisting knowledge of news events.** To ensure that previous knowledge of news events did not affect the responses to manipulated stories, the level of awareness of each news event was measured on a 7-point scale from "Not aware of the event" to "Strongly aware of the event." Although the level of knowledge varied across messages, factor analysis and reliability tests indicated that the awareness scores did not load well in

each condition (Table 1). Included as covariates in statistical tests, none of the 12 preexisting knowledge scales was significant in predicting dependent measures.

Table 1. *Reliability analysis for social distance, preexisting knowledge, and arousal scales (Cronbach's alpha reported)*

|                                | Social distance | Preexisting knowledge | Arousal |
|--------------------------------|-----------------|-----------------------|---------|
| High sensational national      | .83             | .27                   | .67     |
| High sensational international | .90             | .38                   | .75     |
| Low sensational national       | .89             | .44                   | .77     |
| Low sensational international  | .87             | .35                   | .63     |

**Demographics.** Travel experience and demographic variables such as gender and race were statistically tested for possible covariation. The variables were not significantly associated with the dependent measures and were excluded from the analysis.

**Participants**

Thirty-eight undergraduate and graduate students from a Midwestern university took part in the experiment. As power analysis performed with the use of G\*Power software (Faul, Erdfelder, Lang, & Buchner, 2009) indicated, this sample was acceptable for the four-condition within-subjects experimental design. All participants were American citizens. The age varied from 18 to 29 years old. Sixty-eight percent of students were females, and 32% were males. The sample was predominantly White (92%); 5.3% were African-Americans; and 2.5% were Latino/Hispanic. Eighty-two percent of participants reported that they had traveled abroad, while 18% had never been to foreign countries. Each subject received extra-credit for participation in the study.

Twenty-nine subjects were included in the heart rate analyses; nine were excluded due to experimenter and computer error during data collection.

**Stimulus Materials**

Each participant watched twelve 60-second television news stories about natural disasters and accidents. Six news stories were about domestic events, and other six dealt with events in foreign countries. Six stories were highly sensational and six were low sensational. To make sure that participants knew the geographic location of each event, we identified the place (country or state) of each disaster and accident before showing each news story. See Table 2 for more information about story topics.

To design stimuli for this experiment, we used footage of natural disasters and accidents taken from YouTube. These clips were edited to create six high sensational and six low sensational television stories. High sensational videos included zooming and eyewitness camera effects, dramatic audio such as tense music, obtrusive voice of a

reporter, screaming victims, unexpected sounds, and transitional effects such as flash frames.

Table 2. *Topics of television news stories*

|                | High sensational  | Low sensational   |
|----------------|---|---|
| High proximity | <ol style="list-style-type: none"> <li>1. Fire in Oregon</li> <li>2. Tornado in Oklahoma</li> <li>3. Hurricane in Florida</li> </ol>          | <ol style="list-style-type: none"> <li>1. Bridge collapse in Minneapolis</li> <li>2. Hurricane in Mississippi</li> <li>3. Flood in Florida</li> </ol> |
| Low proximity  | <ol style="list-style-type: none"> <li>1. Earthquake in Peru</li> <li>2. Tsunami in Thailand</li> <li>3. Airplane crash in Ukraine</li> </ol> | <ol style="list-style-type: none"> <li>4. Fire in Spain</li> <li>5. Cyclone in Australia</li> <li>6. Drought in Africa</li> </ol>                     |

**Procedure**

After giving their informed consent to participate, subjects were seated in a recliner chair with a clear view of a large TV screen. Sensors were placed on their arms. Each participant was asked to view 12 television news stories about natural disasters and accidents and, after each story, answer questions about arousal, preexisting knowledge, and social distance. After viewing all stories, students reported demographic information. All sensors were removed. Then, participants answered 48 True/False recognition test questions. Each person taking part in the experiment was debriefed upon finishing the study.

**Data reduction and statistical analysis**

Data reduction was done for self-reported variables. Four scores corresponding to each experimental condition were calculated for social distance, preexisting knowledge, arousal, and measures of recognition memory (sensitivity and criterion bias). The results of reliability analysis for social distance, preexisting knowledge, and arousal scales are presented in Table 1. To calculate indexes of sensitivity and criterion bias, responses to true and false questions were grouped by condition, totals of hits and false alarms were calculated and, then, sensitivity (*A'*) and criterion bias (*B''*) values were obtained.

Heart rate data were analyzed across time in three-second segments. This analysis was conducted using change scores, which were calculated by subtracting values of the second prior to onset of the messages from each subsequent second's value. Due to sphericity violations typical in physiological analyses, Greenhouse-Geisser corrected p-values are reported. Uncorrected degrees of freedom are reported for ease of reading.

**Results**

**Hypothesis 1**

Hypothesis 1 predicted that international news stories would elicit a lower level of self-reported emotional arousal than domestic news stories. Mean arousal scores for each proximity x sensationalism cell were computed and submitted to a 2 (proximity: national, international) x 2 (sensational: sensational, non-sensational) repeated-measures ANOVA.

The proximity factor did not have a main effect on self-reported arousal ( $p=.50$ ). Hypothesis 1 was not supported.

**Hypothesis 2**

Hypothesis 2 predicted that highly structurally sensational news stories would elicit greater self-reported emotional arousal than low structurally sensational news stories. A main effect for structural sensationalism was found,  $F(1,37)=.47, p<.0001, \eta_p^2=.50$ , such that highly sensational messages ( $M=4.39, SE=.16$ ) received greater arousal ratings than low sensationalism messages ( $M=3.76, SE=.17$ ). Hypothesis 2 was supported.

**Hypothesis 3**

Hypothesis 3 predicted that viewers’ heart rates would decelerate to a greater extent during more structurally sensational news stories compared to less structurally sensational news stories. BPM data were submitted to a 2 (sensational: low, high) x 2 (proximity: domestic, international) x 3 (repetition) x 20 (time) repeated-measures ANOVA. No sensationalism x time interaction was found,  $F(19, 456)=.89, p=.52$ . However, the quadratic trend approached significance  $F_{quad}(1,24)= 3.19, p=.08, \eta_p^2=.12$ . Please see Figure 1. This finding suggests that viewers allocated a greater amount of cognitive resources to processing structurally sensational news stories compared to the processing of structurally not sensational news stories. Thus, hypothesis 3 was partially supported.

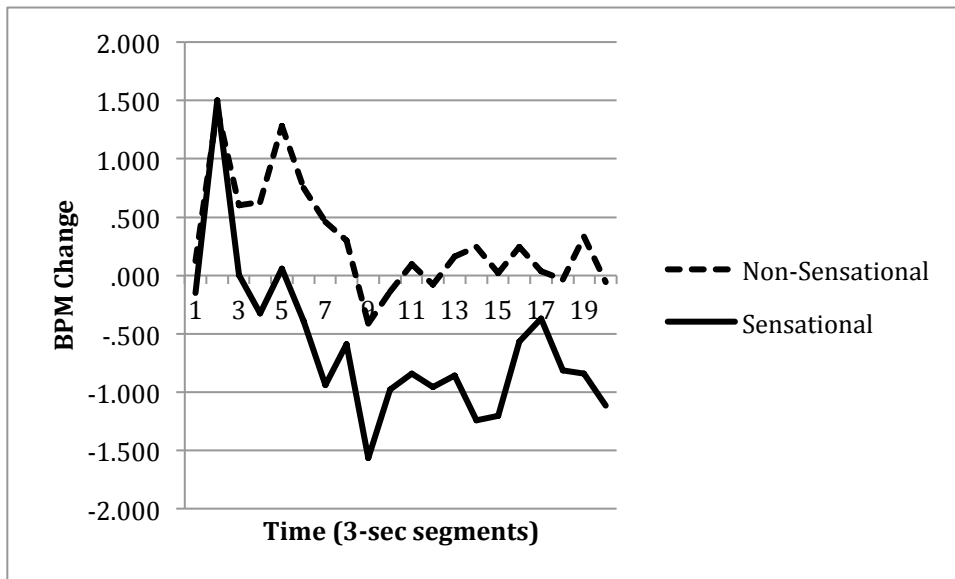


Figure 1. Sensationalism x time interaction on heart rate change (NS)

**Hypothesis 4**

Hypothesis 4 predicted that viewers would recognize details from more structurally sensational news stories better than less structurally sensational news stories. The main effect of sensationalism on recognition sensitivity was not significant ( $p=.34$ ). Hypothesis 4 was not supported.

**Hypothesis 5**

Hypothesis 5 predicted that viewers' heart rates would decelerate to a lesser extent during international news stories compared to domestic news stories. BPM data were submitted to a 2 (sensational: low, high) x 2 (proximity: domestic, international) x 3 (repetition) x 20 (time) repeated-measures ANOVA. A significant proximity x time interaction was found,  $F(19,456)= 2.61, p=.02, \eta_p^2=.10$ , such that international messages elicited more cardiac deceleration than national messages. Further, the linear trend was significant,  $F_{lin}(1,24)= 5.42, p=.03, \eta_p^2=.18$ . Please see Figure 2. Although the statistical test was significant, the results were opposite to what had been predicted in Hypothesis 5. Over the first 30 seconds of viewing, participants allocated more cognitive resources to international stories than to national stories.

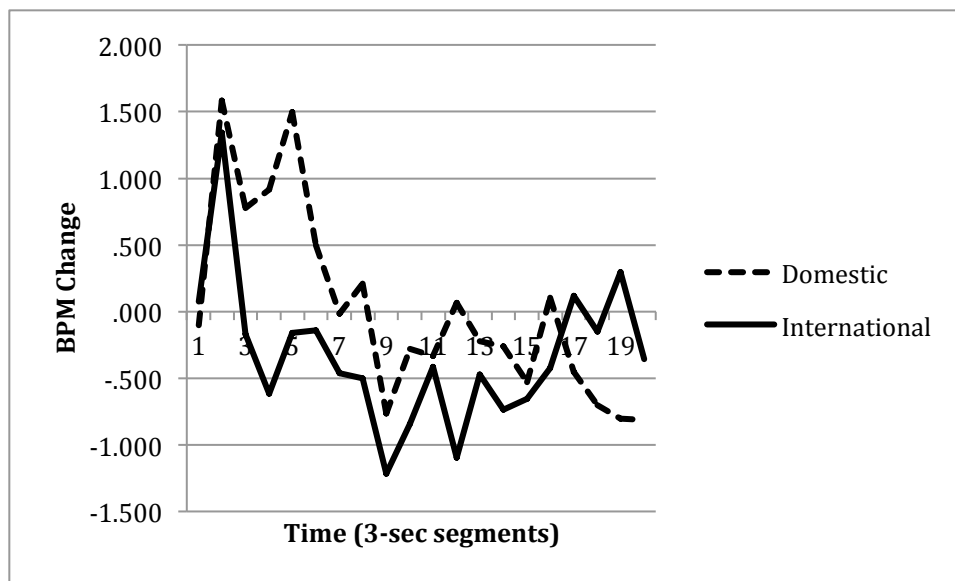


Figure 2. Proximity x time interaction on heart rate change

**Hypothesis 6**

Hypothesis 6 predicted that viewers would recognize details from international news stories worse than from domestic news stories. A signal detection procedure was used to analyze recognition memory scores. Sensitivity data were entered to a 2 (proximity: national, international) x 2 (sensational: sensational, non-sensational) repeated-measures ANOVA. The test indicated that participants recognized international stories ( $M=.66, SE=.02$ ) more accurately than national stories ( $M=.60, SE=.02$ ),  $F=6.85, p<.05, \eta_p^2=.16$ . The results were opposite to those predicted in Hypothesis 6; however,

they were consistent with the findings related to the effects of proximity on heart rate change reported as a test of Hypothesis 5 (please see above).

**Research Question 1**

Research question 1 asked how the two features of news, proximity and sensational structure, would interact to affect viewers’ emotional arousal, the processing of the information, and subsequent ability to recognize details from news stories.

Self-reported arousal data were submitted to a 2 (sensational: low, high) x 2 (proximity: domestic, international) x 3 (repetition) repeated-measures ANOVA. A proximity x sensationalism interaction was found for self-reported arousal,  $F(1,37)=.47$ ,  $p=.50$ ,  $\eta_p^2=.01$ . High sensational international messages ( $M=2.289$ ,  $SE=.22$ ) received the greatest self-reported arousal ratings followed by high sensational national messages ( $M=2.281$ ,  $SE=.20$ ).

BPM data were submitted to a 2 (sensational: low, high) x 2 (proximity: domestic, international) x 3 (repetition) x 20 (time) repeated-measures ANOVA. Levels of sensationalism x proximity interacted over time,  $F(19, 456)= 2.04$ ,  $p=.05$ ,  $\eta_p^2=.08$ , such that highly sensational international messages elicited the greatest cardiac deceleration, i.e. resource allocation. The linear trend also approached significance,  $F_{lin}(1,24)= 3.59$ ,  $p=.07$ ,  $\eta_p^2=.13$ . Please see Figure 3.

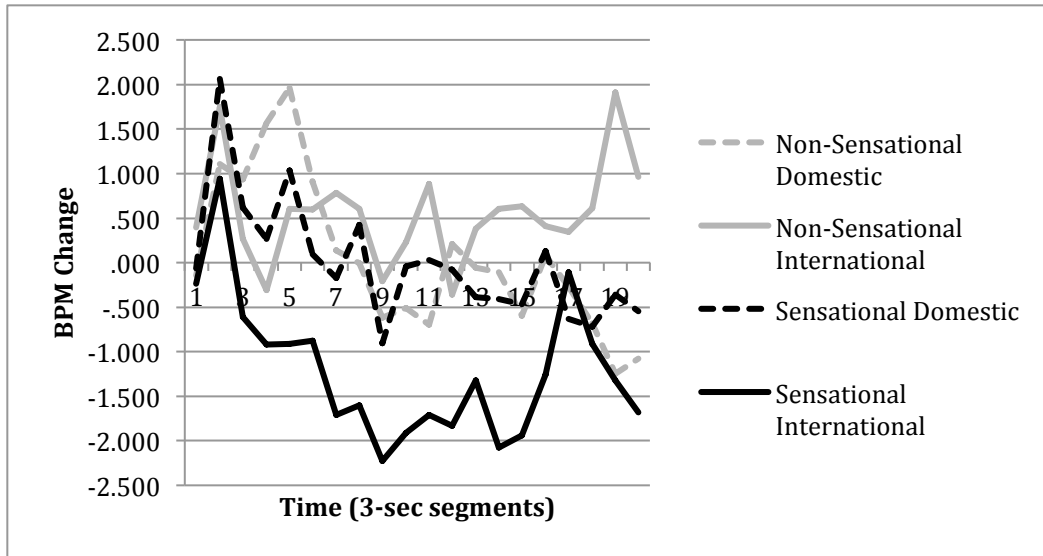


Figure 3. Sensationalism x proximity x time interaction on heart rate change

The signal detection test indicated interaction effects of proximity and sensationalism on criterion bias,  $F(1,36)=6.36$ ,  $p<.05$ ,  $\eta_p^2=.15$ . A 2 (proximity: national, international) x 2 (sensational: sensational, non-sensational) repeated measures ANOVA showed that participants tended to be more liberal (give more hits and more false alarms) to answer questions about low sensational national ( $M=-.2$ ,  $SE=.10$ ) and high sensational international ( $M=-.16$ ,  $SE=.10$ ) news stories. Viewers were more conservative (less willing to say “yes” during the recognition test) in their responses to questions about high

sensational national stories ( $M=.12, SE=.12$ ). Participants indicated a very low criterion bias answering questions about low sensational international stories ( $M=.005, SE=.12$ ). Please see Figure 4.

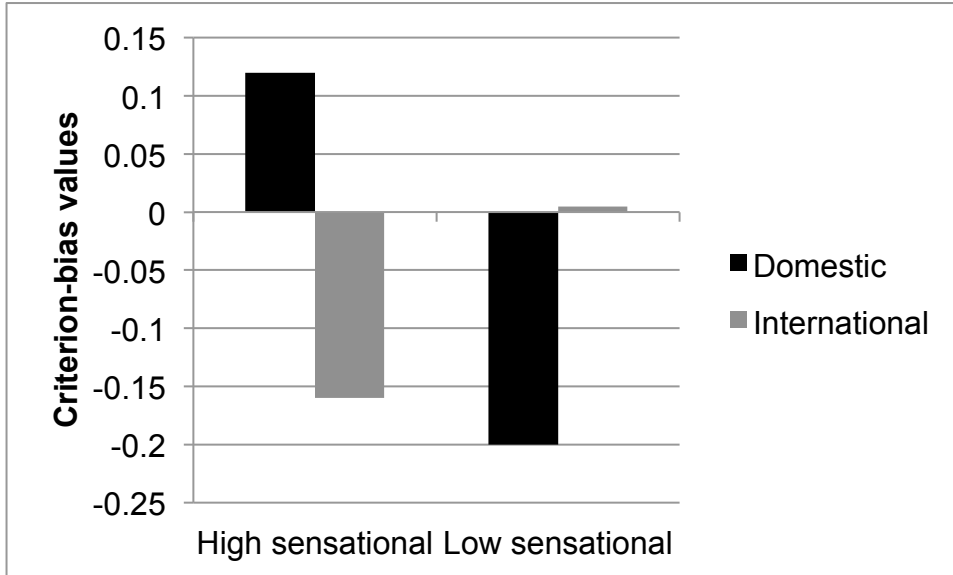


Figure 4. *Proximity x sensationalism interaction on criterion bias*

### Discussion

In this study, we aimed at exploring how television viewers cognitively and emotionally process international and national news that covers natural disasters and accidents in sensational and non-sensational manners. We hypothesized that viewers would experience a higher emotional arousal and allocate a greater amount of cognitive resources while watching domestic and sensational stories than international and low sensational news. The study indicated that viewers reported a higher arousal for high sensational messages. The participants also characterized high sensational international news stories as the most arousing, followed by high sensational national news stories.

Although we predicted that national messages would elicit a greater cognitive effect, the results showed the opposite. It was found that viewers paid more attention to international news stories than to national news stories over time. The findings also showed that the participants tended to be the most attentive to high sensational international news stories and the least attentive to low sensational national stories. Recognition memory indicated results that were consistent with those obtained for heart rate. Viewers recognized details from international stories more accurately than details from national stories. They also tended to be more conservative (less likely to answer “yes”) when answering questions about high sensational national messages. The finding with regards to criterion bias needs to be explored in future studies.

The results of the study were somewhat surprising as, in accordance with previous literature, we hypothesized that the viewers would allocate more cognitive resources to the news about domestic tragic events than to international stories. The level of participants’ familiarity with domestic events can possibly explain this finding. In this



context, the term familiarity may refer to typicality of news events (Shapiro & Fox, 2002) rather than to event knowledge, which was controlled for in the experiment. Typicality is related to expectedness of events based on mental schemas formed in memory by previous experiences (Shapiro & Fox, 2002; Stangor & McMillan, 1992). For example, an American can hear for the first time about a specific hurricane in Florida or a tornado in Oklahoma, but these types of natural disasters might be expected as they often receive national media coverage and occur in particular parts of the country. International news, on the contrary, can be characterized as atypical due to individuals' low level of foreign experience and random coverage of foreign nations. According to a number of memory models, people allocate more cognitive resources to the processing of atypical information and rely on preexisting mental schemas while processing typical messages. The processing of typical information is viewed as more automatic and happens with lower cognitive costs (Graesser, 1981; Shapiro & Fox, 2002; Stangor & McMillan, 1992). This theoretical argument gives a logical explanation of greater resource allocation to international news and needs to be tested in future studies. An additional explanation of this finding may be related to the fact that the retrieval of information about foreign places could require individuals to allocate greater amounts of resources than searching their memories for information about domestic events to make sense of them. This speculation suggests that not only recognition memory that reflect the level of encoding but also recall measures that can tell us something about the retrieval of knowledge about foreign nations should be utilized in future studies of international news cognitive processing.

Another important factor that could influence the results is the difference between mediated and physical proximity. This study assumed that mediated proximity would affect viewers in the same direction as physical proximity does, e.g. proximate objects or news events would activate the aversive motivational system and, as a result, evoke higher emotional responses and attract more viewers' attention (Latene, 1981). This prediction could be true, if proximity was operationalized in this study as a structural feature that strengthens the feeling of physical presence by using various camera techniques (Hendriks, Vettehen et al., 2005). However, this research utilized geographic proximity as an abstract concept that represents the distinction between "domestic" and "foreign." As the results indicated, this type of mediated distance in news does not necessarily work in accordance with what the journalistic principle of proximity and the previous literature on physical proximity predict. In addition, the "safe" nature of television viewing activity might have played a significant role in the experiment. News reports about a catastrophe happening in real time and close to one's home would hypothetically affect viewers differently than news stories about disasters and accidents taken out of context and possibly perceived as entertaining.

Although the main effect of sensationalism on self-reported arousal was indicated, no sensationalism-by-time interaction effect on heart rate was found. First, this result can be explained by the negative nature of content for all manipulated messages. Since the content of all messages was somewhat sensational (disasters, accidents), it could reduce the variation among participants' responses. Second, sensationalism was operationalized in the experiment by the presence or absence of sensational structural features in the messages and did not control for the exact number of cuts, zooms, transitions, and other elements. This could also weaken the manipulation.

Finally, interpreting the results of the current study, we have to keep in mind that the participants had to watch both international and domestic news stories during the experiment. It means that they could not select news stories of their interest to view. The experimental design, thus, could reduce the level of ecological validity. Perhaps, if participants viewed television in real setting, i.e., were free to select news/channels to attend, their choice of messages would affect cognitive and emotional processing of mediated information in a different way.

Overall, psychophysiological and self-report data supported the proposition that international sensational news has a great capability of eliciting emotional and cognitive responses among television viewers. Curiously, while high sensational international stories were more resource demanding and memorable than low sensational international news, there were no significant differences between high and low sensational domestic messages. This finding raises an interesting question about the role of emotion in the processing of stories on about typical news events. In particular, future research should examine whether automatically processed typical information reduces the effects of emotion-appealing news content. Another interesting relationship waiting for further exportation is the relationship between sensational content that elicits higher emotional responses and perceived social distance. Will emotionally appealing international news stories reduce social distance to a foreign nation perceived by an international story recipient? Finally, the study results showed that non-sensational international stories are the least emotionally appealing and memorable, which suggests journalism scholars and practitioners should look for more effective ways to deliver important, yet not sensational, international news.

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