

## ABSTRACT

Title of Document: THE EFFECT OF EMOTION AND CULTURE  
IN ONLINE NEWS IMAGES ON MEMORY  
AND ATTRIBUTION ASSESSMENT OF  
SUBSEQUENT TEXT

Jing Guo, Doctor of Philosophy, and 2013

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This study is an experiment exploring the effect of emotion-laden and culturally salient news images on the processing of the subsequent news text in the online news setting. It argued that emotional and cultural elements carried in the news images can act as influential "heuristics" that jointly define the memory specificity and attribution judgment of the news text.

This study pursued the concept of "culture" as it affects processing at a psychological level from both a dimensional perspective and a dynamic-constructivist approach. From a dynamic constructivist perspective, this study investigated the difference in the effect of seeing news photos portraying Chinese versus European Americans on news readers' memory and attribution of the text. From a dimensional view, it also examined the possible differences in attribution and memory as a result of the readers' own cultural identity, as being either European American or Chinese.

The experiment used a 2X2X2 repeated measures design. The three factors

included image emotion<sup>1</sup> (positive vs. negative: within-subject), image culture (Chinese individual vs. European American individual: within-subject), and participant culture (Chinese vs. European American: between-subject). Twenty four non-student American adults and twenty four non-student Chinese adults (who had just come to the United States from Mainland China for a short visit) participated in the experiment. Four different news topics that would be salient to members of both cultures were used. To minimize the unmeasured effects of any given stimulus topic, a repeated measures design was employed.

The results showed that news images alone did not have a significant impact on the overall memory for information in the news text. However, negative news images "narrowed" participants' memory, making them significantly less likely to recall the "peripheral" non-integral news information accurately, but this trend was prominent only when the images showed someone of the reader's own cultural group.

The data also indicated that after viewing negative news images, participants were four times more likely to attribute the news event to external situational causes rather than dispositional factors of the main figure in the news. This trend was least noticeable when the image portrayed European Americans and most dominant when the photo showed Chinese. Other findings are discussed in detail.

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<sup>1</sup> Images, text, or any other stimulus features do not have "emotions," or "cultures." Images and text can,

THE EFFECT OF EMOTION AND CULTURE IN ONLINE NEWS IMAGES ON  
MEMORY AND ATTRIBUTION ASSESSMENT OF  
SUBSEQUENT TEXT

By

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Dissertation submitted to the Faculty of the Graduate School of the  
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2013

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2013



## Dedication

To my dear parents  
Junqiao and Shuli  
with love

献给最亲爱的军桥和淑莉

## Acknowledgements

This dissertation would not have been possible without the help of so many people in so many ways. I would never reach the heights or explored the depths without the help, support, trust, guidance and efforts of a lot of people.

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# Chapter 1: The Effect of Emotion and Culture on Memory and Attribution Assessment of News

This dissertation is an experiment that explores the effect of culturally salient and emotion-laden news images on memory and the assessment of news texts dealing with issues topical to the two cultures being examined. Its theoretical framework draws upon two intellectual traditions—information processing models and cross-cultural psychology theories.

This study treats the processing of image and text as discrete: that is, they cannot be processed simultaneously (Paivio 1989), even though one may affect the other. Unlike previous studies which investigated how these two modes of communication could complement or impede each other when presented simultaneously, sometimes called “redundancy” (i.e. Paivio 1989, Lang 1995, Kalyuga, Chandler et al. 1999, Mayer, Heiser et al. 2001), this study looks for a “carry-over” effect of a news image on text. This inquiry is particularly relevant to current “new” technologies for online news presentation, which very often start off with one or more news photos followed by and elaborated with news text. This is not a merely technical artifact, but may represent a “genre,” in the sense that the practice has migrated from its origins in obsoleting paper newspapers to the interface of virtually all the so-called “new technologies.” That is,

when a user clicks through on the heading or picture on a site's main page, a large image followed by the story's text are likely to appear.<sup>2</sup>

When investigating the effects of news images on text, two factors about the images are examined in particular; emotional valence and culture. Following the well-studied notion of "emotion-laden" news images (i.e. Newhagen and Reeves 1992, Lang and Dhillon 1995, Lanzetta, Sullivan et al. 1999), this study also introduces the concept of "culture-laden" news images. While cultural identity of the news reader is an important dimension of the current inquiry about culture in information processing, this dissertation argues that the cultural content in the news images is so deeply embedded and important to functional decision making in real time, it should be considered as a heuristic psychological tool much like emotion. According to a dynamic constructivist view of culture, attributes of an image can evoke a particular cultural frame of mind with the capacity to affect a user's processing of adjacent information (see Hong, Morris et al. 2000). If so, the two, emotion and culture, may jointly interact to affect important outcomes in a user's memory and content assessment early, very fast, and below conscious awareness.

This chapter aims to provide an overview of the role of emotional valence and culture in information processing. While a significant body of knowledge is available regarding the effect of emotion on information processing and its cognition, little has been done to systematically study these two important and, to a great extent, inseparable concepts together in the context of news processing.

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<sup>2</sup> While beyond the scope of this study, "new technologies" have come to dominate the news media ecology. The time may have come to consider such formats as more than artifacts of older presentational forms and to think of them as unique "genre" and to consider what special attraction they have.



It is important to point out that studying culture in news information processing cannot be more relevant today (Geradin and Luff, McAnany and Wilkinson 1996, McQuail and Suine 1998, Sinclair 1999, Page and Crawley 2000). The revolution in communication technology affords the possibility for unprecedented immediate, direct informational communication on a global scale across almost all geographic regions and cultures in real time (Muller and Kappas 2011). This level of global communication is reflected in day-to-day increasingly complex and culturally diverse media content. A macro-level analysis of culture in today's landscape is important in revealing what global news consumers read and watch, yet saying that and not looking at the underlying process does not help us much to understand how they do it. This study explores the role of culture in information processing at an individual psychological level. It calls for attention to a "cultural heuristics," a mental shortcut primed by cultural cues, or narratives, in the media stimuli and/or determined by one's cultural identity<sup>3</sup>. People depend on a limited number of heuristic principles to reduce the complex task of assessing and predicting values to some much simpler selection operations (Kahneman, Pau et al. 1982). This study argues that news readers' limited cognitive ability in the real time and the need for efficiency compel them to utilize the news images as steering mechanism for the text reading (Mondak 1993). This study focuses particularly on two elements in the news images, culture and emotion, which could prompt certain heuristic processing.

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<sup>3</sup> While this study looks specifically at European American and Chinese cultures, the diversity of cross-cultural dissemination of news begs for studies in other cultures.

This chapter first discusses the relationship between text and image processing. It then examines how emotion and culture affect the information processing at a psychological level with a focus on memory and attribution.

### *Text and Image Processing*

It is important to note that image processing and text processing are two unique tasks. The dual coding perspective proposed by Paivio (1989) and work supporting it since its publication show that text and image are processed in different brain centers, and that one takes place at the exclusion of the other. While this fact is not obvious, nor are users aware it is going on, it may have important implications to user constructed “meaning.” This is especially important in the study of news messages, where graphic images are frequently placed to call user attention and then to draw them to a “story” in the hope that the user will continue to examine the accompanying text. In most mainstream online news outlets nowadays, it is the norm that news stories start with a large news photo, which can be clicked open as a slideshow, and then the news text follows.

While early work in the so-called parallel distribution processing model (PDP) of human cognition (Rumelhart and McClelland 1986) has gained the status of the dominant paradigm in the information processing paradigm, image and text are an exception. PDP postulates that information is encoded into the memory system in a non-linear manner unlike like earlier models, and it is distributed and inputted through interactions of large numbers of schema through the brains. However, this study argues that image processing and text processing might be an exception, especially when one precedes the other in the

presentation. In the online news interfaces where the image-before-text layout prevails, it is reasonable to assume that readers process images prior to text in a given news story. This does not rule out the possibility of an iterative process, where users move back and forth from image to text, but it is important to note that the process is fundamentally linear.

Figures 1 and 2 taken from The New York Times content illustrate the point.

**Figure 1. A “Negative” Image with Clear Cultural Cues Preceding News Text.**  
(Barnard and Rudoren 2013)



Oren Ziv/Getty Images

A post office worker showed an Israeli child how to wear a gas mask on Thursday at a mall in the Pisgat Ze'ev area of East Jerusalem. [More Photos »](#)

By ANNE BARNARD and JODI RUDOREN  
Published: January 31, 2013

BEIRUT, Lebanon — Tensions over the Israeli airstrike on Syrian territory appeared to increase on Thursday as [Syria](#) delivered a letter to the United Nations declaring its right to self-defense and [Israel's](#) action was condemned not only by longstanding enemies, including [Iran](#) and [Hezbollah](#), but also by [Russia](#).

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Figure 1. Screen shot of Barnard and Rudoren (2013)'s New York Times article *Syria Says It Has Right to Counterattack Israel*. Photo taken by Oren Ziv.

**Figure 2. A “Positive” Image Prominently Showing Cultural Cues Preceding the Story Text**  
(Paulson 2013)



Gregorio Borgia/Associated Press

Cardinal Timothy M. Dolan, the archbishop of New York, in Rome last fall. The cardinal can work crowds like a gifted politician.

By MICHAEL PAULSON  
Published: March 8, 2013

VATICAN CITY — He keeps a set of vestments here, at the American seminary, so he does not have to lug the red robes back and forth to New York. He is a practiced frequent flier; last fall, he flew a round trip in a day, borrowing a billionaire’s jet so he could preside at a dinner in Manhattan without missing a meeting in Rome.

#### Related

[Saying Mass at Vatican, Dolan Urges Catholics to Look Beyond the](#)

And he keeps careful tabs on both cities — last weekend, in Rome to bid farewell to one pope and help choose

- FACEBOOK
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Figure 2. Screen shot of Paulson (2013)’s New York Times article *Pope Material or Not, a Charming, Cheerful Cardinal Gains Notice in Rome*. Photo taken by Gregorio Borgia.

These two examples are typical of the layout of today’s online news. The layout practice of placing a large compelling image over text in online news media is especially prevalent for story presentation displayed after the user clicks through on a headline

displayed on the main page. It can be argued that there are both strong emotional and cultural cues in both images, and they beg for a closer examination of what effect they might have on text processing and the “meaning” the user takes away from the story texts.

In the first example seeing a child being fitted out with a gas mask in his classroom has to elicit negative emotion in the user. It harks back to the day of the Cold War when American school children were drilled on how to hide under their desks in case of a nuclear attack. There are also strong cues in the dress of the adults in the image that make it that the drill is most likely taking place in Israel.

In the second example, the wide smile on the mother’s face and the kissing of the baby unmistakably evoke positive emotion in most people. Further cultural information is suggested by the three people in the image. The cleric is wearing Christian vestments typical of Western European and American Christianity.

The previous work in the image-processing relationship does provide some insight into how news consumers process news images along with text, but it frequently assumes the two are taking place simultaneously (i.e. Lang 1995), and thus does not address how the text-after-image layout of news online today could affect the way the news text is “read” and what “meaning” might be constructed in the mind of the user. The current study goes beyond the basic question posed by “redundancy” studies, which mostly check to see if the image in some way “helps” or “impedes” text processing. It looks at the text processes subsequent of image processing at a much more nuanced level.

## Redundancy Theory and Dual Coding Theory.

Substantial work in *redundancy theory* deals with how content from more than one modality could help or impede how well people can store and recall information. In the face of the increasing complexity of media content, the issue only becomes more salient. Lang (1995) investigated the effect of presenting “identical” or “similar” content on memory and found that single-channel messages require the least capacity, whereas multi-channel conflicting messages consume and require the most capacity. While multiple-modal presentations are intuitively “better” than information presentations in only one form, studies such as this raise more questions than they answer. For instance, other studies suggest that the increase in cognitive load due to a “redundancy effect” interferes with learning (Kalyuga, Chandler et al. 1998, Kalyuga, Chandler et al. 1999). While latency to respond to a task is unequivocally recognized as a measure of mental effort in the information-processing paradigm, what is less clear is how that effort is being used. For instance, a longer processing time might be interpreted as “bad” in the sense the user is having difficulty making sense of a stimulus. On the other hand the increased processing also might be conceptualized as “better” in the sense that users more engaged in the stimulus and are using the time to construct more elaborate schema for it (Bower and Karlin 1974).

Clark and Paivio (1991) posit that users build both visual and verbal mental representations when processing multi-modal stimuli, and build neural connections between them. These referential connections provide a “link” between the two schemas, and while dual coding may require more time and effort, the payoff is enhanced outcomes for memory and comprehension. Based on this premise, Richard and Anderson

(1991) found that the words-with-pictures experiment group outperformed the words-before-pictures group on tests of creative problem solving. While this study does not look into the carry-over effect of pictures on words, but it does show something really critical to the current study: presenting information in one form prior to the other makes a difference in memory and performance. This to a certain extent lends support to the current inquiries.

It is, however, critical to understand that nearly all research in this area makes the assumption that the information in one modality can somehow be replicated to be “just the same as” information in another mode. Bolter and Grusin (1999) make a critical theoretical point when they point out that moving “content” from one modality to another involves a process they call *remediation*. They challenge the claim that some transcendent “meaning,” is imbedded in a message’s representation on one interface that can be reproduced veridically to a message on another interface. This makes the idea of “one is the same as the other” both ontologically and epistemologically intractable, that is, “content,” which resides in both a message and a medium may be remediated to have related “meanings,” to the original, but is never “the same as” the other. This idea harks back to McLuhan’s mantra from the 1960’s the “the medium is the message.(McLuhan and Powers 1989)”<sup>4</sup>

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<sup>4</sup> This discussion has its analog in the very foundations of traditional journalism, where either implicitly or explicitly the assumption is made that there is some “truth,” and that journalistic “stories” are rough representation of it.

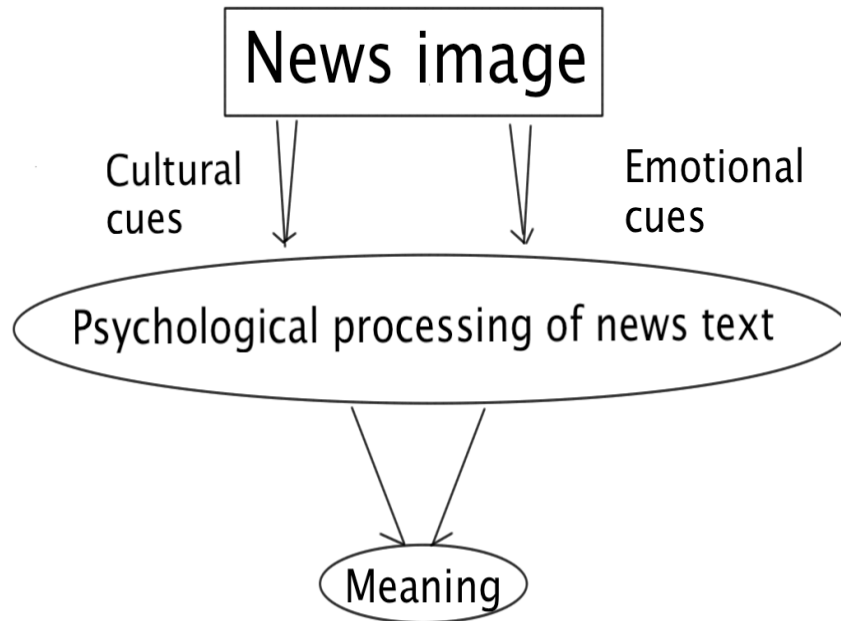
Parallel Distributed Processing Model (PDP).

Rumelhart and McClelland (1986)'s work into the PDP, or "parallel distributed processing" model of human cognition postulates that information is not encoded into the memory system in a step-to-step manner like some earlier models have proposed, but instead, information is distributed and inputted through the interactions into large numbers of schema throughout the brains. However, Pavio's work represents an important exception to the PDP model. Image processing takes place in a large portion of the right anterior cortex, whereas text processing takes place in frontal areas of the left hemisphere of the cortex and is much more linear than is the case for images. This again indicates that cross-modal equivalency (image to text) is, if nothing else, physiologically unlikely. How one influences the other, especially in a sequential order in the online news presentations has been treated as a mysterious "black box"(Geiger and Newhagen 1993). To peer into the "black box," this study bases its further queries into the role of emotion and culture on information processing on the following model (see Figure 3).

The model treats the image and text as two independent non-equivalent carriers of news information. Instead of creating possible "redundancy effects," when appearing before the news text, the news image can shape readers' processing of the subsequent text with its strong emotional and cultural signals. It is undeniable that news images present informational cues of many kinds. However, this study only focuses two of types of non-textual information in the news image: emotion and culture.



**Figure 3. Online News Information Processing**



*Image Emotion on Text Memory and Assessment*

A news image has the potential to affect the way the news text below it is processed in a number of ways. One of the entry points into the current investigation is emotion. Emotion is selected as a focus primarily for two reasons.

First, humans assign objects emotion very quickly (perhaps in less than 100 milliseconds), at a very early stage of information processing, and below conscious awareness (see Frijda 1988, Newell 1990). Emotion is a fundamental element of information processing. The idea of “news” itself is frequently defined as novel, unusual, or deviant, implying messages to be loaded with emotion-laden material. In fact, most cutting edge information processing models depict emotion as the force controlling the

allocation of attentional resources, where higher order cognitive resources only emerge after that process has taken place.

Secondly, according to Anderson's (1983) spreading activation model of memory, when one node in a schematic network is activated, other nodes connected to it will also become relatively active according to the strength of their connection. This activation is often stimulated by the primary, basic, and rapid emotional appraisal which results in preliminary categorization as either negative or positive (Frijda 1988). When considering the case of news processing on the Internet, where a fairly large image appears at the top of the screen first, the emotional impact of the news image on the subsequent processing of the text cannot and should not be trivialized.

#### Defining Emotion.

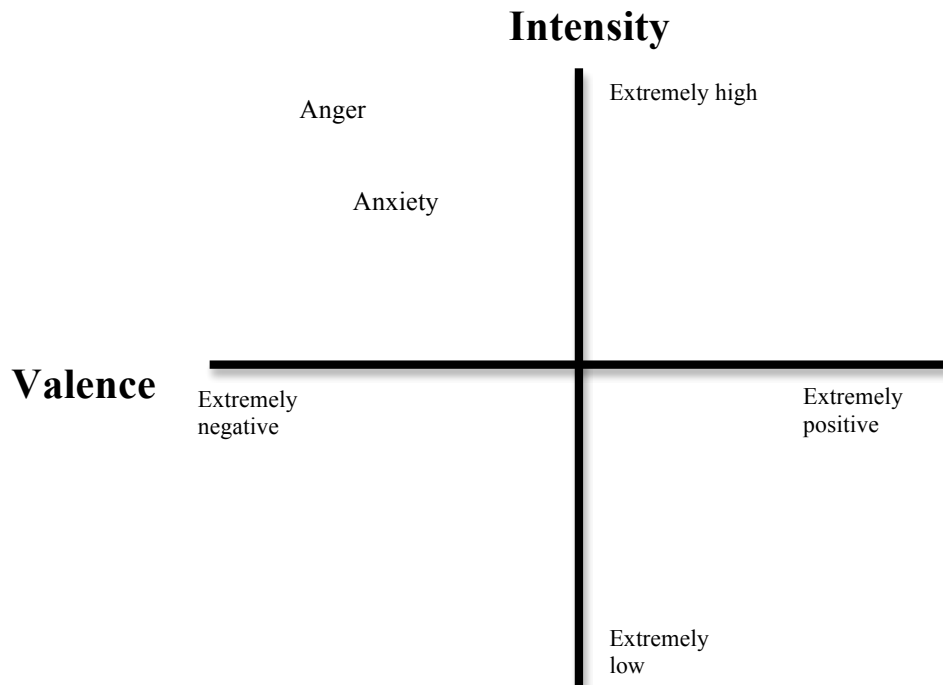
Emotion can be described as discrete psychophysiological states, such as anger or fear, but it can also be displayed as a dimensional construct, where hedonic valence and intensity are the two primary dimensions. The two views are not, however, mutually exclusive. At least the most primary categorical emotions can usually be mapped onto the two dimensional space.

This dimensional theoretical perspective conceptualizes emotion as a targeted, relatively fleeting, affectively-valenced response emerging from basic motivational processes (Lang 1995, Lang and Bradley 2008, Larsen, Berntson et al. 2008, Bolls 2010). This view implies that there is not a list of clearly separated states, but infinite variations based on three basic dimensions. The three defining dimensions are valence, ranging from highly positive/pleasurable states to highly negative/aversive states; arousal, indicating the intensity of the affective experience; and potency, also referred to as

dominance, which is often defined as control (Mehrabian and Russell 1974, Lang 1988, Lang 1995).

Among these three components, the previous research has primarily been on valence and intensity. Figure 4 illustrates the relationship between the two major components of the dimensional approach, and demonstrates this model's intuitive value by arraying to primary emotions on it.

**Figure 4. Defining Emotion as Valence and Intensity**



Valence and intensity have long been recognized as the two organizing dimensions of responses to stimuli (see Dickinson and Dearing 1979). Valence in particular largely determines the most basic of all behavioral outcomes; to approach and avoid a novel or unexpected object in the environment. From a functionalist view,

emotions help an organism make functional decisions that will enhance its chances for survival.

#### Emotional Valence as a Heuristic For Making Sense of The World.

Psychological heuristics are shortcuts that help an organism with limited cognitive resources, such as humans, make survival contingent behavioral decisions based on limited information in real time (see Tversky & Kahneman, 1974). A key value of heuristic processing is that it is fast and does not consume precious cognitive resources needed for other tasks. Much of such processing goes on below conscious awareness (Tversky and Kahneman 1974).

Marr's (1982) three-step model for image processing serves as a good example of processing that goes on at the very outset of visual recognition: The first step is based on a primal sketch of what Gibson (1979) calls the "visual ecology." Heuristics help identify objects and textures to define the shapes into order to construct a complete and continuous three-dimensional map. This process helps individuals identify the novel objects and determine if they are relevant to the probability of survival. Emotional heuristics come into play very early in this process; where the affective system codes them according to how pleasant and or unpleasant they are (Bolls 2010).

This is supported by the Affect-as-information Model (see Rahn 2000). This model proposes that emotional cues from emotions provide experiential information about the nature of an event at the moment (Clore and Huntsinger 2009).

In the case of a news story accompanied by an image, no matter what criteria one might have for thoughtful evaluations of narrative later on at a higher level, processing

begins with a very simple image-based judgment: whether it is good or bad (Reeves and Nass 1996).

#### Emotional Valence Matters: Limited Capacity Model.

The media environment around us is often much more complex than a single image or a scene. If human beings process information in a linear way by matching what they see to memory, as computers do in a list-wise data base search, it may be quite resource-intensive and time-consuming. As Kahneman<sup>5</sup> (1973) and Lang<sup>6</sup> (2000) noted, a person's ability to process information is limited. This could be aptly illustrated by the well-known Invisible Gorilla experiment (Chabris and Simons 1999). Subjects are asked to view a video of two teams, one wearing black shirts and the other wearing white shirts. They are asked to count the number of times people in either black or white shirts pass the ball. With members of both teams running around rapidly and passing the ball frequently, the task is undeniably resource intensive. During the display a person dressed in a gorilla suit enters into the field of view and pounds on his chest, and then leaves the scene. Numerous replications of the experiment show that viewer's counts of ball passes is not that bad, but more than 50 percent report they never saw the gorilla strolling into the middle of the action<sup>7</sup>. The point of the exercise is to show that humans have limited cognitive resources, and when engaged in a mentally challenging and intensive task, can

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<sup>5</sup> Kahneman (1973) in his capacity model argues that there is actually flexibility in attention. We constantly adjust the amount of attention paid to certain things, allocating our attention from one thing to another, depending on our real-time state of arousals.

<sup>6</sup> Human cognitive capacity is a limited resource (see Lang 2000). Processing messages requires mental effort, and people have only a limited (and perhaps fixed) pool of resources.

<sup>7</sup> The Invisible Gorilla-The Selective Attention Test" can be see here:  
[http://www.theinvisiblegorilla.com/gorilla\\_experiment.html](http://www.theinvisiblegorilla.com/gorilla_experiment.html).

effectively become selective of information processing and even “blind” to information deemed not useful to the task at hand (Kahneman 2011).

Due to the limits of cognitive capacity, the encoding of information is selective (Lang 2000). Limited capacity theory proposes that information processing is partially under the control of the characteristics of the message. That is, attention and later memory can be reflexively elicited by meaningful features of the message, such as emotional valence (Reeves, Biocca et al. 1988).

#### Valence and Memory.

Much attention has been given to the relationship between emotional valence and memory in the past few decades (Newhagen and Reeves 1992, Lang and Dhillon 1995, Newhagen 1998, Nabi 2003). The question of whether images that elicit positive rather than negative emotional valence are more memorable has puzzled media researchers, considering the results have not always been consistent. Some researchers found that news images that were highly negative and highly intense, generally depicting death and human sufferings, were more memorable than positive images of the same event (see Newhagen and Reeves 1992). However, other studies have shown positive emotions can in fact enhance memory under certain circumstances.

The issue becomes even more complex when and where the information for the memory task is taken into account. Epistemological issues of how memory is tested also appear to make a difference, where self report may not be appropriate to measuring phenomena taking place below conscious awareness. For instance, when studying compelling negative images in TV news, Newhagen and Reeves (1992) found that memory was not as good for material that preceded the negative images than it was for

positive or neutral images, but only when subject latency to response measures were examined. Considering that memory for visual material presented after compelling negative images was superior suggests that the effects of the negative images had both a proactive and retroactive effect. This could simply because increased arousal caused by the negative information was consequential to memory (Reeves and Nass 1996).

Nevertheless, a counter argument is that being in positive emotional states induces cognitive ease and frees up more cognitive resources that facilitate better performances in memorization (see Kahneman 2011). It is also found that positive emotion promotes “broadening” of attention and memory (i.e. Forgas, Laham et al. 2005, Levine and Edelstein 2009). In any case, it is clear that care must be taken when selecting when and how memory is measured.

While emotional valence on memory is a well-developed topic of research, some areas still remain largely unknown. For instance, though negative images facilitate memorization of subsequent visual stimuli, whether negative images enhance the memory of factual elaboration in news text can be a fundamentally different inquiry, especially given the fact that text processing and visual processing take place in separate parts of the brain and are two incomparable processes (Rumelhart, Hinton et al. 1986). This is where this study can possibly fill in a gap. This study first asks:

***Research Question 1a:*** *Do images containing elements that evoke emotion in the user affect the memory of the subsequent news text?*

### Valence and Memory of Peripheral and Central Information.

Emotional valence is not only found to have the power to affect people's overall memory of an event. More interestingly, it also can determine the breadth of memory. Researchers on emotion and memory made a distinction between peripheral and central information to systematically study whether emotional valence directs people's focus on one over the other (e.g. Safer, Christianson et al. 1998, Peterson and Whalen 2001, Reisberg and Heuer 2004). They found that in intensive positive emotional states, where information density is very high, people tend to remember peripheral information well (i.e. Fredrickson 2001, Rowe, Hirsh et al. 2007).

One of the widely-used approaches to defining peripheral and central information of a given emotional story/event is to base the distinction on whether the information is *conceptually integral* to understanding the event/story (Heuer and Reisberg 1990, Adolphs, Denburg et al. 2001, Peterson and Whalen 2001). In other words, central information should be the gist of the story that cannot be changed without changing the basic nature of its basic meaning of the emotional story. Peripheral information, on the other hand, serves to enrich rather than to define the story. If the peripheral information is taken out, the main story line still remains the same.

A growing body of research on emotion and memory of peripheral and central information has found that negative emotion very often leads to memory narrowing and positive emotion leads to broadening (e.g. Levine and Bluck 2004, Kensinger, Schacter et al. 2007b). That is, when experiencing negative emotions, people tend to remember the central features of an event better than the peripheral details, whereas positive emotions allow people to capture and store more peripheral information in their memory. These



findings are more consistent when the emotions are intensive (high-arousal) (Fredrickson 2001).

A possible explanation for this is that emotions inform an individual of the nature of a given situation. While negative emotions signal threat or danger thus prompting the individual to focus on avoiding or escape, positive emotions suggest a safe environment, which allows individuals to adopt an more explorative approach to information processing which enables them to take in a broader range of information (Schwartz 1990).

An abundance of studies have shown consistent findings regarding the influence of emotional states on the breadth of attention and memory. For instance, Rowe et al. (Rowe, Hirsh et al. 2007) found that positive emotions reduce one's ability to selectively respond to a centrally presented target stimulus surrounded by peripheral objects. This finding suggests that positive emotions make it more difficult to disregard the supporting peripheral information that was presented along with the central object.

More interesting, high-arousal positive emotion states lead to increased breadth of conceptual attention. (Friedman and Förster 2010). For instance, when experiencing positive emotions, people tend to adopt a relatively inclusive categorization of weak or non-traditional exemplars (such as camel being categorized as a vehicle) (see Baas, De Dreu et al. 2008). This suggests that positive emotions can even modify what people perceive as conceptually relevant.

These findings indicate two dimensions of the influence of emotion on memory specificity/breadth. On the one hand, emotion valence is found to be influential on the voluntary focus of attention and recall. That is, one actually "sees" more information,

when experiencing positive emotions or the information is presented in such an emotional setting. On the other hand, emotional valence may also affect the conceptual distinction of central and peripheral. When people experience a positive emotional state, information, which might be otherwise seen as peripheral, may be considered as relevant and central.

In the current project, considering the emotional elements often carried in the news images, it would be meaningful to ask how the emotions elicited by the news images could shape readers' memory of the report of the news events described in the text. This would be an interesting application of theories on a relatively practical question about news processing. It could possibly be one of the first few researches that look at the impact of emotion on memory specificity of news text.

In order to study breadth of memory, this study defines peripheral and central news information based on its conceptual importance, as used by Heuer & Reisberg (1990) and many theorists (Heuer and Reisberg 1990, Adolphs, Denburg et al. 2001, Peterson and Whalen 2001). In the news context, it defines "central information" as the conceptually integral information that is critical in helping readers understand what happened in a news event. The skeleton structure of a story can usually boil down to the five Ws and one H<sup>8</sup> in news reporting, whereas "peripheral information" is subsidiary background information that is not always necessary for understanding what happened in the news event. Given this, this dissertation proposes a follow-up question on RQ1a by asking:

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<sup>8</sup> Five Ws: who, what, when, where, and why; H: how

***Research Question 1b:*** *Do images containing elements that elicit emotion in the user affect the memory of the peripheral and central information in the following news text?*

An abundance of literature in cross-cultural psychology suggests that emotion is not the only strong factor that shapes one's memory. Culture can also play a decisive role. This will be elaborated in detailed shortly in a later section.

Attribution.

This study also looks at the assessment of news text that is preceded by images containing emotion and culture cues. More specifically, this study explores how emotional valence is associated with the types of attributions of responsibility adopted by the news readers. Stuart Hall (1978) made the point while a message maker may embed specific meaning to their work, once the message enters into a communication technology, “meaning” becomes free floating, and on reception, the message user may or may not adopt the maker’s intended meaning.

Attribution falls within the scope of this research project for the following reasons. First, causal ascriptions media users adopt to generate attributions of responsibility regarding a particular problematic news topic guide their preferences for judgments and future actions (Weiner 1986, Weiner 1995). Almost all public opinion stems from attribution assessments at an individual level. Attribution judgment can be quite consequential, especially when it comes to certain news topics, such as presidential elections, legislation, and foreign policies. Second, attribution can possibly come hand in hand with emotional judgments at an early stage of information processing. It is of primary importance to figure out the causal relationships between elements of a novel incident in order to generate functional behaviors that will help the organism survive into the next problem space. Therefore, assigning attribution very early is functionally appropriate as well. Thirdly, most existing research on the relation between emotion and attribution has adopted a discrete rather than a dimensional approach based solely on participant report to describing emotion, which may have limited the applicability of their

results to a wider range of emotional states. (Betancourt and Blair 1992, Major 2011, Palazzolo and Roberto 2011).

It can't be denied that one of the reasons for focusing on attribution in this project is to directly compare Western European and East Asian attribution styles. While a number of studies have found interesting differences between attribution styles between the two cultural groups (i.e. Peng and Nisbett 1999, Masuda and Nisbett 2001), this comparison in the news context has been remarkably overlooked. At the same time this comparison sheds light on the assessment process generally and, to the degree it does, adds to our knowledge of the linkage between image and text content and meaning creation regardless of the comparative structure of the model to be tested.

#### Attribution-Emotion-Action Model.

Attribution styles here are defined as “how the social perceiver uses information to arrive at causal explanations for events (Fiske and Taylor 1984, p.23). According to Weiner (1980)’s attribution-emotion-action model, the relationship between attribution, emotion and preferences can be described in four steps: 1) an event with a given outcome takes place; 2) attributions are made based on a causal assumption; 3) these attributions result in a matching emotional state; and 4) these emotions (discrete emotions) guide individuals’ preferences. The underlying assumption of this model is that people make causal judgments before they experience emotions. While this might be supported by emotion theorists such as Lazarus (1991), another school of researchers argue that cognition is not a necessary precondition for affective arousal (Zajonc 1984). Affective reactions can be established without apparent participation of higher-level appraisals. In some cases, emotions are elicited automatically without appraisals (Lanzetta and Orr

1980, Laird, Wegener et al. 1982, Damasio 1999). With this said, this study asks what will happen if the first two elements (emotion and attribution) of the model switch places and how emotional valence could possibly affect causal attributions? Thus, a research questions is proposed as follows:

***Research Question 2:*** *Do images containing elements that elicit emotion in the user affect the attribution assessment of the following text?*

### Culture on Memory and Content Assessment

The other key theoretical component of news information processing in this study is culture. In social psychology, culture is defined as “a relatively organized system of shared meanings” given to events (Rohner 1984, Smith and Bond 1998, p.39).

Levi-Strauss and others (1976) recognized that culture is in itself a narrative to transmit norms and codes. Murray (1997) provides a good overview of how the work of Vladimir Propp demonstrated how deeply structural meanings can be embedded in cultural narratives in his work on the content of Russian fairy tales. Propp broke up fairy tales into sections and was able to define the tales into series of sequences that occurred within the genre. Similarly, Dawkins (1976) coined the word *meme* to represent a symbolic element in a cultural narrative or “program” that work in much the same way genes affect the biological character of an organism. Examples of memes according to Dawkins included catch phrases, fashion, and the technology of building arches etc. Carey (1983) and his students have extended that work to occasionally going so far as to assert that culture is in itself communication. Another example is Newell’s (1990) multi-level information processing model. In this model, culture is seen as an independent level of analysis, which lies above the psychological level of information processing.

However, much of the work in the symbolic nature of cultural scripts violates the so-called *ecological fallacy*, that is, building theory at one level of analysis, usually a macro-analytic level such as culture, and then applying it to individual behaviors, or at a psychological level. Langbein and Lichtman (1978), for instance, point out how the practice can lead to false inference, such as confusing causes and effects. It is important to understand that this research is not intended as a critique of the work cited above. The

point here is not to challenge the notion that culture laden with symbolic meanings is critical to communication. Rather, what this study does hope to accomplish is to examine the manner in which the *individual* processes and makes sense of those meanings as a psychological process (Geiger and Newhagen 1993).

The distinction between studying culture in news processing at a psychological versus societal level is important and meaningful. On one hand, it proposes a new approach to studying culture in the field of journalism, complementing the macro-level analysis of culture usually seen as a social construct. On the other hand, if the effect of culture on memory and assessment of news is verified, it opens the door to research on culture's impact on all other dimensions of news information processing, such as motivation, decision making, and even behavioral change.

The proposition about culture as an important psychological element in the information-processing paradigm in fact comes from a body of decades of research. While it is an idea well-accepted in the field of cross-cultural psychology (see Chiu 1972, Kitayama 1992, Morris and Peng 1994, Masuda and Nisbett 2001, Yuan 2009), it is barely touched upon in the area of journalism studies. The increasingly complex advances in media technology at a global level have presented media researchers with an entirely new set of questions about media effects (Newhagen 1998). This study tries to take advantage of the rich literature on cross-cultural psychology to address the question "Do news consumers from different cultures adopt distinct cultural mindset which affects their memory and assessment of news content?"

This study looks at culture at a very basic psychological level of human communication. It takes the position that symbols generated from culturally salient media



content are a critical element in the information processing paradigm, just as emotion is (see Chiu 1972, Kitayama 1992, Morris and Peng 1994, Masuda and Nisbett 2001, Yuan 2009). Similar to emotion, culture can also serve as a cognitive heuristic mechanism. When activated or adopted, it helps shape critical mental outcomes such as memory and assessment of media content.

The question as to whether news users employ cultural heuristics which affect their memory of and assessment for culture-laden news content can be addressed very differently by two major schools of cross-cultural psychologists.

#### Dimensional Meets Dynamic Constructive Approach.

The dimensional approach to studying cross-cultural psychology is a traditional method which is based on the premise that each individual tends to have a core culture identity and this identity remains comparatively stable (i.e. Norenzayan, Smith et al. 2002, Nisbett and Miyamoto 2005). Most studies in this area of research adopted this approach and yielded significant findings about psychological differences between cultures (i.e. Cousins 1989, Norenzayan, Smith et al. 2002, Yuan 2009).

However, researchers who hold a dynamic constructivist view believe that the concept of culture can be flexible and dynamic, at least for individuals who are bicultural or multicultural (i.e. Hong, Morris et al. 2000, Masuda and Nisbett 2006). They believe that all individuals, especially those who are bicultural and multicultural, are capable of switching between cultural frames, which they call “frame switching” (p. 709). Their work is supported by studies using the priming techniques. For instance, Hong et al. (2000) found that both Western Europeans and East Asians, when primed with Chinese

icons such as national flags and historical sites, are more likely to attribute cause to the external environmental factors, which is an East Asian attribution tendency. By contrast, people who were exposed to Western icons were more likely to attribute cause to the salient actor.

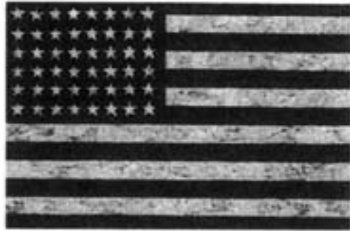
This difference in attribution was usually found across culture between Asians and Western Europeans<sup>9</sup>. However, by using priming techniques, researchers were able to find that the differences in attribution styles existed disregarding their own cultural identities, as long the “cultural frame” was primed into the individuals. Simply put, unlike the dimensional approach, the dynamic constructivist view believes that individuals are able to shift between interpretive frames rooted in different cultures in response to the given culture-specific stimuli. The following figure (Figure 5) shows a set of image primers used in Hong and Morris (2000)’ work. Hong et al believed that these cultural symbols could serve to activate cultural “frame switch.”

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<sup>9</sup> It is found in Morris and Peng (1994) that when a social event happens, Westerners perceived more influence of internal factors, whereas Eastern Asians perceived more external influence on the actor in the social event.

Figure 5. Cultural Icons Used Triggers for “Frame Switch”

## American Primes



## Chinese Primes



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Culturally salient icons carry around so many diverse elements of cultural knowledge and memories (Betsky 1997). By using this approach, Masuda and Nisbett (2006) found that even showing street scenes of different cultures (Japanese versus US) was enough to prime the participants into adopting a specific cultural mindset (See the image examples they used in Figure 6)

**Figure 6. Street Scene Stimulus in American and Japanese Settings**  
(A and B are Japanese; C and D are American)

A



B



C



D



They found that when viewing Japanese street scenes, both Americans and Japanese demonstrated more Asian cognitive patterns. This study shows that when viewing the Japanese scenery, both Japanese and American irrespective of cultural backgrounds detected more changes in the field, whereas when viewing the American scenery both groups detected more changes in the focal objects. The cultural differences were only noticeable enough with the culturally neutral scenery.

A similar example is Nisbett and Miyamoto's (2005) study, which found that regardless of the cultural background of the participants, those who were exposed to the Japanese perceptual environment (a Japanese street view) detected more changes in the peripheral background than those who viewed an American street view.

If these images can cause viewers to switch cultural frames, then what would culturally salient news images do to news readers' information processing? Will news images showing Asian faces channel readers to a more Eastern way of thinking as compared to white European Americans? This study is designed to address that question.

When considering the two approaches to studying cross-cultural psychology, on the surface, these two paradigms seem to be incompatible. However, this study posits that they are in fact not competing, but rather are trying to explain a communication process from two perspectives. The dimensional approach focuses more on the content-receivers' end of communication, arguing people from different cultures apply different cultural theories on information processing. By contrast, the dynamic constructivist approach places more emphasis on the cultural attributes of content itself, saying that stimuli laden with cultural signals can put people into a corresponding cultural mindset, temporarily overwriting/suppressing their core cultural identity. Research from two traditions complement each other and draw a full picture of the information processing between cultural groups. This dissertation aims to incorporate both approaches and attempts to test them together in the news context.

Notwithstanding the differences in the theoretical standpoint, European Americans and East Asians, the chosen cultural groups of this study are found to process information very differently at a psychological level when processing non-media stimuli. These differences hold true, whether they are a result of the stable core cultural identity (dimensional view) or an outcome of the cultural theory one is "primed" into by culture-laden information (dynamic constructivist view). Recent research has indicated that the

cultural differences lead to both chronic as well as temporary shifts in cognitive processes. These differences are reviewed in detail as follows.

#### Differences in Cognitive Processing Between Europeans and Asians: Holistic Versus Analytical.

The literature on cross-cultural studies has abundant evidence for differences in cognition between people from different cultures. The current study reviews only those found between Asians and Europeans Americans. Nisbett & Peng (2001) gave a comprehensive look at culture and systems of thought. On the basis of Nisbett and Peng's writing, Choi, Koo et al (2007) also commented that the most noticeable difference in the cognition between the East and the West is *analytical* versus *holistic* thinking. Four major aspects in the cognitive process reflect this fundamental distinction:

1) Memory of the field versus focal object: Chinese Americans tended to pay attention and emphasize all aspects of a story, whereas European Americans were more likely to emphasize single aspects or the focal point of the given information (see Nisbett and Miyamoto 2005, Kitayama, Mesquita et al. 2006). In other words, Westerners tend to engage in context-independent processing by focusing on a salient object independently of its context, whereas Asians tend to adopt a holistic perceptual process by considering not only the salient object but also the contextual elements (Nisbett and Miyamoto 2005).

2) Attribution differences: instantiated as situational versus dispositional, which refers to the phenomenon that when a social event happens, Westerners perceived more influence of internal factors of the main figures such as personality, whereas Eastern Asians perceived more external influence on the actor in the social event (See Morris and

Peng 1994). The former is often called the dispositional attribution style, whereas the latter is named the situational attribution style.

3) Experience-based versus logical reasoning: East Asians are found to rely more on prior beliefs and experiences when evaluating the convincingness of formal arguments than do Americans (Nisbett, Peng et al. 2001). When presented with non-traditional/typical but scientifically sound argument about an object, Asians were found to be more reliant on previous experience and intuition, disregarding the reasoning in the argument. However, Americans tend to base their judgment on logical reasoning rather than experience (Norenzayan, Smith et al. 2002)<sup>10</sup>.

4) And reaction to contradictions: This indicates that the Chinese individuals have little discomfort with contradictions and even show a tendency to embrace and appreciate them, whereas Americans tend to be less comfortable with ambiguous conditions and tend to choose a side of a conflict to reach clarity and certainty. When presented with counter arguments, the Chinese participants' view about the given topic got "neutralized" to some extent, whereas American participants' view became polarized (See Peng and Nisbett 1999, Nisbett 2003).

Among the four aspects, this study focuses only on the first two aspects, as they are most relevant to the news context.

It is widely recognized that East Asians have a holistic view that things are interconnected, whereas the Westerners believe that the world is composed of

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<sup>10</sup> For instance, in one of Norenzayan et al's experiments, based on the premise "all birds have ulnar artery," two conclusions were given to American and Korean participants: 1) therefore all eagles have ulnar artery; 2) therefore all penguins have ulnar artery. It found that Koreans participants were more comfortable with the first statement, as eagles were more typical birds whereas penguins were atypical birds. However, American participants showed significantly less typicality-based thinking than the Korean participants.

independent objects (e.g. Markus and Kitayama 1991, Masuda and Nisbett 2001, Choi, Koo et al. 2007). These differences can be traced back to the ancient Greece and China, where the Greeks viewed the locus of power as lying in the individual. The ancient Chinese sense of personal agency was not socially independent. It is more a sense of mutual social obligation or collective agency, such the emphasis on collective agency resulted in the Chinese valuing in-group harmony and avoiding conflicts or debates (Nisbett, Peng et al. 2001).

Intellectual traditions in ancient Greece emphasized analytic thought, which can be defined as un-linking the object from its context. In the context of the discussion of so-called *new media*, Phaedrus is frequently cited as a pivotal moment in the Western intellectual tradition favoring linear texts (Plato 1993). It is a tendency to focus on the characteristics of an object and assign it to a category according, as a preference for relying on rules about the categories to explain and predict object's behavior (Masuda and Nisbett 2001, Nisbett, Peng et al. 2001). Conversely, the intellectual traditions in ancient China, as reflected in Taoism, Buddhism and Confucianism, are more holistic in character. Holistic thought is associative, and considers objects of interest in the context of its surroundings which does not always follows strict linear logical reasoning (Nisbett, Peng et al. 2001). Nisbett (2001) defined holistic thought as involving an orientation to the context or field as a whole, including attention to relationships between a focal object and the context, and a preference for explaining and predicting events on the basis of their complex interactions.

“Holistic” and “analytic” are concepts that have been used to loosely group many specific types of differences between the Western and Eastern thinking. This study



focuses two specific aspects of interest, which are 1) focus of memory: field versus parts; and 2) Attribution differences: situational versus dispositional.

*Focus of memory: field versus parts.*

Eastern Asians and Western Europeans are found to attend to different aspects of their environments. This assumption is supported by empirical evidence. Early in Abel and Hsu's (1949) study, researchers found that Chinese Americans tended to emphasize all aspects of a story, whereas European Americans were more likely to emphasize the focal parts or objects of the given information, that is, Americans attend to and memorize information more selectively. This finding was later supported by other experiments. Masuda and Nisbett (2001) in a fish aquarium experiments found that the Japanese were more likely to bind object and field in memory and to be influenced by the manipulation of the backgrounds than were Americans. In the meantime, Japanese were able to recall much more detail information about the animals and rocks in the peripheral background, but as much information about the focal fish. In another underwater scene experiment, Japanese subjects reported 60% more information about the context than did Americans (Nisbett & Miyamoto, 2005). A related study (Hedden, Ji et al. 2000) demonstrates that Chinese, but not Americans, recalled words better if they had been presented on the background paired with the word originally, indicating that recall of the background served as a retrieval cue for the word for them and the focal information and the context were bonded in memory. These experiments suggest that the non-focal background information for European Americans is seen as critical by the Asian participants.

These studies suggest that Asians perceive and remember contexts and relationships, whereas Westerners are more likely to attend to, perceive and remember the attributes of salient objects and their category memberships (Nisbett and Miyamoto 2005). Americans attend to the details of certain focal objects, whereas Japanese pay attention to the surroundings and the relationship between objects and even remember more about them (Dalton, Beck et al. 1998). Most of the studies use photos of street scenes and animals as stimuli. Whether the differences in attention will still be prominent in the way Westerners and Easterners process media information remains largely unknown. The current study mapped the cultural differences on a psychological level across two major cultural groups onto the media research. More specifically, how this difference in cognitive pattern between two cultures could translate from image to even text processing. This suggests an interesting new area of inquiry, namely, how cultural identity of the reader or the culture-laden images can possibly affect the memory of the reporting of news events.

More specifically, since the difference in cognitive focus on salient focal parts versus context is found to exist mainly in visual stimuli (like street scenes), it remains a question whether this difference also exist in processing text. In order to distinguish between the focal part and field (key information versus contextual information), this study posits that there are two types of information in news text: central information and peripheral information.

As mentioned earlier in the discussion about emotional valence and memory breadth, this study defines “central information” as the news information that is critical in helping readers understand what happened in a news event, such as the five Ws and one

H<sup>11</sup> in news reporting. “Peripheral information” is subsidiary background information that is not always necessary for understanding what happened in the news event. This definition distinguishes between central and peripheral information based on whether the information is a “conceptually integral feature” of a news story. This defining approach is supported by the research of Adolphs et al (2001), Heuer and Reisberg (1990), and Peterson and Whalen (2001).

It is important to point out that “peripheral and central” here are used completely differently from the figurative “central and peripheral” paths of persuasion in Cacioppo and Petty’s Elaboration Likelihood Model (ELM) (1989). In their model, in the processing of persuasive messages, “central” means elements of rational, narrative text, whereas “peripheral” refers to information such as the physical attractiveness of the source. They argue that people switch from central to peripheral information when the cognitive load gets too high. Unlike the ELM, this study defines “central” and “peripheral” more literally based on how the textual information is conceptually important in helping readers understand what happened in the news event.

Given the review of the effect of culture on the focus of memory, this study asks the role of culture in news text processing from both the dimensional and dynamic constructivist views:

***Research Question 3a:*** *Do people from different cultures adopt distinct cultural heuristics, which affect their memory of the central and peripheral information in the text?*

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<sup>11</sup> Five Ws: who, what, when, where, and why; H: how

***Research Question 3b: Do culture-laden news images affect memory for the central or peripheral information in the text?***

*Attribution: situational versus dispositional.*

The other important mental outcome of information processing in this study is attribution. The effect of culture on attribution judgment has drawn researchers' attention for decades. Besides the differences in the focus of memory, researchers also discovered that East Asians and the Westerners tend to make causal relations differently. Morris and Peng (1994) found that the tendency of perceivers to focus on individuals and interpret behavior in terms of their internal dispositions may be more marked in North America than in China.

Morris and Peng (1994) studied the difference between Americans and Chinese in their attribution styles. In their study, they emphasized the terms dispositional attribution. It refers to the explanation of individual behavior as a result caused by internal characteristics that reside within the individual, as opposed to outside (situational) influences that stem from the environment or culture in which that individual is located. In their experiments (Morris and Peng 1994), they found that Americans perceived more influence of internal factors and Chinese perceived more external influence on the actor in a social event (such as the blue fish experiment mentioned earlier). Later they analyzed the news coverage of murders in two countries and found that in the news reports on the same type of murders, American reporters make more association between the crime and the murders' personal traits and Chinese reporters attributed more to situational factors/outside forces. More importantly, on the readers' side, when readers were asked

to predict the likelihood of the murder happening again, Chinese judged it to be significantly less likely to happen than did Americans in hypothetical scenarios where environmental factors were changed. This indicates that to the Chinese readers, the situational factors were perceived more as decisive factors.

Masuda & Nisbett (2001) examined the presence of the fundamental attribution error in Asians and Americans. The fundamental attribution error refers to the tendency to see behavior as a product of the actor's dispositions and to ignore important situational determinants. In other words, it is a tendency of person perceivers to attribute the behavior of others to their personalities and personal traits rather than to situational forces, often even when the latter obviously should be not overlooked. The findings suggest that the correspondence bias appears to be less noticeable in some non-western cultures. Many other similar studies also lend support to the phenomenon that East Asians are inclined to explain the outcome of another person's behavior in terms of situational factors, where as Americans are more likely to explain behavior in terms of presumed internal factors such as personality traits and other corresponding dispositional terms (Miller 1984, Norenzayan, Choi et al. 1999). This adds an interesting layer to the inquiry about the reverse effect of emotion on attribution. It is worth considering if it is possible culture plays an even bigger role in determining what people attribute news events to than does emotion? With this said, another two research questions ask:

***Research Question 4a:*** *Does a news consumer's culture affect attribution assessment of the news event described in the news text?*

***Research Question 4b: Do culture-laden news images affect cultural heuristic processing which affect their attribution assessment of the news event described in the news text?***

Again the two questions approach the role of culture from the dimensional and the dynamic constructivist perspectives respectively.

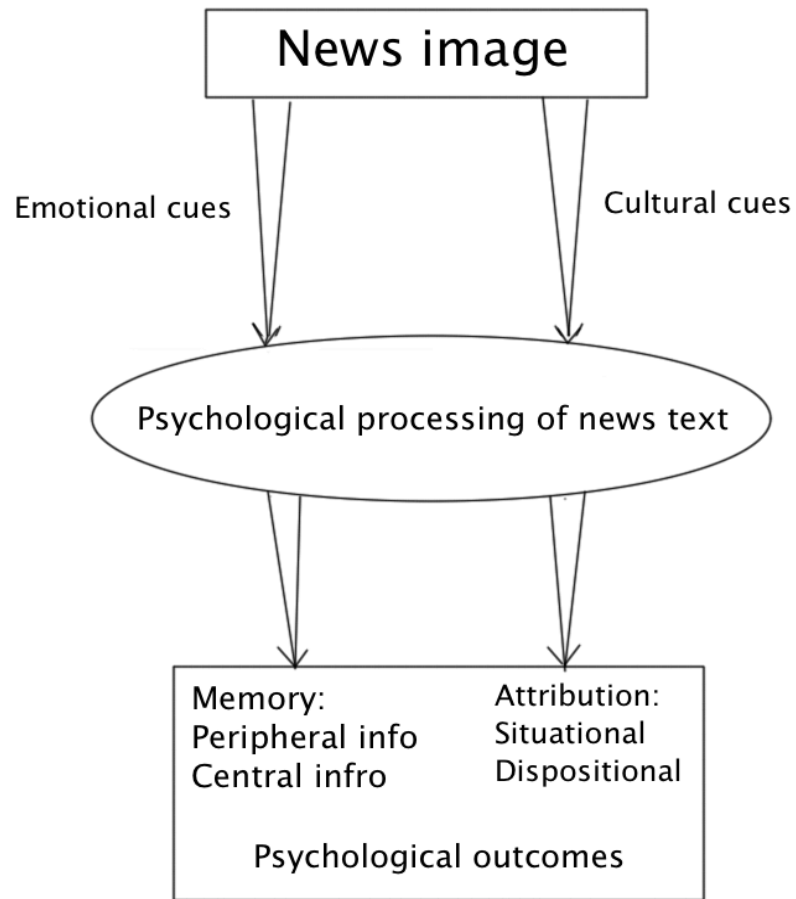
#### *Culture and Emotion on Information Processing*

Considering the intuitive notion that both emotion and culture could play an important role in how news messages are processed, the study of their interaction is surprisingly under-populated. Among the limited numbers of studies that have been conducted, Grossmann et al (2012) found Russians to be primarily characterized as brooding and melancholy in their news consumption behaviors. He found, for instance, Americans took about the same amount of time looking at pleasant and unpleasant images, whereas Russians spent more time looking at the unpleasant images. The cultural advantage model touches on the relations between emotion and culture. It predicts that individuals recognize emotions of members of their own cultural group more accurately and efficiently. Yet these findings do not shed much light on the question at hand. In any case, considering the possibility the two do interact suggests the following question:

***Research Question 5: Do cultural and emotional cues of news images interactively affect memory and attribution assessment of news text?***

Given the review and discussion above, the conceptual model of this study can be summarized in figure 7:

**Figure 7. Emotion, Culture, Memory and Attribution**



## Chapter 2: Methodology

This is a 2X2X2 fractional factorial repeated measures experiment designed to capture differences between Chinese and European American news consumers in their processing of news stories containing both images and text<sup>12</sup>. The factors included image emotion (positive vs. negative: within-subject), image culture (image in a Chinese setting with Chinese individuals versus image in an American setting with European-American individuals: within-subject), and subject culture (Chinese news readers versus European American news readers: between-subject). There also were four repeated measures of each stimulus condition to avoid false inference being drawn for variance caused by elements not explicitly manipulated in any given story.

In order to synthesize both dimensional and dynamic constructivist views of cultures as mentioned earlier, this study does the following: 1) It tests cross-cultural European Americans and Chinese's cognitive processing by treating them as cultural groups with distinct, stable processing patterns. 2) At the same time, it "primes" these two groups with culture-laden news images which are believed to prompt cultural "frame switching (Hong, Morris et al. 2000)." Culture-laden images that portray individual(s) from an easily identifiable cultural background are believed to "activate" the corresponding cultural schema in the viewers. The Chinese culture, as a subset of the

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<sup>12</sup> Fractional designs guard the main effects and interactions of interest against effects that do not bear on theory and thereby held as control. In this study, only emotions and cultures of news images were of theoretical interest. Thus, news story topic was held as a repeated measure to prevent unmeasured story topic effect, avoiding Type I error. With this technique, participants saw all stories, but they did not see all of the emotional and cultural dimensions of the news images within all stories. Among the participant population as a whole, however, all emotions and cultures were seen by the participants. For more information, see Winer, B. J., et al. (1991). Statistical principles of experimental design. New York, McGraw-Hill.



Asian culture was compared with European American culture. Choosing a sub-culture of a large cultural group to compare is a widely accepted way of research in the field of cross-cultural communication and cross-cultural psychology (i.e. Markus and Kitayama 1991, Morris and Peng 1994, Peng and Nisbett 1999, Zhong 2008).

Four different news story topics were used as a repeated measure to minimize the effect of story topics on the design. The story topics themselves are not a variable of research interests. Table 1 shows the experiment design in a nutshell.

**Table 1. Experiment Design**

<b>Between-subject factor: Participant Culture</b>	<b>Chinese</b>				<b>European American</b>			
<b>Within-subject factor 1: Image Emotion</b>	Negative		Positive		Negative		Positive	
<b>Within-subject factor 2: Image Cultural Setting</b>	Chinese	European American	Chinese	European American	Chinese	European American	Chinese	European American

### Participants

A total of 48 participants were recruited from a large metropolitan area in the Eastern coast of the United States. Half were Chinese who just arrived in the United States for the first time for a short stay. These Chinese were from diverse professional backgrounds, including employees of local governments, professors, entrepreneurs, administrative staff at universities. The other half was American of Western European heritage, who have lived most of their lives in the United States. These American participants also worked in various industries.

None of the participants were students. The study only used non-student participants, as students only count for a small percentage of the people who read news online, thus being not representative enough.

Participants received either financial compensation of 20 dollars or a T-shirt as a gift for their participation. 28 females and 20 males, ranging from 21 to 60 years old, completed the experiment with none withdrawing. Approximately 60 percent of the participants said that they spent 1-5 hours watching or reading news every week. About 20 percent said that they spent 5-10 hours a week on watching or reading news. Almost 40 percent of the participants suggested that they sometimes received news from international news organizations, such as BBC, Al Jazeera and CNN. Approximately 40 percent of them said that they read news from international news organizations often or quite often. This indicates that the participants read news on a regular basis and most of them were exposed to cross-regional news coverage.

All participants read and agreed to an informed consent protocol approved for the study in accordance with the university's Institutional Review Board prior to the experiment. They were told that the participation in the experiment was totally voluntary and they could terminate the experiment anytime.

### Material

The experimental stimuli included the text from four news stories. They were all about 250 words long. The length allowed each story to be shown in one single page. Thus, the participants did not need to scroll down a page to finish reading a story. The stories were adapted from a number of actual news stories from various online mainstream news sources. Each story was accompanied by an image pretested for its emotional valence and intensity. The actual presentation format was conformed to the style and format frequently used by mainstream media news sites to display a story when a user clicks through a link on their main page. Stories and accompanying image topics included gay marriage, the selection of a new president for the World Bank, binge drinking on campus and Sino-U.S. trade frictions. The stories were rewritten in a way to be sure that there were no time-sensitive elements and that they conformed to standard journalist protocols of fairness, balance, addressing both sides of the controversies to appear as neutral and unbiased as possible. Two reviewers with decades of journalistic background checked all news stories to make sure they conformed to these standards. See Appendix A for images and texts used in the stimulus.

### Image Pretest

#### Pretest Procedure.

First, a pool of 40 images collected from online news sources appropriate to the stimulus texts topics were preselected by researchers experienced in media emotion research. The images were selected to represent a wide range of both hedonic valance, from positive to negative, and intensity, from very intense to very calm. Images were selected where the cultural appearance, either Asian or European, of the main character was unequivocal.

The images in the pool were rated for their emotional valence and intensity by 8 Asians and 17 European Americans who were recruited through snowball sampling<sup>13</sup>. While the group did not represent a random probability sample, a diverse group across variables such as age and gender were recruited.

Upon arrival at the research laboratory, participants were greeted and signed an informed consent form. They were then seated in front of a 17-inch computer monitor and instructed to rate the 40 preselected news images first for their emotional valence and then their intensity. Participants rated valence and intensity by judging each image on the 5-point scales of Self-Assessment Manikin (SAM) pictorial scale (Bradley and Lang 1994). Figure 1 and 2 show the SAM Manikin pictures. The participants were given a button box with SAM images taped to it. Participants were asked to press a button below the SAM image they felt best represented the emotion in the photo on the computer

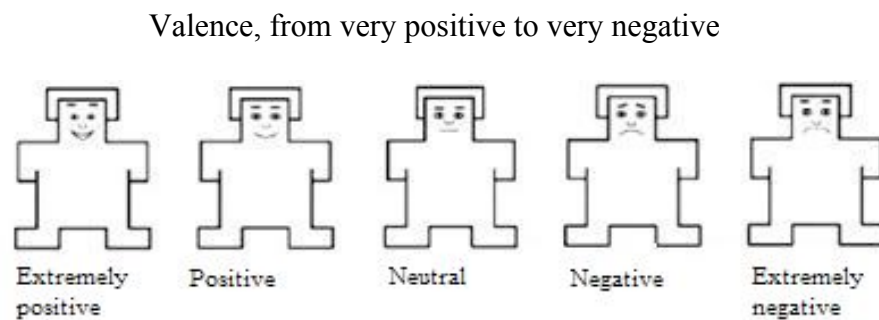
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<sup>13</sup> The volunteers for the image pretest were recruited using snow sampling. It started from a small group of three non-student volunteers. They encouraged and recruited their friends to participate through phone. None of the volunteers were students.

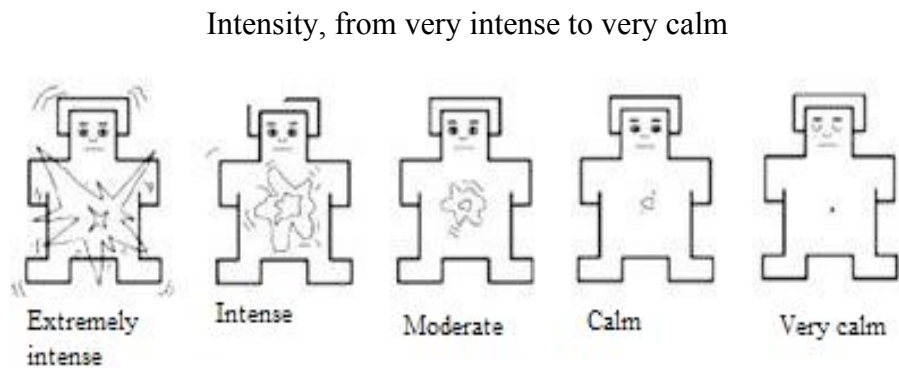
screen, as fast as they could after they made their decision. Once they pressed the button, the next photo was displayed.

Participants were first asked to rate the emotional valence of the 40 images by using the SAM Manikin pictures in figure 8. The news photos were presented in a random order. After the first round, the 40 images were displayed again in a random order for the participants to rate the emotional intensity by using SAM Manikin pictures in figure 9.

**Figure 8. SAM Manikin: Valence**



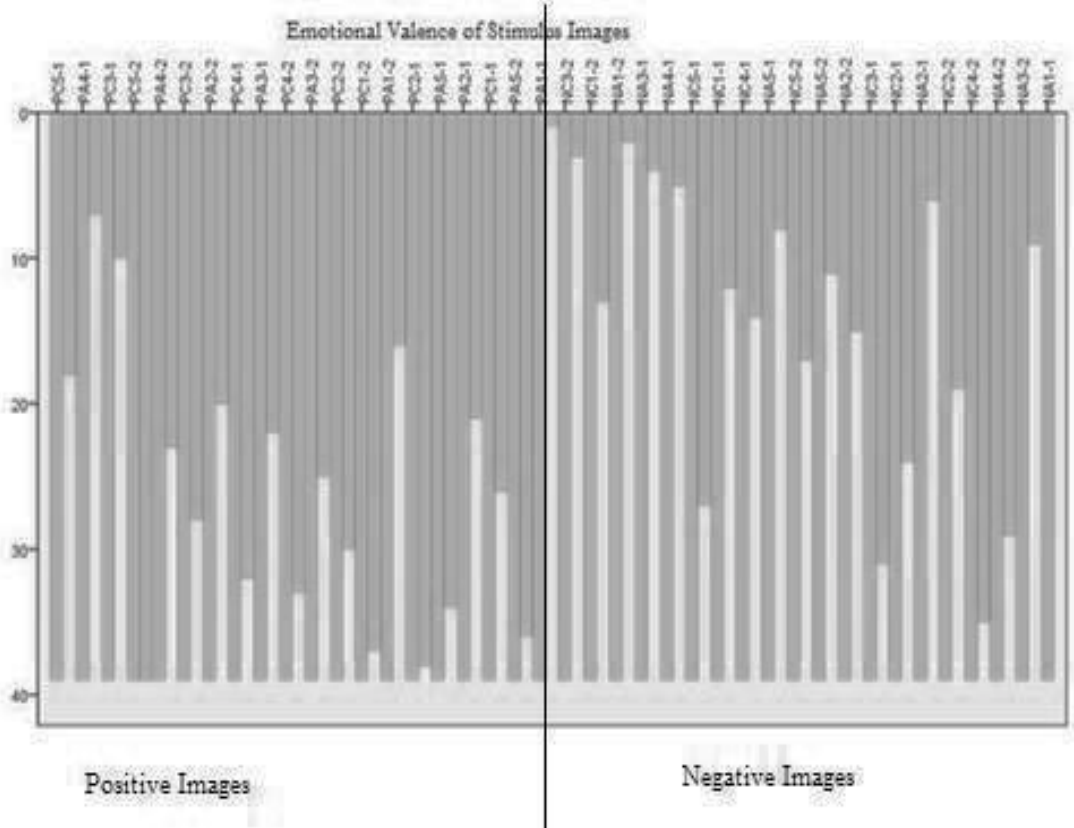
**Figure 9. SAM Manikin: Intensity**



### Pretest Results.

Out of the 40 images, 16 were selected for the final stimulus. Four images were selected for each of the four story topics, two with the largest the positive mean value and two with the largest negative mean value, all with an “intensity” rating at “intense” or “very intense.” Although intensity was not a factor of research interest in this study, only high-intensity images were chosen, as they would be more likely to evoke emotions in the participants than the low-intensity ones. Hierarchical cluster analysis was employed to aid in the selection of the images. The analysis supported judgments suggested by the earlier analyses. The cluster analysis separated into two distinct clusters, negative and positive, on the very first iteration, as can be seen in the icicle plot in Figure 10.

**Figure 10. Emotional Valence Clusters of Pretested Images**



### Experiment Design

Between-Subject Factor: Participant Culture.

Subject culture, Chinese participants or European American participants, is a between-subject factor in this study. The existing literature suggests that language can prime culture and affect the relative accessibility of culture-relevant norms and self-construals (Lechuga and Wiebe 2009). This means that when speaking and using Chinese, Chinese may think and behave in a way that is more congruent with the Chinese mental frame. The same is true with European Americans. Also, having participants read in their native language helps prevent issues of language proficiency. Therefore, the 24 Chinese participants in this study were presented with Chinese news text, whereas their 24 American counterparts read English news text. The images they saw were the same.

The news text was translated from English to Mandarin Chinese by the author. The translated text later was proofread by another native Mandarin-speaking journalist and was back-translated to ensure the authenticity and accuracy of the translation. All the instructions to the Chinese participants were in Chinese, whereas those for Americans were in English. This helped prevent issues caused by language proficiency during the experiment. The instruction layout, the size of the words and the order of the instructions on the screen were exactly the same in both languages.

Within-Subject Factor Manipulation.

The final stimulus displayed four news stories with an example of the four different topics to each participant, where news story was used as a repeated measure to

insure against unintended message effects. Text for the four stories was invariant between subjects with the exception that Chinese participants saw stories written in standard Mandarin Chinese, and European Americans saw the text displayed in English. Each story is about 250-word long and both the image and the text were visible without having the participants to scroll. Each participant saw four stories in a random order accompanied with one of the four conditions of the news images, a positive or a negative image of Chinese, or a positive or negative image of European Americans.

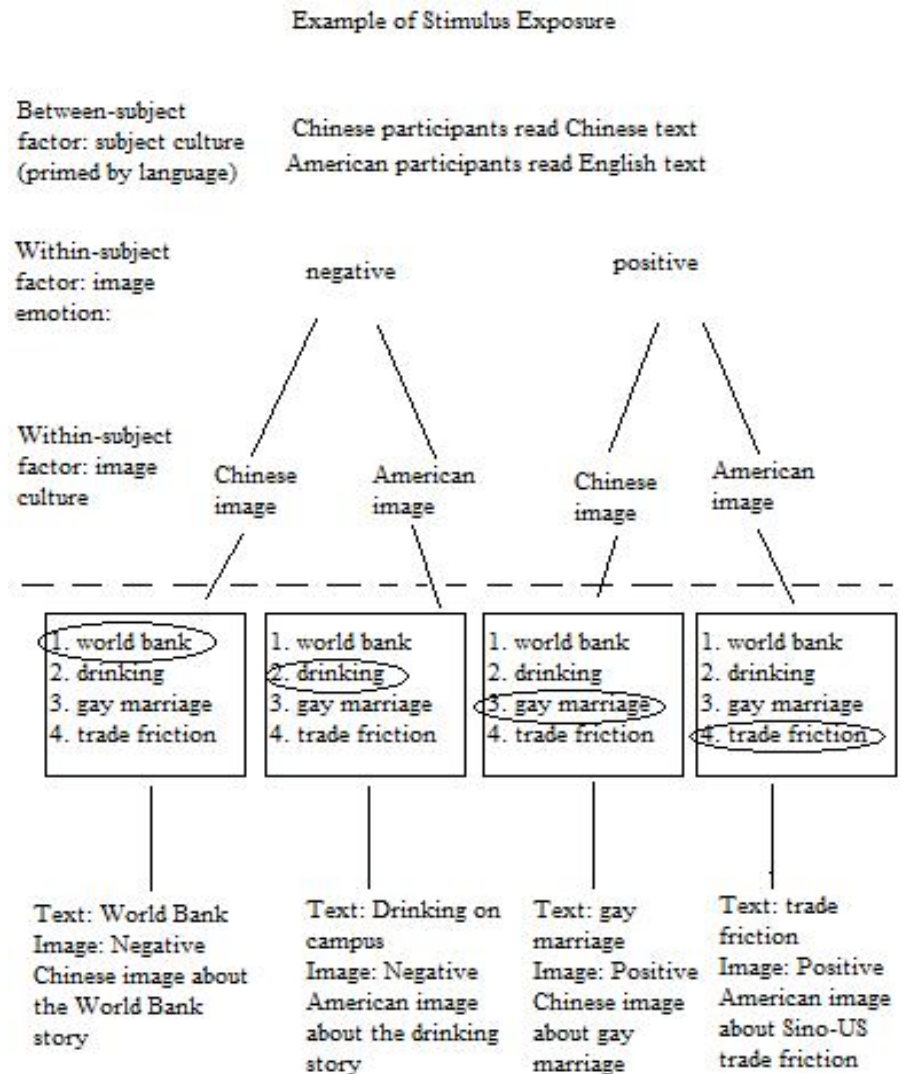
Thus all participants saw a story including an image of a Chinese displaying negative emotion, a story including an image of Chinese displaying positive emotion, a story with an image of a European American showing positive emotion, and story with an image of a European American displaying negative emotion for a total of four stories.

The use of a fractional factorial insured that 16 images were seen even though not all participants saw all the images. This technique was employed to allow for the examination of complex theoretical factors of interest while minimizing the number of participants required.

The presentation was randomized for both story order and image order. Figure 11 shows an example of what a participant saw.



**Figure 11. Example of Stimulus Exposure**



In the example shown in figure 4, this participant saw a World Bank story with a negative Chinese image relevant to the story, a story about drinking on campus together with a negative American image, a story about gay marriage with a positive Chinese image, and a story about Sino-US trade frictions accompanied with a positive American image.

For instance, another experiment participant may see four stories a different set of images in the following order: a Chinese positive image about the World Bank followed by the news story about the World Bank, a positive American image about binge drinking followed by the news story about binge drinking, a negative American image about gay marriage followed by the news text about gay marriage, and lastly a negative Chinese image about Sino-US trade relations followed by the news text about trade frictions. See Appendix A for all stimuli.

There were 24 types of combinations of the four topics, image valence and the culture of the image. See the table below for the 24 arrangements. The 24 participants in both cultural groups will be randomly assigned to see one of the 24 arrangements. The order of the appearances of the four stories was also randomized.

**Table 2. Image Conditions Arrangements with Story Topics**

World Bank-Neg.Am.	Drinking-Neg.Chi.	Gay Marriage-Pos.Am.	Trade-Pos.Chi.
World Bank-Neg.Am.	Drinking-Neg.Chi.	Gay Marriage-Pos.Chi.	Trade-Pos.Am.
World Bank-Neg.Am.	Drinking-Pos.Am.	Gay Marriage-Neg.Chi.	Trade-Pos.Chi.
World Bank-Neg.Am.	Drinking-Pos.Am.	Gay Marriage-Pos.Chi.	Trade-Neg.Chi.
World Bank-Neg.Am.	Drinking-Pos.Chi.	Gay Marriage-Pos.Am.	Trade-Neg.Chi.
World Bank-Neg.Am.	Drinking-Pos.Chi.	Gay Marriage-Neg.Chi.	Trade-Pos.Am.
World Bank-Neg.Chi.	Drinking-Neg.Am.	Gay Marriage-Pos.Am.	Trade-Pos.Chi.
World Bank-Neg.Chi.	Drinking-Neg.Am.	Gay Marriage-Pos.Chi.	Trade-Pos.Am.
World Bank-Neg.Chi.	Drinking-Pos.Chi.	Gay Marriage-Pos.Am.	Trade-Neg.Am.
World Bank-Neg.Chi.	Drinking-Pos.Chi.	Gay Marriage-Neg.Am.	Trade-Pos.Am.
World Bank-Neg.Chi.	Drinking-Pos.Am.	Gay Marriage-Pos.Chi.	Trade-Neg.Am.
World Bank-Neg.Chi.	Drinking-Pos.Am.	Gay Marriage-Neg.Am.	Trade-Pos.Chi.
World Bank-Pos.Am.	Drinking-Neg.Am.	Gay Marriage-Pos.Chi.	Trade-Neg.Chi.
World Bank-Pos.Am.	Drinking-Neg.Am.	Gay Marriage-Neg.Chi.	Trade-Pos.Chi.
World Bank-Pos.Am.	Drinking-Neg.Chi.	Gay Marriage-Neg.Am.	Trade-Pos.Chi.
World Bank-Pos.Am.	Drinking-Neg.Chi.	Gay Marriage-Pos.Chi.	Trade-Neg.Am.
World Bank-Pos.Am.	Drinking-Pos.Chi.	Gay Marriage-Neg.Chi.	Trade-Neg.Am.
World Bank-Pos.Am.	Drinking-Pos.Chi.	Gay Marriage-Neg.Am.	Trade-Neg.Chi.
World Bank-Pos.Chi.	Drinking-Pos.Am.	Gay Marriage-Neg.Chi.	Trade-Neg.Am.
World Bank-Pos.Chi.	Drinking-Pos.Am.	Gay Marriage-Neg.Am.	Trade-Neg.Chi.
World Bank-Pos.Chi.	Drinking-Neg.Chi.	Gay Marriage-Pos.Am.	Trade-Neg.Am.
World Bank-Pos.Chi.	Drinking-Neg.Chi.	Gay Marriage-Neg.Am.	Trade-Pos.Am.
World Bank-Pos.Chi.	Drinking-Neg.Am.	Gay Marriage-Pos.Am.	Trade-Neg.Chi.
World Bank-Pos.Chi.	Drinking-Neg.Am.	Gay Marriage-Neg.Chi.	Trade-Pos.Am.

*Note: Pos.: positive, Neg.: negative, Am.: American, Chi: Chinese*

*World Bank: World Bank story*

*Drinking: Drinking story*

*Gay Marriage: Gay marriage story*

*Trade: Sino-US Trade story*

### Experiment Procedure

Upon arrival at the research lab, participants signed an informed consent form, and were then seated in front of a 17-inch computer monitor. Participants were told they would see news stories on the screen and that they should read news. During the experiment, participants were randomly assigned to one of twenty four stimulus arrangements (Table 2). They were told to use a white button box to make choices. All text appeared on a white screen in 12-point black Times New Roman. Chinese participants saw everything, including the story text and experiment instructions, in simplified Mandarin Chinese, whereas American participants saw everything in English. An experimenter was in the laboratory at all time to answer questions from the participants. The experimenter sat in a separate cubic adjacent to the one the participant without interfering with the experiment.

When the presentation began on the computer screen, the participants first were greeted and asked if they had any questions or concerns. After questions were addressed, participants were instructed to see four news stories each accompanied with an image. They were told to read the news story as they normally would at home. Once they finished a story, they pressed a random key on the button box to proceed to the next story. After they finished reading all four stories, they were asked to take a 30-second break at a corner in the laboratory, where they could not see the experiment screen. All objects in the laboratory that could be potentially distractive had been taken down before the experiment started.

After they were called back to their seat, they were instructed to rate the overall valence of each story on a scale from “extremely negative” to “extremely positive” using

the button box. Then, they proceeded to image recognition test. The instructions on the screen asked them to respond to each news image they were about to see by pressing “yes” or “no” to signal whether the image was in the stories they just read.

Four of the eight images presented were in fact in the stories, whereas the rest were relevant images but were not present in the stories they just read. Eight images were displayed in a random order. Once they pressed a button, the next image was displayed right away. Before they started the image recognition test, they were given two images to practice with. The practice images were about pets, which were completely irrelevant to the news stories and were hopefully help the participants relax a little bit before they got into the real tests. The experimenter had addressed questions or concerns before the participants began the recognition test.

Following the recognition test, they were given 20 multiple-choice questions about the news stories they read, with five questions about each story. Before the 20 questions were displayed, participants were given trial questions to get them familiar with the type of questions they were about to see. The trial questions were about topics that were by no means related to the stimulus topics. In the 20 questions, questions came in a set of five questions about a story topic. The order of the appearance of each of the five questions was randomized, but all five questions about the same story topic were asked together. The four sets of the five questions appeared also in a random order.

The experiment was concluded with a set of demographic questions, asking about participants’ basic information such as age and educational background as well as news consumption habits.

Participants' response to each question was recorded automatically by the DirectRT software along with the latency data. The latency data indicates how long one spent on answering a question in milliseconds. The participants were not told about the recording of the latency data, thus the latency data collected should be indicative of how fast they would normally respond to a question.

While responding to questions, the participants were not given an option to click back to a previous screen. After completing all segments, participants were thanked for their participation, paid, and dismissed.

### *Dependent Measures*

This study looked at how news consumers retained and evaluated news information differently when it was presented in different emotional tones and cultural settings. While traditionally memory is assessed through self-report, this study measured memory with both self-report and latency data. Latency data were measured in milliseconds. This study first checked the memory accuracy and attribution judgment of the text information by analyzing participants' answers to the multiple-choice questions about the news stories (self-report). Then it examined the participants' image memory by looking at their recognition time (latency).

#### Text Memory and Assessment.

Following the image recognition tests, a battery of 20 multiple-choice questions was presented in a random order (See Appendix B for the questions). Each five questions asked about the news information in one of the news stories they just read. The order of the appearance of the sets of questions regarding the four topics was random. These 20

questions include questions about the memory of the news story and readers' attribution assessment.

*Memory of central versus peripheral information.*

Memory of central and peripheral information was measured separately by using two sets of questions. In the five questions about each story topic, two questions asked about a central piece of information about the news issue. Another two were about peripheral auxiliary information mentioned in the story (i.e. Morris and Peng 1994, Masuda and Nisbett 2001, Nisbett, Peng et al. 2001). The last question was about news evaluation. This will be introduced in the text evaluation section below.

As for the central versus peripheral information, here are two example questions. For example, "What is the percentage of the Beijing population that supports same-sex marriage? A. 25% B. 30% C. 42% D. 50%" is a question about peripheral information regarding the news story about legalization of same-sex marriage in the United States. Taking out this piece of information would not change the main story line at all, since the main story was based in the United States. The experiment was conducted before the heat of the presidential election coverage. Thus, the topic under discussion should not be affected by the presidential election reporting.

By contrast, "According to this article, why was Obama criticized by social conservatives? A. Conservatives think that his move about gay marriage is just an election-year ploy. B. Conservatives think that Obama made the statement to support Vice President Biden who favors gay marriage. C. Conservatives think that Obama betrays his Christian beliefs. D. Conservatives think that Obama is an incapable

president” is a question that asks about a major piece of information in the news about same-sex marriage. This information is “central” as it is conceptually integral to the news story.

All questions can be found in Appendix B. All questions regarding each story topic were presented in a random order.

*Text attribution.*

Text attribution was measured by the last of the five questions. Text evaluation here indicated the news readers’ attribution judgment on what caused the news event: the *dispositional* personal attributes of the main character or the *situational* environmental factors (i.e. Morris and Peng 1994, Choi, Nisbett et al. 1999).

For instance, “What do you think is the biggest factor that leads to binge drinking on campus? A campus environment that condones drinking. B. Students lack self-discipline.” is an attribution question about the story about drinking on campus. Choice A represented an external situational factor, whereas choice B suggested an internal dispositional factor of the students.

Another example is that “what do you think is the biggest fact that led to the fall of some American solar panel companies?” Response option A represents a situational factor by saying “the threat from Chinese products.” Response option B represents an internal factor about the American solar panel industry by saying “the American solar panel industry was not competitive enough.”



More attribution assessment questions can be found in Appendix B. The respondents was instructed to answer this question as a general evaluative question, without knowing that the true intent behind it.

#### Image Memory.

During the experiment, participants were shown eight images, which consisted of four images that were in fact in the news stories and four that were not there at all. They were instructed to press “yes,” if they felt that they saw that image and “no,” if they didn’t. Participants’ latency to recall in millisecond was stored and analyzed as indicators of their memory strength of the news photos. The assumption underlying the latency testing is that the stronger the links between the nodes in the associative mental networks that make up memories, the more they are accessible and retrievable (Bower and Karlin 1974, Anderson 1983, Newhagen 2011). Thus, shorter response times signal less mental effort to retrieve and thus better memory.

#### Text Emotion.

Immediately after the exposure to all stories, participants were asked to rate the overall valence of each story. Participants rated valence by judging each story on the 5-point scales of Self-Assessment Manikin (SAM) pictorial scale (Bradley and Lang 1994). Figure 1 shows the SAM Manikin pictures, ranging from extremely negative to extremely positive. The participants used the button box with SAMS images taped to it. They pressed a button below the SAM image they felt best represented the emotional valence of each story, as fast as they made their decision. Both their choice (self-report data) and

response time (latency data) were recorded. Again, the respondents did not know that their response time was being recorded.

Demographics.

Finally, age, gender and other demographic questions about news consumption concluded the questionnaire. As indicated earlier, the participants recruited were balanced in gender and diverse in age.

## Chapter 3: Results

The dependent variables in this study included memory of news text, especially the memory of “central” versus the “peripheral” information, as measured by the participant’s response to a set of multiple-choice questions, attribution styles, and memory of news images, measured as memory accuracy and latency to respond. These questions concerned the information in the news stories and the latency of the response, attribution judgment of the news event, measured as either “situational” or “dispositional” attribution style; the overall felt emotion of the news stories measured on the 5-point Self–Assessment Manikin (SAM) pictorial scale (Bradley and Lang 1994). All memory accuracy data were considered as self-report data, as they were participants’ direct responses to questions and were either correct or incorrect, whereas latency data were collected non-invasively during the experiment in the background.

The primary statistical procedures employed to analyze data were repeated measure analysis of variance and generalized estimating equations (GEE).

### Text Memory

#### Accuracy of Remembering Peripheral Information.

This study was especially interested in looking at differences in the memory of central and peripheral information in the news text across participant culture. For this study, central information was conceptualized as the core message the news text was set to deliver, while peripheral information was conceptualized as non-significant details that were only supplementary to the core message.

Participants were given a battery of questions measuring their memory for textual information. Two questions central information, and two for peripheral information were administered for each of the four story topics.

Participants had to choose from one of four possible options for each questions. The first step in the analysis was to recode their responses as binary variables, either correct, or incorrect.

The Generalized Estimating Equations (GEE) test was used to analyze those data<sup>14</sup>. GEE models examined the effect of participant culture, image culture, and image emotion on the memory accuracy of the peripheral information in the news text. The tests yielded a significant three-way interaction among subject culture, image culture and image emotion, Wald  $\chi^2(1)=4.60$ ,  $p=.032$ ; Exp15 (2.799)=16.428,  $p=.032$ . A three-way interaction means that the two-way interaction between image culture and image emotion on memory accuracy of peripheral text information varied across the two levels of participant culture (Participant culture: European American versus Chinese).

Performance here is indicated by the odds of remembering peripheral information correctly. The “odds” are an outcome of dividing the probability of remembering correctly by the probability of remembering incorrect.

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<sup>14</sup> The repeated measures analysis of variance is mean comparison based on continuous dependent variables. However, in this case, participants' memory of central and peripheral information was each measured by a multiple-choice question, which yielded a binary answer that was either correct or incorrect. Due to this binary nature of the dependent variable, the Generalized Estimating Equations (GEE) test was employed. The method of GEE is often used to analyze longitudinal and other correlated response data such as repeated measures, particularly if responses are binary. Read more in Zeger, S. L. and K. Y. Liang (1986). "Longitudinal data analysis for discrete and continuous outcomes." *Biometrics* **42**: 121-130.

<sup>15</sup> Exponential function is the function  $e^x$ , in which  $e$  is approximately 2.718.

Figure 12 demonstrates the interaction effect of image emotion, image culture and subject culture on the odds of remembering peripheral information correctly, when participant culture is European American.

**Figure 12. Odds of European Americans Remembering Peripheral Information Correctly<sup>16</sup>**

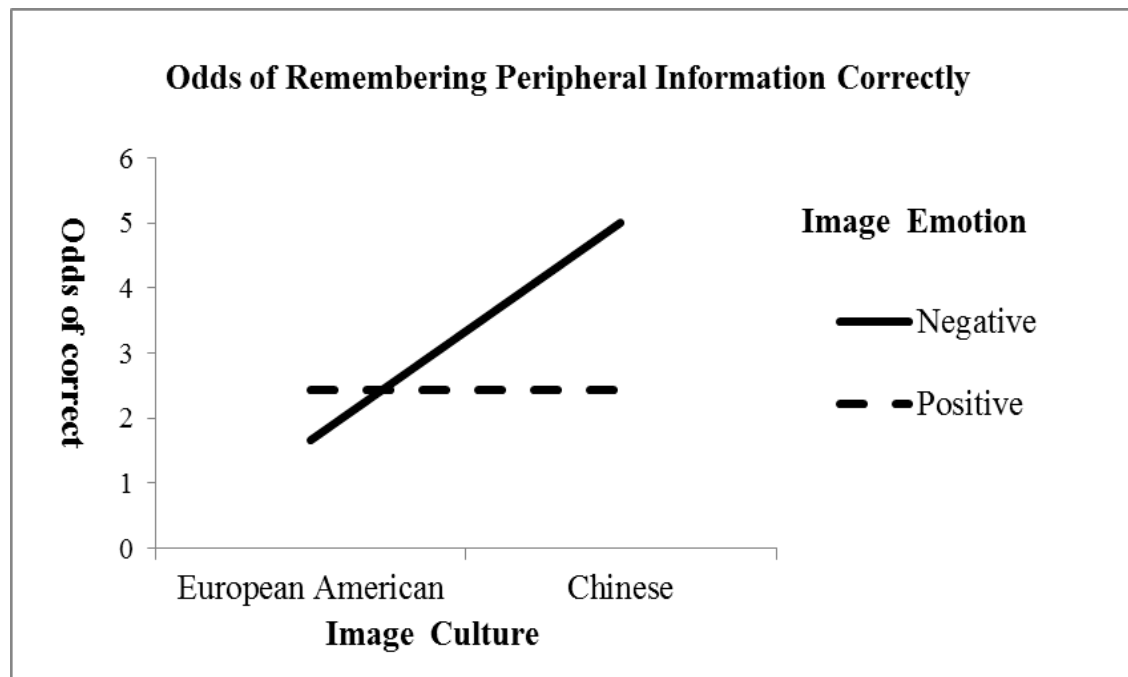


Figure 12 indicates that for European American readers, if the image portrayed European Americans in a negative tone, were least likely to remember the peripheral information. However, when the image was about the Chinese, European Americans were more likely to remember peripheral information in the news text correctly in the news story when the image was negative. The figure shows that the difference in memory of peripheral information was more noticeable and dramatic, when the news image portrayed Chinese.

<sup>16</sup> Figure 12 and 13 were plotted with observed data to show the interaction trends.

Figure 13 demonstrates the interaction effect of image emotion, image culture and subject culture on the odds of remembering peripheral information correctly, when participant culture is Chinese.

**Figure 13. Odds of Chinese Participants Remembering Peripheral Information Correctly**

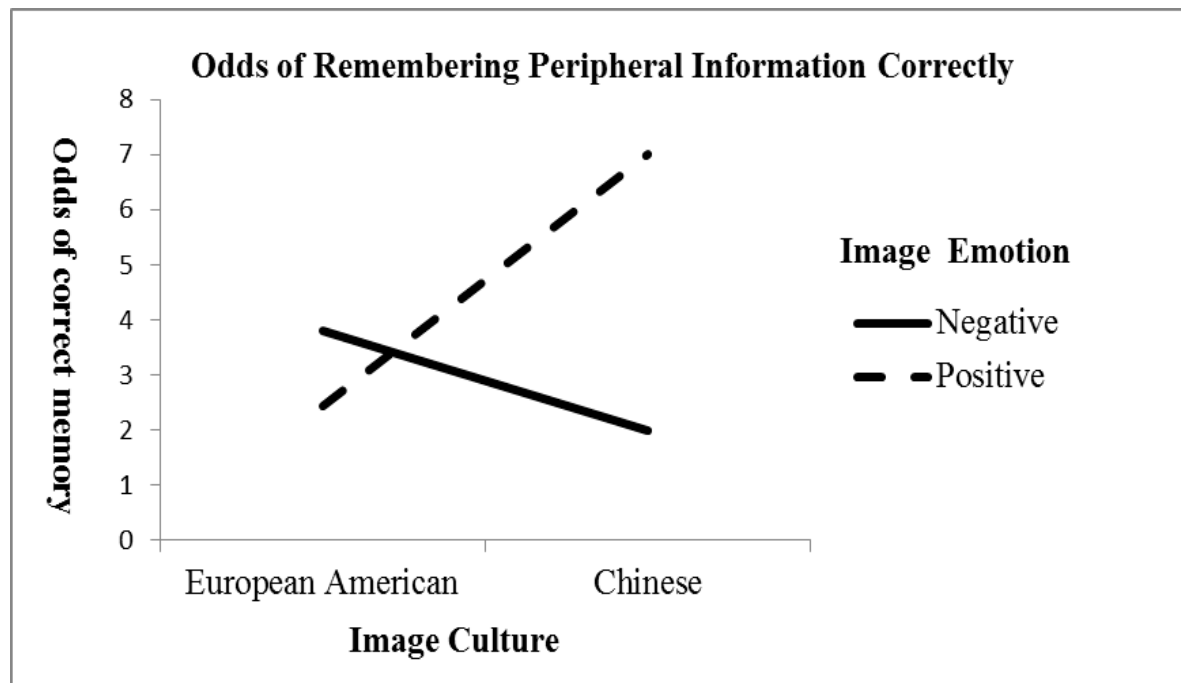


Figure 13 shows that the result for Chinese participants was nearly the opposite to those of the European American participants. Here, participants remembered peripheral information at about the same level when the image portrayed European American. It is interesting to note, however that the odds scores were about twice that as they were for European Americans. However, when the main character in positive images was Chinese they were more likely to remember peripheral information correctly in the text. When the Chinese images were negative, the memory of the peripheral information was least likely to be correct.

What these two figures show is that participants were more likely to demonstrate accurate memory of peripheral details in the news stories they read in two circumstances: 1) the story was associated with a positive image portraying their own culture; 2) the highest probability of remembering peripheral textual information was always when the main character in the news image was a Chinese, regardless of the emotional valence of the image.

#### Accuracy of Remembering Central Information.

The results show that none of experiment factors in this study had a significant effect on the participants' memory of the central information in the news text.

Overall, Chinese and European American participants did not differ in their memory accuracy of the central information in the news text, whereas the interaction effect between image culture and image emotion on memory accuracy of peripheral information was dependent on the participants' culture. This outcome will be discussed in more detail in the concluding chapter of this text.

#### Text Attribution

Attribution was also coded as a binary variable—either situational or dispositional. Thus the Generalized Estimating Equations (GEE) tests again were used to analyze the data. “Dispositional” refers to personal attributes of the main character in the news, whereas “situational” refers to environmental factors.

#### Odds of Attributing News Event To Situational Factors: Main Effect.

There was a main effect of image emotion on the odds of choosing situational factors to explain a news event regardless of image or participant culture, Wald  $\chi^2(1)=7.14, p=.008$ . Again, the “odds” here refer to an outcome of dividing the probability of situational attribution by the probability of dispositional attribution. When a news story was accompanied with a negative photo, the news readers, irrespective of their cultural identities, were 4 times more likely to attribute the news event to situational environmental factors than to dispositional factors,  $\text{Exp}(1.386)=4.00, p=0.028$ .

#### Odds of Attributing News Event to Situational Factors: Interaction.

Figure 14 shows an interaction effect between image emotion and image culture on the odds of situational attribution (Wald  $\chi^2(1)=5.05, p=.025$ ).

**Figure 14. Odds of Situational Attribution by Image Emotion & Image Culture**

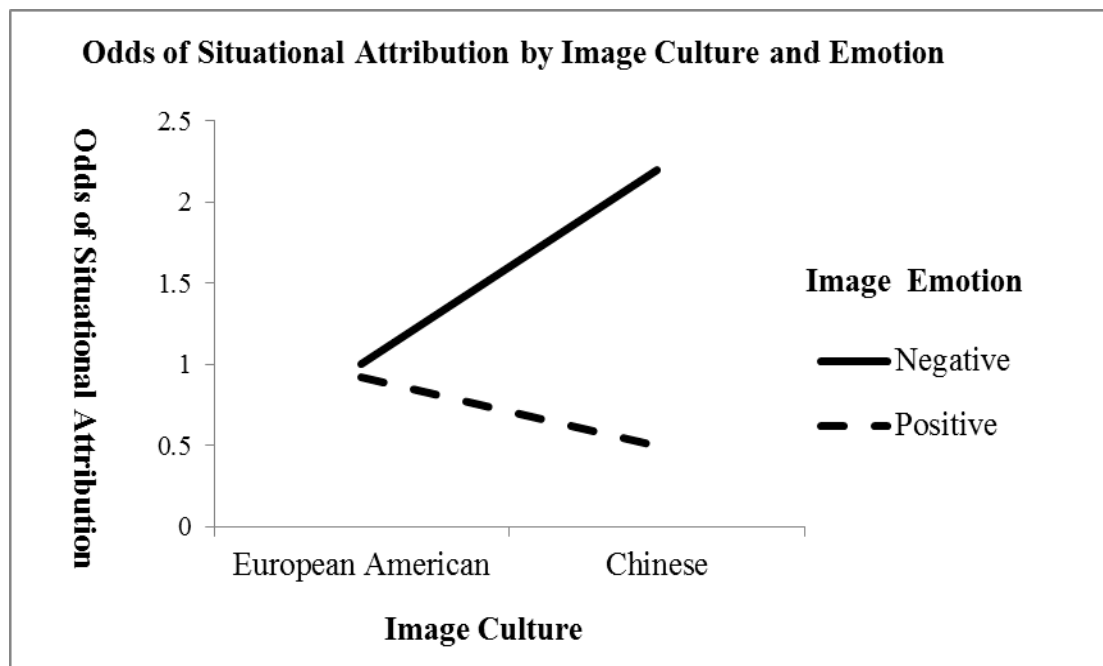




Figure 14 indicates that even though the participants used situational attribution much more often when seeing negative images than positive ones, this difference was minimal when the news images were about European Americans. This difference in attribution style between two emotions mainly came from Chinese images. In other words, if the news images were about the Chinese, participants were much more likely to use situational attribution when seeing negative images than positive images (odds=2.20 versus 0.50).

### Image Memory

Even though it is not the primary focus of the study, we are interested in looking at whether image culture and image emotion affected participants' memory of the news images. It also looks at differences in memory between Chinese and European American participants.

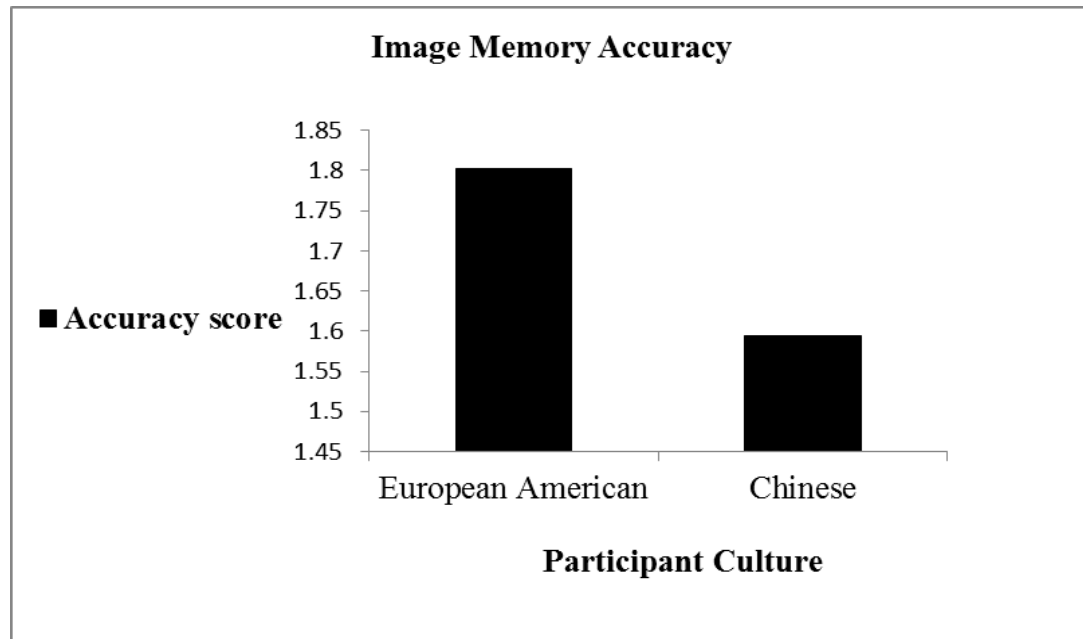
#### Memory Accuracy (Self-Report).

There was a main effect of participants' culture on the accuracy of their memory of news images,  $F(1, 46)=5.67, p=.021, \eta^2=.110$ . European American participants ( $M=1.802$ ) showed higher accuracy than their Chinese counterparts ( $M=1.594$ )<sup>17</sup>. Figure 15 shows the difference between European Americans and Chinese in their memory accuracy of the news images.

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<sup>17</sup> The scores were calculated based on participants' decisions about whether they felt they saw the news images. In each repeated measures condition, they were presented with two images, one they did see in the news and the other they did not see. For each question, a correct answer was coded as 1, an incorrect answer was coded as 0. If they made correct judgments on both photos, they would earn 2 points.

**Figure 15. Image Memory Latency by Participant Culture**

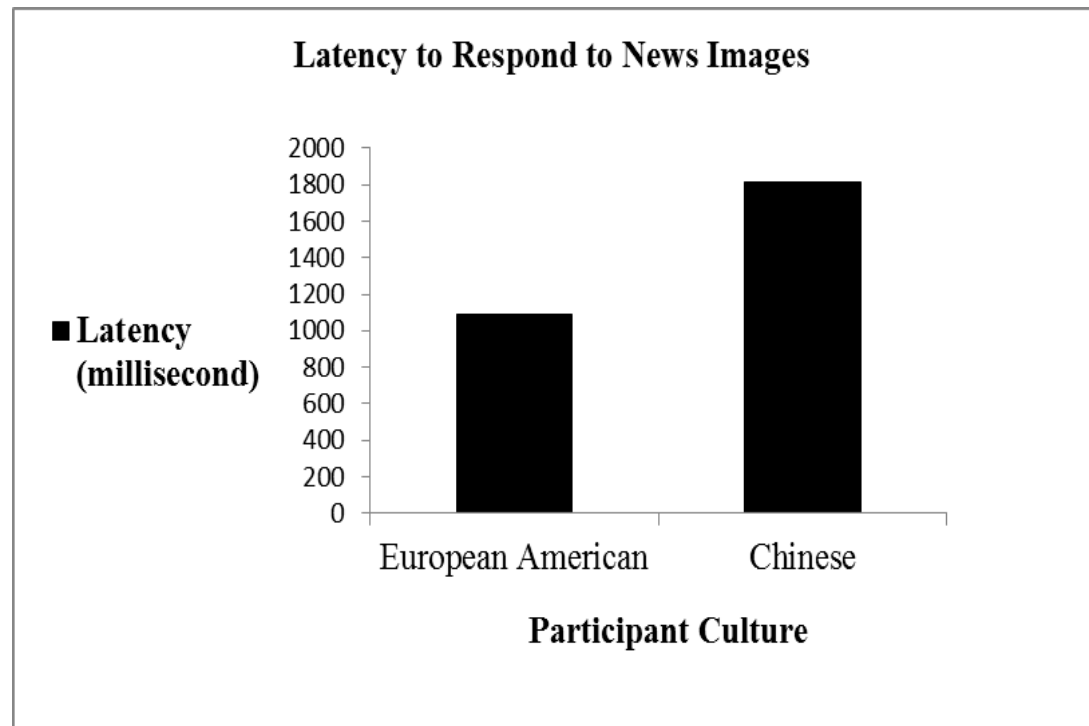


Latency to Respond.

A main effect of the participants' culture was also found on their latency to respond to the news images,  $F(1, 44)=12.74, p=.001, \eta^2=.225$ . European American participants were significantly faster in recalling images ( $M=1090.15$  ms) than their Chinese counterparts ( $M=1810.78$  ms).

Figure 16 shows the difference in the time Chinese and European American participants needed to recall the news images. A crossover interaction between image emotion and image culture was also detected regardless of the participant's cultural identity  $F(1, 44)=4.46, p=.040, \eta^2=.092$ .

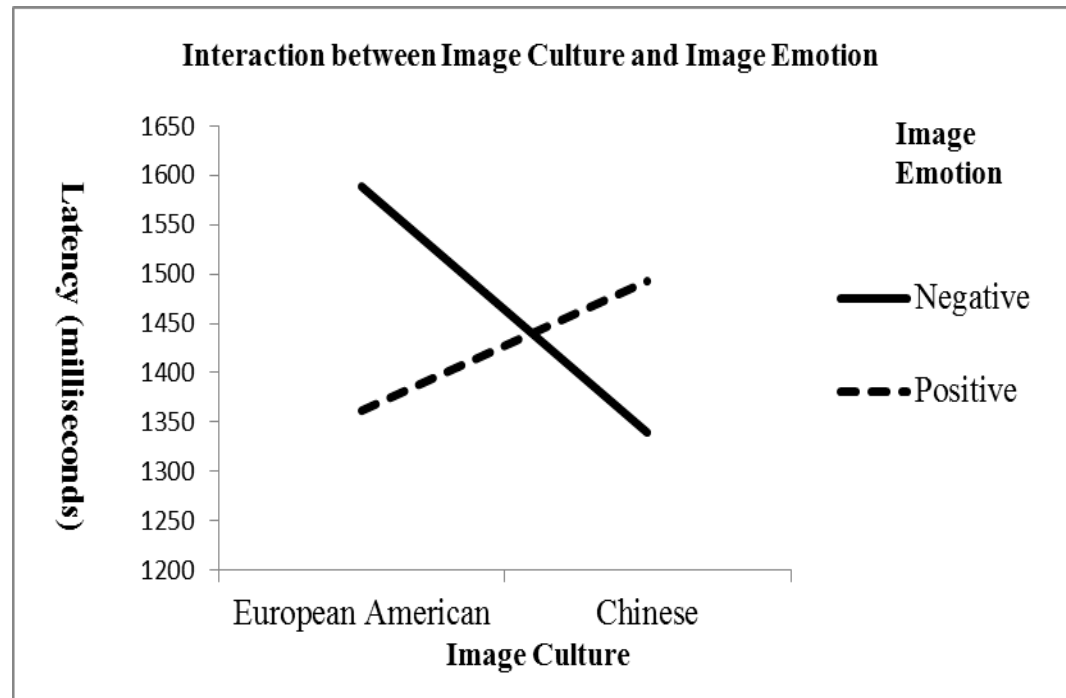
**Figure 16. Image Recall Latency by Participant Culture**



There was no main effect of the image emotion or culture on the latency to respond to the image. However, there was a significant interaction effect between image emotion and image culture on the latency.

Figure 17 shows this crossover interaction between image culture and image emotion. Participants responded to the negative Chinese images the fastest of all image types ( $M=13391.74$  ms) and negative European American images the slowest ( $M=1589.29$  ms). To break this down by image culture, when presented with images of European American individuals, participants recalled the positive images significantly faster ( $M= 1361.23$  ms) than the negative ones. When seeing images of Chinese individuals, participants recalled the negative images significantly faster than the positive ones ( $M= 1492.40$  ms).

**Figure 17. Image Recall Latency by Image Culture and Image Emotion**



Irrespective of the participants' own culture, when a news photo was about European American(s), it was better remembered, if it showed something emotionally positive than negative. By contrast, when a news photo was about the Chinese, it was better remembered, if it showed something negative than positive.

#### Overall Valence of Story

The result also suggested that even though the emotional valence of an image did affect people's information processing of the text content of a news story, the image emotion did not influence their evaluation of the emotional tone of the overall story ( $F(1, 190)=1.03, p=.31$ ). In other words, the readers' rating of the emotional valence of the news story did not vary whether the image was negative or positive.

### Summary of Results

The results indicate that the relationship between a participant's culture, the culture of the stimulus image elicits, and the emotion the stimulus image evoked in a number of subtle ways.

The within-subject factor image emotion played an important role in shaping news readers' memory and evaluation of the news text. The most prominent main effect of image emotion is that negative images lead to greater probability of using situational attribution style among news readers.

This is even more interesting when the effect of image culture is taken into account. Although we did not find a main effect of image culture, it did have significant interaction effect with image emotion on multiple dependent variables, such as odds of situational attribution, memory accuracy of peripheral information in the news text, and the recall latency of news images.

The between-subject factor participant culture did make a difference in the image memory latency scores and self report. Overall, European American participants performed significantly better than their Chinese counterparts in recalling news images they had seen in the stimulus.

If nothing else, these results supported the contention that that the relationships between culture and emotion would be complex. In some cases this might have reflect collinearity between culture and emotion, and should be interpreted as statistical artifacts. It is not unusual for the same type of volatility in beta scores emerge among collinear dependent variables in linear regression, a close cousin of analysis of variance. On the other hand, the scores may reflect true variance, especially when the differences are large

in magnitude. Again, this is especially true for three-way interactions, where one outlying data point may produce significant results. However, in this study the examination of such interactions is essential to the theoretical model and has to be considered very carefully.

## Chapter 4: Discussion

This dissertation was an experiment in looking at the effects of culturally salient and emotion-laden online news image on the processing of their accompanying news text, with a focus on memory and attribution assessment. Image memory was also examined. Overall, the data suggest that news images, which appear prior to the news text, do have a significant impact on how people process news information in the text. The effect of an image on text can be a function of both the emotional and cultural elements carried in the image. These cultural and emotional elements were categorized as whether an image portrays Chinese individuals or European Americans and elicits negative or positive emotions.

A generation ago this study might have appeared to be interesting but too exotic to consider in core communication and journalism theory. However, in the current Post Modern cultural milieu, especially in urban areas with enormously diverse populations, the questions asked here, albeit complex, should be of central interest to communication research. The consolidation of the news media and the interconnectedness of audiences make the current inquiries quite relevant and necessary.

The cultural and emotional cues of the image along with the cultural identity of the reader jointly determine how well readers remember peripheral supporting news information in the text, but not so much the central information about the news event.

Emotional valence of the image by its self is a determinant of the likelihood of participants attributing a news event to environmental factors over dispositional characteristics of the key person/people in the news. Overall, participants are more likely

to adopt situational attribution than a dispositional attribution assessment, when the news story is preceded by a negative news image. However, the tendency to employ a situational attribution style is most prominent, when the image portrays Chinese individuals. These findings and their implications will be fully elaborated in this chapter.

### *What Readers Remember?*

RQ1a probed the impact of emotion-laden images on the overall memory of the subsequent news text. The experiment found no significant impact of emotions elicited by news images on the overall memory of the news text. This indicates that even though negative content itself very often is found to be better remembered than positive ones (e.g. Newhagen & Reeves 1992, Lang and Dhillon 1995, Nabi 2003), when the negative emotion in one mode (image) is “carried over” to the processing of information in another mode (in this case news text), the effect of emotion may not be as “transferrable” and eminent. This would support the idea of a “dual processing” model of image and text. That is, one modality can be processed at a time and at the exclusion of the other. Thus, even though the image may present strong emotional information, when the participant read the stories that were written intentionally to be balanced and emotion free, they did so without being affected by the content of the accompanying image.

However, the data did show that image emotion and image culture jointly affect what exactly the readers remember about the news text. Overall, none of the image culture, participant culture and emotion affected the participant’s memory for the central/core information in the news text, whereas they did affect how well people remembered the peripheral supporting news details.



Culture Shapes the Effect of Emotional Valence on Memory Specificity.

Questions RQ1b, RQ3a and RQ3b asked about the effect of image emotion, image culture, and readers' cultural identity on how well they remembered the peripheral and central news information in the text. A three-way interaction between all three factors was found for the memory accuracy<sup>18</sup> of the peripheral information in the news story. The three-way interaction indicates that the two-way interaction effect between image emotion and image culture on memory accuracy of peripheral information in the text varied between the between-subject factor, participants' culture, either European Americans and Chinese in this study.

European Americans tended to remember peripheral information in the text best when the image was negative and portrayed Chinese individuals as the main characters. However, if a negative image portrayed European Americans, they were least likely to remember peripheral information correctly, that is, their memory seemed to "narrow" (see Levine and Bluck 2004, Schacter et al 2007).

Chinese participants were more likely to remember the peripheral information correctly for images that evoked positive emotion and portrayed Chinese. However, when the image elicited negative emotion and portrayed Chinese individuals, Chinese participants were least likely to remember peripheral information correctly.

These findings suggested an important trend in the way emotion and culture in the image affected memory of the text: for both Chinese and European Americans, when a negative image preceded the news text, memory of the text did "narrow," but only when image showed someone of the reader's own culture.

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<sup>18</sup> Again, memory accuracy was coded as either correct or wrong.

This finding, to a certain extent, supports the previous research which suggested negative emotions very often lead to memory narrowing and positive emotions lead to broadening, that is, when experiencing negative emotions, people tend to remember less peripheral information (e.g. Levine and Bluck 2004, Kensinger, Schacter et al. 2007b). It also suggests that it is critically important to consider “valenced emotion” as a “heuristic” in the processing of news information.

However, more importantly, this study points out the importance of being aware of the role of culture when making a generalization about how emotional valence “specifies” memory. In this case, memory narrowing or broadening as a result of emotional valence is only active when the news photo portrays someone of the readers’ own cultural group.

The Cultural Advantage Model (see Soto and Levenson 2009) can possibly offer some insight to this finding. This model argues that people are more efficient at recognizing emotions of others who are from the same cultural group. It is found that the mere perception that one belongs to the same group as a target can lead to better in-group emotion recognition (Thibault, Bourgeois et al. 2006). Although all the news photos used in this experiment were pretested among participants from both cultures and only photos that were universally rated through self-report as either intensely positive or intensely negative by all participants were utilized as stimuli, the ratings on the emotion valence given by the participants do not necessarily predict the level of impact of the images. After all, emotional valence, as an important “heuristic” is one of many factors present in information an image delivers. When the cultural elements in an image are prominent, a negative Chinese face may affect memory more than a negative European American face

to a Chinese reader, prompting the reader to quickly seek out the central information of what exactly happened in the news, leaving out the less important peripheral details. In other words, it prompts the reader to read the text less comprehensively, at the expense of peripheral information.

The memory findings can possibly serve as a springboard for more research on news content that adopts the distinction between peripheral and central information. While it is a widely accepted approach in psychological research on emotion and memory, it is not often seen in journalism studies. In the persuasion literature, the figurative “central and peripheral” paths of persuasion in Cacioppo and Petty’s Elaboration Likelihood Model (ELM) (1989) has gained great attention and interest. In their model, in the processing of persuasive messages, “central” means elements of rational, narrative text, whereas “peripheral” refers to information such as the physical attractiveness of the source. Unlike the ELM, this study proposed a more literal definition of “central” and “peripheral” information in the news context, in the hope of offering new opportunities to researchers to find out what exactly online users take away from the news they read.

#### The Complex Interaction between Culture and Emotion on Memory.

It seems likely that the relationship between the emotion heuristic and the culture heuristic are interrelated. As reviewed earlier, from a dimensional tradition, research found that Asians are more likely to remember the peripheral information better than Europeans (e.g. Masuda and Nisbett, 2001). The dynamic constructivist perspective, when primed with the Asian culture, people, especially the bi-cultural and multicultural

individuals tend to switch to an Asian frame of mind and thus attend to more peripheral information. These studies give support to the idea of a culture heuristic.

However, what this dissertation found is that when emotion is intense (the images selected were all highly intensive, as indicated in the method section), participants from the two cultures demonstrated a similar memory pattern: when primed with intense negative emotions with images of others from the same cultural group, people were less likely to remember peripheral supporting information in the news text. Therefore, the differences in memory specificity due to cultural differences were, to some extent, affected by the valenced emotion.

From a functionalist perspective this makes sense. As Hebb (1995) pointed out a half century ago, increasing information intensity helps cognitive performance, but only to a point. He proposed that highly intense stimuli would lead to information overload, and hurt cognitive performance. In this state the idea that the organism will focus on salient stimulus features at the expense of other information (Hebb 1955).

While trying to isolate the variance of interrelated variables can be problematic, it stands to reason that emotion and culture would have a great deal in common. Pursuing research into the interaction between the two ought to be productive into making cultural comparisons about media consumption and examining the interaction between such basic cognitive processes in general.

### *What Readers Attribute News Events to?*

Emotional Valence Matters.

Almost any theory about the effects of news has to begin with the basic question of what readers remember about a news event. However, how participants assess the news perhaps is more consequential and predictive of predispositions about the news topics and lead to possible behavioral changes. This study (see RQ2) asked whether there would be a carry-over emotional impact of a news image on the attribution assessment of news events described in the news text. The data revealed a significant main effect of emotional valence on attribute styles. Specifically, negative news images made readers from both cultural groups four times more likely to attribute the news event to situational factors, meaning, for instance, when readers were given a negative news image of a drunken student, they would be much more likely to attribute binge drinking to a campus environment that condones drinking.

The traditional attribution-emotion-action model (Weiner, 1980) places attribution as precedent appraisal process for emotions. It suggests that after viewing an object, people make an attribution assumption and then this appraisal guides their emotional reaction. However, work grounded in the information processing paradigm paints a much more complex picture. For instance, Zajonc (1984) argues that affective reactions to a stimulus can be established without the apparent participation of higher-level appraisals such as attribution. This study furthers Zajonc's claim by suggesting that emotion could be a significant determinant of attribution assessment made about a subsequent event.

#### Culture Moderates Effect of Emotion on Attribution.

Besides emotion, this study also inquired about the role of culture on attribution from both the dimensional and dynamic constructivist perspectives (see RQ4a), since culture was found to be an important force shaping attribution judgment as reviewed earlier.

Chinese and European Americans would make consistently different attribution judgments on news events, as predicted by previous research. The previous research suggested that Asians are more likely to adopt a situational attribution style than European Americans (see Morris and Peng, 1994; Masuda and Nisbett 2001). The data did not show a significant main effect of the participant's culture on attribution styles, which would lead to the conclusion that Chinese and European Americans make similar attribution assessments about the news stories they read.

From a dynamic constructivist point of view (see RQ4b), the cultural identity of the individual(s) in the news photo (image culture) could prompt readers to switch between cultural mindsets, for instance adopting a situational attribution judgment when seeing a Chinese image. While the experiment did not find a main effect of image culture, it did find image culture as a significant moderator on the effect of emotion. In other words, there was a significant interaction effect between image emotion and image culture on reader's attribution assessment of the news story.

This further suggests a complex interrelationship between emotion and culture. Figure 14 shows that overall participants were more likely to attribute the news event to external environmental factors when they first saw negative images, but this phenomenon was significantly more noticeable when the image portrayed a Chinese individual. When

the image was negative and portrayed Americans, the preference for situational attribution over dispositional attribution was minimal.

Most previous research that employed the dynamic constructive or the dimensional approach to studying culture's effect on attribution found significant differences between Europeans and Asians (e.g. Masuda and Nisbett, 2001; Morris and Peng, 1994; Norenzayan, Choi et al, 1999). What the current study found is that in the online news context, emotion elicited by news images may play a greater role than culture, yet image culture does modify the strength of the effect of emotion on the attribution judgment.

Too often research into the issue of the effects of culture on media done at higher levels of analysis work from untested assumptions about how individuals processes those messages. This study set out to help fill that gap by validating the effect of culture in the context of emotion.

#### Dynamic Constructivist View of Culture.

Overall, the traditional dimensional approach to conceptualizing culture as a factor in psychological processing did not yield significant findings, whereas the dynamic constructivist approach turned out to be more fruitful. Different images with salient cultural elements did have significant effects on how readers process the subsequent news text. This indicates that there was a working mechanism through which specific pieces of cultural elements in news images could become operative in guiding the construction of meaning from accompanying news text.

Hong et al. (2001) claimed that the variance across cultural groups probably resides in the relative accessibility of a particular implicit cultural theory/heuristic, not in

whether an individual possesses a cultural theory inherently. This dissertation lends support to this argument by demonstrating that accessibility of certain culture heuristics caused by the priming of related elements could be more powerful than the “cultural baggage” the participant brought to the experiment. It also took previous research employing a dynamic constructive view of culture a step further by showing that even “mono-cultural” individuals were able to adopt a “non-native” cultural heuristic, if it was “fed” to them. Perhaps, “mono-cultural” is a misnomer in itself, and that in a complex globalized post-modern urban environment everyone is a little bit multicultural.

#### *Additional Findings*

##### Image Memory.

This study took a look at how the news images themselves were remembered, although this is not the primary focus of the study. The data showed a more complicated picture than most people might expect. Emotional valence did play an important role in how well an image was remembered, but its influence was not so dominant when the cultural element was salient. There was a significant interaction effect between image emotion and image culture on the recall latency of the news image, which is generally used to measure mental effort.

It was found that an image was recalled the fastest when it portrayed Chinese and displayed a negative emotional tone among both Chinese and Americans. Perhaps to Americans, a negative image about Chinese might signal something novel, thus prompting more attention and better memory. Why the same image is the best remembered among the Chinese themselves remains an open question.



The study also tested latency of recall for a news image among both Chinese and European American participants. Interestingly, the Chinese participants took a longer time to recognize an image and their memory accuracy of whether they just saw an image in the stimulus overall was slower than Americans. This would indicate that Chinese participants were spending more mental effort, reflected by their latency scores, but remembering specific information less well than their European American counterparts. These findings might be counter-intuitive. Some recent studies might offer some insight into why this happened.

A recent study (Stanley, Zhang et al. 2013) confirmed that Chinese participants were influenced by, and attend more to, contextual information than Americans. Given their findings, it is possible that the reason why Chinese participants in our study took a longer time to recognize an image is that they not only tried to match the focal person in the image with their memory as did their American counterparts did, but they also tried to contrast the contextual visual information in the given image with the contextual information they remembered seeing. This effort not only required more time but also created the increased chance for mistakes. Thus, it may be a mistake to rank one cultural group as better or worse than the other on the memory task. An alternate explanation could be that the two groups were processing the emotional and cultural information *differently*. For instance, perhaps although the Chinese participants did not do as well in recalling if they saw an image, they would have done better if the task had asked them to match the focal object with its background. A review of literature showed that Asians and Europeans store information using different mechanisms. The Asians tend to remember more of the associative relations between objects, whereas the westerners remember more

of the attributes of the focal objects (i.e. Nisbett and Miyamoto 2005). This might be why the European Americans did better in straightforward recalling tasks. This observation also raises questions about recognition tests of images or texts are always reliable in assessing participants' memory of a stimulus, considering the cognitive differences induced by culture.

#### Overall Rating For Emotional Valence of News Text.

This study also found that while participants rated the news images as either very positive or very negative, their rating for the emotional valence of the news stories was not affected by news photos. This is important, because it shows that the differences in memory and assessment were not likely to be a result of the emotional tone of the news text itself. This finding suggests that the so-called *redundancy* literature may need a more careful examination.

#### Limitations and Future Studies

Although it is unlikely that a Chinese face was seen as demonstrating European American cultural elements, it would have been ideal if this study had pretested the cultural categorization of the news images like it did for the emotional valence.

This study may be one of the first of its kind to make a distinction between “peripheral” and “central” news information in this context. Even though the criteria delineating them were derived from a strong body of research, this distinction in the news context is still exploratory in nature. In order to reduce ambiguity, this study only contrasted core news information such as what happened and why (i.e. why Obama supports same-sex marriage according the news story) with unarguably trivial

information, which if taken out would not affect the news storyline (i.e. what is the percentage of the Chinese population that supports same-sex marriage).

The current study to a great extent demonstrated that internalized cultural heuristics by priming could be an effective antecedent variable in cross-cultural media psychology research. Future studies on news images' influence on text processing can utilize the dynamic constructivist approach to examine other aspects of the differences in cognitive processing between Europeans and Asians, such as their different reactions to contradictions. Previous research showed that Asians have little discomfort with contradictions and even show tendency to appreciate them, whereas Westerners are much less comfortable with ambiguous conditions and tend to pick a side (see Peng and Nisbett 1999; Nisbett 2003). This aspect is particularly relevant to journalism, as news is reported mostly in a balanced manner, which often describes facts about opposing sides. If the Chinese are more comfortable with conflicting facts and embrace them, whereas Americans tend to adopt a side, how would this difference in cognitive processing caused by culture affect attitudes, opinions and even behaviors? Future studies exploring the cross-cultural differences in processing opposing information in news reporting are very likely to yield interesting results.

Another interesting opportunity would be to examine what specific element users remember in the visual images and compare that with their performance on recall for the accompanying text. Will Chinese readers remember more visual context than American readers? When showing a news image about the Chinese, will Americans be prompted to see more details in the visual background? If these hypotheses were supported by data, what would it mean to journalists, especially photojournalists who travel around the

globe to captures images for the world readers? To put the idea even further, would it make a difference to American and Chinese readers, if the news image is placed on the side of a website rather than the center? Based on the current literature, it seems that the location of the image will probably have a bigger impact on memory for Americans or people who are primed to think in a western way.

This study also calls for further research on the effect of emotion-laden news images on the psychological processing of news text. News images very often are highly emotional and they almost always appear with news text. The influence carried from one to the other should not be overlooked. Theoretically, it expands the literature, which traditionally compares one mode with the other or examines how one compensates or impairs the processing the other. It also provides practical and meaningful guidance to daily news reporting.

Scholastic attention could also be paid to the influence of new technologies. The current study looks at the interaction between news photos and texts in online news from a computer interface. It would be interesting to see if the same psychological patterns exist when people are using mobile devices to read news. Another variable that can potentially be brought into this research area is gender.

## Chapter 5: Conclusion

A study of how emotional and cultural elements of a news image affects the way people remember and assess accompanying news text is of central relevance to journalism studies. It addresses three major aspects of news processing: First, the carry-over effect from news images to news text identified in this study alerts researchers that images and texts are two information channels which interact with each other during very early stages of cognition and often below user's conscious awareness. News photos and stories together tell a more complete picture of a news event, but the order of their presentation can shape the memorization and assessment of the news information. This suggests that the current layout of most online news stories has significant effect on the way news text is read. When asked if the images interact with accompanying text, a news photographer or an editor will surely say they do. However, that knowledge is based largely on their intuition. Giving them guidance based on empirical research would only enhance their judgment.

Secondly, the increasing amount of cross-cultural news reporting makes the cultural elements as well as the cultural identity of the readers unprecedentedly important to journalism researchers. This study found that the user's cultural identity might not be as important as the cultural elements embedded in the news itself and determine the normative framework implicit cultural mindset (or theory) one adopts. Striking similarities were discovered among Americans and Chinese in their processing of news information overall, when they were primed with similar cultural elements in news images. What this suggests is that culture may not necessarily be as static a concept as

many researchers might think. By contrast, it can be dynamically constructed at a psychological level within a short time with a “primer” and can temporarily become operative in guiding the construction of meaning from news content. Given this, it should be meaningful to re-consider the traditional approach to conducting cross-cultural research, which mainly adopts the dimensional perspective. Perhaps, everyone can be “temporarily” multicultural.

In previous cross-cultural research, image primers were used as an experimental tool. However, in the context of online news context, news images are often unavoidable. These natural cultural primers deserve more attention in journalism research. The news photographs from Syria portraying women and men in the Syrian civil war swept this year’s Pulitzer Prize in breaking news photography. These photos taken from another region of the world not only send out compelling emotional messages, but also strong cultural signals. These cultural cues in the images can be as important as the emotional elements in their power to shape how the accompanying news text is processed and communicated among readers.

Third, emotion plays a critical role in memory and assessment. Emotion valence alone could have a significant impact on what news consumers attribute a news event to. This attribution judgment can prompt one to adopt an opinion over another and perhaps even a vote over another. In other words, the emotional cues in a news image can be quite consequential.

Together with culture, emotion could “narrow” or “broaden” memory of the information. News is to inform not to persuade. Findings in this dissertation urge journalism researchers to reconsider the role of news images. Perhaps persuade is too

strong a word, but images undoubtedly shape or frame subsequent text. Are images simply standalone attention grabbers or do they contribute to storytelling process? As the intensity of emotions reaches some threshold level, are they telling a story not explicitly intended in the textual component of the story? This becomes especially problematic given the drastic staffing cuts news organizations have made during the last decade or so.

The practical reality of much international news is that it is being reported by local nationals or stringers, who may not have insight into how the material they collect will affect users in different and a distant cultural milieu. While the reach of news from large news organization, such as CNN, may have a global reach and be filtered to fit what editors believe is appropriate for the complex and diverse cultural context, the fact is that more often than not the editing and propagation of content continues to be highly centralized.

For instance, a local national stringer may collect information about an event in Japan, which will then be transmitted to Atlanta for editing, packaging, and then broadcast back to Japan. This is a reality. Very often the stories journalists send to culturally and geographically distant newsrooms frequently return to their point of origin with entirely different, and even culturally inappropriate meaning than those originally intended. An image of the person who stood in Tiananmen Square in front of the tanks was interpreted entirely differently in U.S. press (brave individual standing up against the powerful forces of government) and in China (Army shows restraint in not doing the protestor any harm).

This study goes further by showing perhaps seeing a Chinese face in a picture is enough to trigger two significantly different cognitive processes for the Chinese and

European Americans. The bottom line is that whether understaffed news organizations like it or not, the world and the news it generates will only become more complex as in the face of the relentless forces of globalization.



## Appendices

### Appendix A: Experiment Stimuli

#### **Alcohol on campus, Just Part of College Life or a Substance Abuse Problem?**



As a new semester begins, the perennial debate about alcohol use on campus heats up again. Even though some health officials see it as a chronic physical and mental health issue, the fact is that the vast majority of students report having a drink or two from time to time.

Studies show that college drinking contributes to an estimated 1,400 student deaths, 500,000 injuries and 70,000 cases of sexual assault or date rape, according to the National Institute on Alcohol Abuse and Alcoholism, a part of the federal National Institutes of Health.

"Half of all non-disease related health issues among the young people are alcohol-related and happen on college campuses," said Mark Goldman, a psychology professor at the University of South Florida who studies the problem.

On the other hand, most students see drinking as part of college life. "Sure some people go too far and get hurt, but I think that has more to do with the problems they bring with them from home than it does the availability of alcohol," said Sandy Johnson, a junior at major state university, "In the eyes of the law we are adults, capable of making important decisions, such as voting in elections and serving in the military." He also said, "We all know most are parents do the same thing, why not crack down on them"

Nevertheless universities pouring millions into programs to crack down on "binge drinking," the practice of consuming large amounts of alcohol over a short period of time, usually during the weekend. However, such efforts seem to have had little effect on student behavior over the past decade.

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## Gay Marriage Spreads across the Globe like Wildfire, but Some Still Have Their Doubts



**(242 words)** Liberals cheered U.S. President Barack Obama's announcement Wednesday that he now backs gay marriage, but social conservatives dismissed the move as an election-year ploy and continue to express concern about what they see as the deterioration of core social values.

Obama says he has concluded that it is important for him to affirm that he thinks same-sex couples should be able to get married. Vice President Biden said on Sunday he was "absolutely comfortable" with allowing same-sex couples to wed.

However, Obama's position puts him squarely at odds with that of Mitt Romney, the presumptive Republican nominee for president, who has said marriage should be between a man and a woman.

Romney called the issue of gay-marriage "very tender and sensitive topic," at a campaign stopover in Oklahoma. Romney is a devote Mormon, a religion that stresses "traditional family values," and has taken a strong stand against homosexual relationships generally.

In a Gallup poll conducted in America between May 3 and 6, 50% of Americans said they backed same-sex marriage, while 48% said it should not be legalized. The United States is not the only country in the world wrestling with the issue. For instance, Mexico, a predominantly Roman Catholic country, also recently legalized gay marriage. Even in China the topic has become an issue for public discussion. A poll conducted in 2009 showed that over 30 percent of the Beijing population supports same-sex marriage, while the rest were unsure or opposed.

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## **The Mixed Blessing of Increased Economic Ties between China and the United States**



As trade between the United States and China increase, so does the complexity of problems that go along with it. For instance, already strained trade relations between the world's largest economies will be further tested this year as the United States weighs “anti-dumping” duties on a range of Chinese products.

“It’s not a new strategy,” said one U.S. official privately. “One country sells a product at or below cost until it dominates a market, then it is in a position to run prices up.”

The U.S. government will decide whether China-made solar cells, high-pressure steel cylinders, galvanized steel wires and steel wheels from China are dumped, or sold below cost, in the United States. The U.S. imported \$1.5 billion worth of solar cells from China in 2010.

However, the Chinese government sees the issue in a different light. A representative with the Chinese Ministry of Commerce, said on background that the truth is that China simply produces superior products at more competitive prices. Meanwhile, China has launched its own investigation of American solar cell makers, and is also probing such U.S. industries as photographic paper.

Last year's collapse of the high-profile California-based solar-panel company Solyndra, which received \$535 million in government loan guarantees, highlights the industry's problems.

U.S. Energy Secretary Steven Chu testified that falling solar cell prices and aggressive competition from Chinese companies had taken a toll on the financial health of Solyndra and other American companies. Yet, if the U.S. government imposes tariffs on Chinese solar cell makers the fear is that a tit-for-tat trade spat could turn into an all-out trade war. That could hamper trade and hurt manufacturers in both countries.

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The World Bank Monday chose 52-year-old Korean-born American health expert Jim Yong Kim as its 12th President, according to an announcement from the organization.

Kim said he would work to ensure that the World Bank "delivers more powerful results to support sustained growth; prioritizes evidence-based solutions regardless of ideology; and draws on the expertise and experience of the people we serve."

Kim's background as a physician and anthropologist make him a somewhat unusual choice for the top slot in the bank, which usually chooses experts with a background in global finance and economics. He beat out Nigeria's widely respected finance minister, Ngozi Okonjo-Iweala.

Kim have considerable support in countries with emerging economies because of his sensitivity to developmental needs which focus more on medical and poverty eradication. He is known for his data-driven approaches and rigorous evaluations that effectively identify and solve public health problems.

“World Bank is a bank that’s focused on economic development and poverty alleviation,” Kim said. “I’ve spent my entire life working to invest in human beings and human communities, to help them move down the path of economic development.”

However, some aid experts worry about his lack of experience in broader economic development, given that he has focused intently on public health. And one of his scant pieces of public commentary about macroeconomic development directly criticizes the World Bank’s approach. Critics of the decision point out that the World Bank presidency has gone to a U.S. backed candidate since the organization was founded at the Bretton Woods conference at the close of the Second World War.

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(Sample Chinese Stimuli)

## 中美贸易 祸福相依



随着中美贸易合作的增进，产生的问题也日渐复杂。美国将于今年考虑对部分中国商品实施“反倾销”税。这将给本已紧张的中美贸易关系带来更大挑战。

美国某官员匿名表示：“倾销并不是什么新鲜的贸易手段。一个国家以低价或亏本的方式将某一产品卖入其他市场。直到完全占领这个市场后，再上调价格”。

美国政府将要决定是否从中国购入的太阳能电池、高压钢瓶、镀锌钢丝和钢轮都是倾销产品。美国在 2010 年从中国收购了 15 亿美元的太阳能电池。

然而，中国政府的看法有所不同。中国商务部官员表示中国生产的产品不但有更好的质量还有具有竞争力的价格。中国与此同时正在调查美国的太阳电池生产商和照相纸等产业。

Solyndra 是一家位于加州的著名太阳能板公司。它曾获得美国政府五亿三千五百万的政府担保。去年该公司的倒闭暴露了美国太阳能产业的问题。

美国能源部部长朱棣文说，来自中国的激烈竞争和一直下跌的太阳能电池价格确实让像 Solyndra 这样的美国公司吃不消。但是，如果美国对于中国太阳能电池增收关税，本已争锋相对的局面有可能走向不可收拾的贸易战。这样不仅会阻碍贸易，还会伤害两国生产商的利益。

## 世界银行委任新主席 任命人选出人意料



根据世界银行周一的最新消息，美籍韩国人，52岁的健康专家金墉被选定为世界银行第12任行长。

金墉说他将会努力让世界银行“更有力地支持可持续增长，依成效办事，不受限于国家间意识形态的不同。发挥好世行所服务的人民自身的特长和经验”。

世界银行往往委任具有国际金融和经济背景的专家为行长。金墉是一位医生和人类学家。这次的任命有些异乎寻常。他战胜了颇具声望的尼日利亚财政部长恩戈齐·奥孔约·伊维拉。

金墉的当选得到了众多新兴经济国家的支持。这些新兴经济体对医疗和消除贫困方面非常关注，而金墉对于这些发展需求有十分敏感。他常采用数据为基础的方式和严格的评估系统来有效发现和解决公共健康问题，并因此著名。

“世界银行是一家专注于经济发展和消除贫困的银行”金墉说，“我一生的工作都在关注人类和人类社区，并帮助他们找到经济发展的道路。”

然而，很多援助专家担忧金墉一直关注公共健康领域，因此缺乏经济发展方面的经验。在他仅有的几次关于宏观经济的公开评论中，他都是直接批评世界银行的。关

于这次任命的批评者还指出，自从二战后世行由布雷顿森林会议成立后，每一任世行行长都是美国支持的人选。

Appendix B: Experiment Questions

**Topic one—World Bank**

**Q1(Central):** What reason was given in the article to support Jim Kim's selection?

- A. He is sensitive to developmental needs which focus on medical and poverty eradication.**
- B. He wants to lower interest rates to emerging economies.
- C. He will spend the next few years developing industrial infrastructure in developing countries.
- D. He will foster projects which will strengthen the middle class in developing countries.

**Q2(Central):** What is a reason that some experts use to criticize the selection of Kim?

- A. Kim's emphasis on public health does not fit the traditional World Bank's model of problem solving.**
- B. World Bank experts worry that Kim will over spend resources.
- C. Kim's data-driven approaches to problems will overlook some key issues in the effort to eradicate poverty.
- D. Kim's call for tightening up the excessive internal spending.

**Q3(Peripheral):** Kim was selected because of the diversity of his professional background as \_\_\_\_\_?

- A. A physician and a historian
- B. A physician and an economist
- C. A physician and an anthropologist**
- D. A physician and active in politics

**Q4(Peripheral):** Who is the other candidate that could have been chosen over Kim according to this article?

- A. Ambassador to the United Nations, Susan E. Rice
- B. Nigeria's finance minister Ngozi Okonjo-Iweala**
- C. Former Colombian finance minister, Jose Antonio Ocampo
- D. Chinese Foreign Minister, Jiechi Yang

**Q5(attribution style)** What do you think was the biggest factor in Jim Young Kim's selection for the World Bank presidency:

- A. The United States backed Kim.
- B. Kim's hands-on experience in dealing with poverty and health.

### **Topic two: Alcohol Consumption**

**Q1(Central):** What is a reason used by the interviewed college students to support the consumption of alcohol on campus?

- A. Most parents drink, so as adults they should be allowed to drink too.**
- B. Drinking is the only way to socialize.
- C. There is no law prohibiting alcohol consumption by college students.

D. The impact of drinking on campus is exaggerated by the media.

**Q2(Central):** According to this article, why should universities take serious actions against student binge drinking?

A.College drinking contributes to thousands of student deaths according to a study by FDA

B.College students have a drink or two time to time.

**C.Half of all non-disease related health issues among the young people are alcohol-related**

D.Drinking affects students' ability to study.

**Q3(Peripheral):** One of the interviewed student says that drinking too much alcohol is more a result of \_\_\_\_\_?

**A. problems students bring with them from home to school**

B. a campus culture which makes drinking look cool

C. universities' lack of effective methods to curb binge drinking

D. Students being too young to control themselves.

**Q4(Peripheral):** How much money universities pour into programs to crack down on "binge drinking," according to this article?

A. Ten thousands of dollars

**B. Millions of dollars**

C. Ten millions of dollar

D. They don't have enough money to use for this campaign.

**Q5(attribution style):** What do you think is the biggest factor that leads to binge drinking on campus?:

A. A campus environment that condones drinking.

B. Students lack self-discipline.

### **Topic three: Gay Marriage**

**Q1(Central):** What did President Obama say to support gay marriage?

A. He says that the idea of same-sex marriage is not against the Bible.

**B. He says that same-sex couples have the equal right to wed.**

C. He says same-sex marriage should not be seen as the deterioration of core American values.

D. He says that homosexuality was not a problem to societies in the ancient human history.

**Q2(Central):** According to this article, why was Obama criticized by social conservatives?

**A. Conservatives think that his move about gay marriage is just an election-year ploy.**

B. Conservatives think that Obama made the statement to support Vice President Biden who favors gay marriage.

C. Conservatives think that Obama betrays his Christian beliefs.

D. Conservatives think that Obama is an incapable president.

**Q3(Peripheral):** What is the percentage of the Beijing population that supports same-sex marriage?

A. 25%

**B. 30%**

C. 42%

D. 50%

**Q4(Peripheral):** How many Americans are against gay marriage according to a Gallup poll?

A. 25%

B. 38%

**C. 48%**

D. 53%

**Q5(attribution style):** What do you think is the biggest factor that contributes to Obama's decision to support gay marriage:

A. It will increase his popularity among a key group of supporters in the upcoming election.

B. He is truly committed to the idea of marriage equality.

**Topic four: Trade with China**



**Q1(Central):** Why is it important to consider carefully before taking action against China in the Sino-US trade relationship according to this article?

- A. It is not entirely clear whether China is really “dumping” their products in the States.**
- B. China is producing superior products in some industrial areas.
- C. China will in return impose high tariffs on US products.
- D. Chinese consumers will stop buying things from the States.

**Q2(Central):** Why do some people think Chinese imports hurt the U.S. economy?

- A. U.S companies can’t compete with higher-quality Chinese products.
- B. The U.S. is growing too dependent on the imported Chinese goods.**
- C. Chinese products are all sold unfairly below their real production cost.
- D. Many of the Chinese goods are counterfeit products.

**Q3(Peripheral):** How much were the solar cells the United States imported from China in 2010 worth?

- A. \$10 million
- B. \$1.5 billion**
- C. \$10 billion
- D. None

**Q4(Peripheral):** What other product does the U.S. suspect is being “dumped” by China?

- A. Metallurgical products

- B. Kitchenware
- C. Photographic paper
- D. Galvanized steel wires**

**Q5(attribution style):** What do you think is the biggest factor that led to the fall of some American solar panel companies:

- A. The threat from Chinese products.
- B. The American solar panel industry was not competitive enough.

**Test 3: Emotion Valence Question:**

We would like to ask you a few questions about the news you just read now.

Please rate the emotion you felt when you read the TEXT, as soon as you decide, using the keys on the white button box. Remember there is no right or wrong answer about your feeling. Please press any key for the question.

1) What is your take on STUDENT DRINKING after reading a story about it?

- A. Strongly against it
- B. Against it
- C. Neutral
- D. In favor of it
- E. Strongly in favor of it

2) In what light do you think the story on STUDENT DRINKING portrays the issue?

- A. Extremely negative

- B. Negative
- C. Neutral
- D. Positive
- E. Extremely positive

**End Test: DEMOGRAPHIC QUESTIONS**

1. What was your age on your last birthday?

- A. 18-20
- B. 21-30
- C. 31-40
- D. 41-50
- E. Same or over 51

2. What is your gender?

- A. Female
- B. Male

3. What is your race/ethnicity?

- A. White
- B. Black
- C. Latino
- D. Asian

E. Multiracial

4. How much time did you spend reading/watching news last week?

A. Not at all

B. Less than an hour

C. 1-2 hours

D. 2-5 hours

E. 5-10 hours

5. How often do you read news from international news organizations?

A. Never

B. Rarely

C. Sometimes

D. Often

E. Quite frequently

6. Do you think that the international news organizations are more credible than your domestic media outlets?

A. Strongly agree

B. Agree

C. Neutral

D. Disagree

E. Strongly disagree

7. How long have you lived in the United States?

- A. Less than a month
- B. More than month to a year
- C. 1-5 years
- D. 5-10 years
- E. All my life

8. How frequently have you travelled to a foreign country in the last 3 years.

- A. Never
- B. Once or twice
- C. Several times
- D. On regular basis

9. Are you married?

- A. Yes
- B. No

Appendix C: IRB Approval Letter



UNIVERSITY OF  
MARYLAND

1204 Marie Mount Hall College Park, MD 20742-5125 TEL 301.405.4212 FAX 301.314.1475 irb@umd.edu  
www.umresearch.umd.edu/IRB

INSTITUTIONAL REVIEW BOARD

DATE:

TO: FROM:

PROJECT TITLE:

REFERENCE #: SUBMISSION TYPE:

ACTION: APPROVAL DATE: EXPIRATION DATE: REVIEW TYPE:

REVIEW CATEGORY:

September 6, 2012

John Newhagen, PhD University of Maryland College Park (UMCP) IRB

[371124-1] CROSS-CULTURAL EXAMINATION OF EMOTION AS A  
FACTOR IN INFORMATION PROCESSING OF PROBLEMATIC NEWS  
ISSUES ONLINE

New Project

APPROVED September 6, 2012 September 5, 2013 Expedited Review

Expedited review category # 7

Thank you for your submission of New Project materials for this project. The University of Maryland College Park (UMCP) IRB has APPROVED your submission. This approval is based on an appropriate risk/benefit ratio and a project design wherein the risks have been minimized. All research must be conducted in accordance with this approved submission.

This submission has received Expedited Review based on the applicable federal

regulation.

Please remember that informed consent is a process beginning with a description of the project and insurance of participant understanding followed by a signed consent form. Informed consent must continue throughout the project via a dialogue between the researcher and research participant. Federal regulations require each participant receive a copy of the signed consent document.

Please note that any revision to previously approved materials must be approved by this committee prior to initiation. Please use the appropriate revision forms for this procedure which are found on the IRBNet Forms and Templates Page.

All UNANTICIPATED PROBLEMS involving risks to subjects or others (UPIRSOs) and SERIOUS and UNEXPECTED adverse events must be reported promptly to this office. Please use the appropriate reporting forms for this procedure. All FDA and sponsor reporting requirements should also be followed.

All NON-COMPLIANCE issues or COMPLAINTS regarding this project must be reported promptly to this office.

This project has been determined to be a Minimal Risk project. Based on the risks, this project requires continuing review by this committee on an annual basis. Please use the appropriate forms for this procedure. Your documentation for continuing review must be received with sufficient time for review and continued approval before the expiration date of September 5, 2013.

Please note that all research records must be retained for a minimum of three years after the completion of the project.

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If you have any questions, please contact the IRB Office at 301-405-4212 or [irb@umd.edu](mailto:irb@umd.edu). Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within University of Maryland College Park (UMCP) IRB's records.

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