Photography in the Field: A Content Analysis of Visual and Verbal Narratives in
National Geographic Magazines

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ABSTRACT

It is undeniable to claim that we live in a visual world. The introduction and developments of the digital camera have had a tremendous impact in many facets of society. This study focuses on the impact of visual communication, namely through *National Geographic* magazines. The power of visual communication is becoming increasingly evident in its ability to instantaneously connect the viewer with a thought, a challenge, or even a memory that could be followed by an emotion. Evidence has found that memory, learning, and emotional incitements are created or retrieved by the simple use of a photograph.

National Geographic, a widely popular magazine publication, understands this power and harnesses its potential by focusing on the quality of its images and combining them with text to create a two-part narrative for its viewers. Marketing studies show that 53% (p.82) of subscribers read only the picture captions (Lutz & Collins, 1993) of *National Geographic* magazines. This finding lends itself to more investigative research in the approach that *National Geographic* uses in their magazines.

The research portion of this study first focuses on the success of *National Geographic* and how it has come to be respected and viewed by millions (*National Geographic*, 2012). It is then examined through several points of research how photographs affect humans on a societal, cognitive, and emotional level. Combined in this research is a discussion on narratives and how humans create a sense of personal and shared meanings through stories. These two separate focuses of research are joined together in this process as specific findings are analyzed and examined in the visual and textual content of the *National Geographic* magazines.

The results of this study found that the approach of *National Geographic* relies *heavily* on the use of their photographs. Prior to the analysis, specific themes were chosen to organize and

categorize the visual and textual narratives in each story. The results of the analysis indicated that for some of the stories analyzed that opposing themes were found in both the visual and textual narratives, indicating that a different story can be found if the reader focuses on only the photographs or only the text in each story. In addition to this finding, two separate methods were used, one to test for correlation and the other to test for a direct relationship between the photographs and the text in each story. Results found that some of the stories there was a direct relationship; however, this was not found in all of the stories. It was surprising to find that not all of the stories had a direct relationship between the photographs and the text.

Finally, the last finding in this study was not included in the original research questions as it was a phenomenon that occurred during the analysis. The coders took note of the complexities of some of the visual and textual narratives in the stories as some of them were significantly more difficult to code than other stories as they contained more than one theme in each visual and textual portion. This occurrence was included in the analysis as the methods were modified to include this. The results showed that while some of the stories in the analysis contained only one theme for the narrative and textual portion, a significant amount of the stories analyzed contained two and three different themes in each story. These stories were named "multi-dimensional" and were given the same treatment of analysis as all of the other stories in the analysis.

The limitations of this study are found in the strength of the relationship between the visual and textual narratives. One hundred and eighteen stories were analyzed in order to achieve validity in the statistical results. To maintain quality of this analysis, coders were trained to only find one piece of evidence that implied a direct connection between the photographs and the text.

Future research in this area could focus more on the extent of the relationship between the two modes of communication.

Photography in the Field: A Content Analysis of Photography in

National Geographic Magazines

For individuals who appreciate the effectiveness and strength in a photograph, the quote,

"A picture speaks a thousand words" can be understood. Pictures can be universally identified

throughout the world, regardless of a person's native language. They can just as easily be

misinterpreted; however, with the accompaniment of a brief caption or even a full story, the

picture can take on a whole new value of meaning and interpretation. *National Geographic*

understands this and uses the power of a photograph to its full capacity. Its use of photographic

coverage in different parts of the world is both informative and awe-inspiring.

For a magazine publication that is currently celebrating its 125th anniversary this year,

one might ask what the secret is to this extremely successful and profitable business. *National*

Geographic is unique in its approach to presenting the story content not just through words but

through visually-magnetic photographs. Marketing studies show that 53% (p.82) of subscribers

read only the picture captions (Lutz & Collins, 1993). In a world that is becoming increasingly

visual, images are becoming a huge force of communication. While the text in *National*

Geographic magazines describes dates, facts, and names the photographs have clearly been a key

factor to the success of *National Geographic* magazines.

National Geographic was created in 1888 by a group of 33 members whose goal was to

"increase and diffuse geographical knowledge" ("*National Geographic*", 2013, p. 22). The

society pioneered the use of color photographs and was the first magazine to go all-color.

Alexander Graham Bell, inventor of the telephone and a founding member of the *National*

Geographic Society, pushed for the story content in the magazine text to be adapted to the

photographs. Gil Grosvenor, president and chairman for *National Geographic* says, "I suspect

we became popular because we went digital. We have managed to stay on the cutting edge of

visual image ever since" (Cook, 1991, p. 43).

Profits from the society have gone supported research grants in the amount of $153

million, recorded in December of 2011 ("*National Geographic*", 2013). The magazine

publication was ranked the seventh largest in the U.S. in 2012 and currently circulates 4,001,937

magazines (abcas3.auditedmedia.com/ecirc/magtitlesearch.asp). While *National Geographic* has

been accused of having a "particularly American view of the world, an upbeat, rosy glassed

view" that ignores or minimizes the harsher realities (Raasch, 2013, p. 11), its momentum

appears to be unstoppable. The wave of digital media has only compounded *National*

Geographic's sales and ability to reach wider and greater audiences. It has enabled the magazine

to offer a digital version of its magazine to the media and has branded itself in the world of social

media. In 2012 it was recorded that 19.4 million monthly visitors frequented the *National*

Geographic website, 2.9 million people used *National Geographic* app downloads, 11.7 million

people "liked" the *National Geographic* Facebook page and 2.7 million followed *National*

Geographic on Twitter (*National Geographic*, 2012).

In a YouTube video, David Griffin, photo director for *National Geographic*, discusses

why he believes that the photographs are so impactful to viewers. "Flashbulb memory", he

explains, "is when all the elements come together to define not just the event but the emotional

connection to the event. This is what a photograph taps into when it makes its own powerful

connection to the viewer". He continues to explain that every person has what it takes to create

one or two incredible photographs in their lifetime; however to be a great photojournalist, not

only do you have to shoot excellent photographs all the time, you also have to know how to

create a *visual narrative* through your photographs. He finishes, "I believe that photography can

make a real connection to people and can be employed as a positive agent for understanding the challenges and opportunities facing our world today" (Griffin, 2008).

According to *National Geographic*, their selection of hired photographers is not of a typical photography school graduate. Instead, they will purposely hire photographers in more diverse fields, including: journalism, anthropology, sociology, psychology, fine arts and sciences. Their goal is to possess an eclectic blend of interests, abilities and photographic styles in their photographers (http://www.nationalgeographic.com/siteindex/careers-faqs/). Their struggle for balance in their photographs is quite different from that of basic photograph in a newspaper. A comparison of "spot news" and "point pictures" is addressed in a book by Lutz and Collins (1993). "Spot news" a term used to describe a photograph whose only purpose is to relay information. "Point Pictures", also a photographic term, not only relays information but also uses aesthetics to its advantage as it draws the viewer in and emits feelings and emotions. It is the difference between simply seeing something happening in a photograph and seeing something happen but suddenly feeling like you are there. The photographers at *National Geographic* are trained to take "multi-dimensional" photographs that "show the whole content" (Lutz & Collins, 1993, p.58). In an interview with an editor from *National Geographic*, he explains,

> Point pictures are pictures that serve to illustrate points; they are very literal and simple, like a declarative sentence. Other pictures have poetry, they give you a feel for a thing; they add a whole new dimension to a story. They are not just illustrating the words. Photography can do this especially well- not the facts, but how a thing feels. Not that facts are ignored; photographers have a tremendous knowledge of their subject. But knowledge is not driving everything. The

photographer reacts based on this knowledge, but doesn't go out to illustrate it. It

is not up here [points to forebrain] but further back (Lutz & Collins, 1993, p. 58).

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one might ask what the secret is to this extremely successful and profitable business. *National*

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are becoming a huge force of communication. While the text in *National Geographic* magazines

describes dates, facts, and names the photographs have clearly been a key factor to the success of

National Geographic magazines.

While previous studies have been conducted on *National Geographic* magazines for

reader's interpretations about cultural stories, few studies have been conducted or analyzed for

content between the photographs and the text. In a study by Mendelson and Darling-Wolf (2008)

the emotional effects of content between photographs and text was analyzed. The results showed

that while photographs or text by itself may have negative impact on viewers because they are

not receiving the full story, photographs and text viewed/read simultaneously were able to

challenge cultural stereotypes that viewers previously held (Mendelson & Darling-Wolf, 2008).

This study analyzed the story content and photographs of *National Geographic*

magazines for specific themes in the photographs and text, volume of photographs versus texts,

and found a pattern or association between the photographs and text. The method used in this

study was similar to a content analysis performed by Greenwood and Smith (2007) except that

this study searched for themes that were found on *National Geographic*'s website which have

been used as educational methods. The themes, which are textual and visual, were modified from

the website to more appropriately fit this content analysis. The magazines that were analyzed

were issues between January 2010 and December 2011.

This research hoped to find themes and connections (or lack thereof) between the types of

photographs that were taken and the text provided. It hoped to find whether the photographs

dominate the stories which would indicate that *National Geographic*'s intent is to allow the

photographs to lead the story. It also analyzed the textual portion to find if the text dominated the

stories, which would suggest that the purpose of the photographs is to supplement the text.

Furthermore, it was analyzed to find if the photograph-to-text placement is relatively

proportionate, suggesting that they each lead their own narrative and that valuable information

can be experienced from either approach or that, when read and viewed simultaneously, each

mode of communication strongly supports its counterpart.

Research contributed to the study of *National Geographic* magazines is beneficial

because the level of awareness that the magazines have brought to worldly issues calls for a need

to conduct more investigations to this unique mode of communication. The photograph and

narrative combination are not only informative and educational but the issues are current and

relevant on a universal level. The magazines compel the viewers by their high standard of

photographical images bringing home to the mind of the reader the simple yet complicated truths

in which they are trying to convey.

Literature Review

This chapter focuses on research relating to *National Geographic* magazines, visual processes and narratives. The first part of this chapter will summarize research on *National Geographic* magazines and how they have contributed to the dissemination of information through its unique story/photo approach. This chapter will then discuss how visual input contributes to memory and the learning process through a schematic process. This is further investigated by the dual coding theory which further explains how images are processed differently than text which impacts the viewer emotionally. Finally, this chapter focuses on how narratives help viewers understand and define their social world and process emotional experiences.

National Geographic

National Geographic's approach to disseminating communication is unlike other publications because the stories are narrative on their own. However, with the addition of text and supporting captions the stories in each magazine are truly remarkable. According to Magazine Publishers of America (2006), *National Geographic*'s original mission was the diffusion of geographic knowledge broadly defined to include the world's places, people and cultures. The magazine's unique narrative ability to consistently present photo stories/essay formats is a result of experienced photographers and reporters who stay in the field for lengthy periods to report on places and people around the world and who offer the readers extended visual and verbal views of the world (Magazine Publishers of America, 2006). Mendelson and Darling-Wolf (2009) have found that *National Geographic* uses a two-part process in its magazines where the writer and the photographer work independently of each other when

communicating the same story. This results in a story that can be experienced through the text or

absent of text and through the photos themselves (Mendelson & Darling-Wolf, 2009).

Perhaps *National Geographic* is more aware of the special dynamic between photographs

and text than they are given credit for. According to Hill (2004), pictures and words are

represented differently. Photos more clearly represent the entirety of the subject, while words

take more time to process and elicit a more reasoned response. A person's reaction to a

photograph tends to be more immediate and emotional (Hill, 2004). Kobre states, "Multiple

pictures remain individual images unless they are integrated into a cohesive narrative in which

the selection, theme, and order of presentation transforms the individual photographs into stories

that grab and then hold a reader's attention" (Kobre, 2004).

A statement by David Friend (2006), talks about how photography has become orthodox

or an accepted view of our visual culture:

> I believe… in the power of pictures. I believe that the digital age, as no period
>
> before it, has turned ours into a world awash of visual information. I believe that
>
> in this era of political spin, agitprop, Photoshop, and made-for-TV reality, we still
>
> regard the photograph… as conveying a kernel of truth. And I believe that deep in
>
> our psyches we are constructed like cameras (Friend, 2006).

If real and lived images are becoming an increasingly accepted "kernel of truth" (Friend,

2006) in our culture, then it is easy to understand why *National Geographic* uses this to help us

believe and perhaps even understand practices and events in other cultures. Mendelson and

Darling-Wolf (2009) claim that journalistic articles about culture do have the power to inform

readers and unsettle stereotypes, especially for participants who read the text and view the

photographs. The study also showed that in some cases, pictures are not always effective at

presenting statements that require a lot of explanation (Mendelson & Darling-Wolf, 2009). Coonfield and Huxford (2009) state that the relation between news images and cultural performances is an expressive enactment where people "constitute and sustain their identity and collectively enact their worlds" (Coonfield & Huxford, 2009).

From this point, the concept of performance is enmeshed in the idea that images are lived through cultural performance and it believes that the everyday norm constitutes performance. Coonfield and Huxfield (2009) note that while local news looks to national news for its content and themes, it looks to local rituals and performances for proof of its purpose, for validation of its coverage, and for confirmation of local news' relevance and responsiveness to local cultural life. For example, after the 9/11 attack, the images were relatively immobile. Images of the U.S. flag can take us different places (ie; historical) while images of the 9/11attack takes us to only one day in time (Coonfield & Huxford, 2009). This notion begs for more research in visual communication as it addresses an image's ability to not only be mobile yet consistent through time, it also turns one's mind to the power of an image on the memory and emotional responses.

On the other hand, not all photographic images can necessarily be constituted as cuing the natural emotional responses in a person. Dependent on the content in the image but also to the individual viewer, some photographs seem to contain more attributes that can affect a person more intensely. Finding such an image, however, can prove to be very powerful. According to Greenwood and Smith (2007), the chance of news coverage in urban areas or developing countries is usually dependent upon the type of coverage and the magnitude of the event. Dominance in news coverage in developing countries is usually when they are of disastrous depictions of war and violence or natural disasters (Greenwood & Smith, 2007). This could be because as Pfau and Haigh (2006) note, "war casualty photographs may be the most emotionally

arousing content available" (Pfau & Haigh, 2006, p. 151). Additionally, Trivundza (2008) notes

that many authors emphasize that the content of international news can influence the audience's

knowledge, perception and evaluation of other countries, especially when they have limited

information about international countries and different cultures to begin with (Trivundza, 2008).

Contrary from other magazines layouts that focus on the text with occasional pictures,

National Geographic is unique in their use of photo stories where both the words and photos

carry important information. At times these two modes seem to work independently of each

other; at other times they seem to present separate stories. The expiration and value of a

photograph could be considered timeless, as Mendelson and Darling-Wolf (2009) explain, "a

photo story folds over space and time, over the course of pages, with varying amounts/sizes of

text and pictures. In addition, unlike a television news story, a photo story offers the possibility

of return, reexamination, and/or consideration of earlier portions of the narrative" (Mendelson &

Darling-Wolf, 2008, p. 800).

Cognitive/visual processes

In the early 1900's, advertisements were from elegantly drawn pictures that were

intended to associate the product to a more upper-class lifestyle. Photographs were generally

associated with sensational reporting in newspapers and were not used in advertising. In the

1920's, that changed when photographs began to be viewed as a more modern and truthful

approach to advertising. A publication of Photographer's Association of America stated that

"buyers do not question photographic evidence… They believe what the camera tells them

because they know that nothing tells the truth so well" (Lester, 1995, p. 84).

Increasing evidence has been shown that viewers are more likely to remember the way a story is shown in images than the way a story is written in words (Newton, 2009). People who consider themselves as visual learners are more inclined to learn from visual messages and respond quite differently to photographs than those less visually-oriented (Mendelson & Papacharissi, 2007). In addition those who are visual learners remember details in the photos and are better at organizing visual information; however, that can be a result of individual learning styles (Mendelson, 2004).

Studies have been linked to how images impact the memory and recall of a photograph. This ability is found in different areas of photo presentation, including new and unseen photographs, compelling photographs, and in photographical context in which the participant can develop or has developed an emotional connection to the image. One study, conducted by Mendelson (2001), investigated how the effects of novel images in news photographs affect attention and memory. It was suggested that people hold strong expectations about how the overall appearance of newspaper photographs should appear (including subject choice and layout). Evidence found that the use of novel photographs contributed to increased attention to the image, followed by longer memory retention of the image. This result contributed to the fact that people gaze for a longer amount of time at novel photographs than typical ones (Mendelson, 2001).

Wanta and Remy (1995) support this in their research that memory is increased when the images hold interest to the participant (Wanta & Remy, 1995). Pezdek (1987) used participants from four different age groups and found that they were more easily able to recall pictorial information from photographs because it is encoded schematically, which is a similar process to how information that is represented in a sentence can summarize a picture. It was found that the

longer amount of time that a person spends studying a picture; the more likely they are to remember. This is because they spend more time picking up the details of a picture and storing it for memories. The main finding of this study suggests that when we "recall" details of a picture it is not because we are able to remember every detail but because of the way we process it schematically (Pezdek, 1987).

Graber (1987) supports the role of schematic processing and asserts that without the use of images on television, people have a more difficult time bringing up an image in their head when watching a news report about devastation in a different country. Graber uses Ethiopia as an example that the images portraying African famine conditions are what enacted a response from viewers in America. Television images about current events help people to more effectively visualize and store "mental schemata" (Graber, 1987, p. 76). In addition to storing the information for later retrieval, photographs have even been found to being a preferred teaching method over verbal discussion (Berry & Brosius, 1991). Learning styles on younger age groups was investigated by Britsch (2010). In a study on small immigrant children, it showed that they were able to learn messages from visual aids but in order for them to understand they had to change the characters and actions in ways that they could relate to the image on a deeper level (Farrell, Arizpe, & McAdam, 2010).

While these findings and continual studies on visual communication are exciting and appropriate for an increasingly visual world, they also have some researchers concerned as they observe this generation as becoming more adept to visual processes. Because of an increasingly saturated visual world, Griffin (2008) emphasizes that it is very important for young generations to be adequately proficient at understanding and communicating through media and that understanding the visual side of imagery in the media is a major component (Griffin, 2008).

Sontag (2002) writes that due to a generation of "information overload" visual images are the quickest and most proficient at compacting and storing information (p.113) "the problem is not that people remember the photographs but that they remember only the photographs" (Sontag, 2002, p. 115).

In support, Messaris (1998) suggests that humans' minds are built to quickly process images more efficiently and intuitively than non-visual communication mediums. While much research has begun to focus on how visual communication aids in cognitive processes, Mendelson and Thorson (2004) note that everyone's learning styles are different. Some people are "visualizers" while others are "verbalizers" and that visual imagery, such as photographs in a newspaper, may not achieve learning as quickly with verbalizers as it does with visualizers (Mendelson & Thorson, 2004).

Emotional effects of photographs

If effective learning isn't easy enough through the efficiency of a photograph, the media has an even more effective reason to communicate to the viewers. The effects of photographs on a viewer's perception about a specific issue or event have been investigated by many researchers (Barbosa, 2010; Gibson, 2000; Zillmann, Gibson, & Sargent, 1999; Arpan et al., 2006). Through studies, images have been found to have a considerable impact on viewers. Photographers and even newspaper editors have used this to their advantage in their product when trying to convince an audience of a specific perspective.

Researchers have studied the effects of framing, or the way that photographers and newspaper editors capture and edit the picture and have been able to change the original message that the photograph was conveying. Edwards (2012) has found that photograph discrepancies can

greatly contribute to viewer's perception as some participants in their study have been found to

read more into the story or attention may be directed to more information than what the author is

trying to communicate through the photograph. In addition, editors have purposefully created

biases in an attempt to "sway" American voters in their decision process by editing photos that

portray presidential candidates during political debates in a more positive or negative manner

(Edwards, 2012). In an investigation conducted, photographs of immigrants of Greece and Spain

revealed that participants felt a sense of hostility or "otherness" (p.45) towards the immigrants in

the photographs. The authors attributed these perceptions to an overall sense of distance and

inability to relate to people in the photographs (Batziou, 2011).

Figure 1. "Destitute pea picker in California. Mother of seven children. Age thirty-two. Nipomo, California." Feb. 1936. Photo by Dorothea Lange. Courtesy of Library of Congress, Prints and Photographs Division, FSA/OW1 Collection, LC-USF34-T01-009058-CDLC.

Photograph portrayal does not always have negative intentions. Dorothea Lange's

photograph, which was taken February 1936, had an immediate impact on viewers. Lange had

notified the editor of the San Francisco news that pea pickers in California were starving. The

effect of this published photograph resulted in immediate action as food was soon thereafter

brought to the starving workers and continued as a progressive movement which was initiated

and aimed at improving conditions of the desolate pea pickers in the area (Gordon, 2006).

Cultural writer Kay Davis from *Survey Graphics* writes as follows: "Using documentary writing

and photography, the editors, writers and artists of *Survey Graphics* presented a portrait of

America that demonstrated their faith in social planning, their commitment to public education,

and their interest in the human variety that made up the nation" (Ross & Lester, 2011).

Lucaties and Hariman (2002) believe that the Dorothea Lange photograph instigated the

same emotional process that photographs which are considered "iconic" (p.38) will enact: once

the viewer sees the photograph, they experience fear which triggers an impulse to do something

about it. Lucaites and Hariman (2002) contend, "The problem of poverty will not be solved by

helping only the migrant mother, but any state action is unlikely to gain support if it cannot be

assented to by citizens habituated to see themselves as individuals first and last" (Lucaites &

Hariman, 2002, p. 38).

Researchers have focused on methods which expedite visual processing. Dual coding

theory suggests that there are two different systems, verbal and nonverbal, that respond

separately to input. The verbal system processes verbal input and output in the form of chunks

that are labeled *logogens*. This is the basis for processing words. The nonverbal system processes

nonverbal input labeled *imagens*. The main difference between these two processes is that

although the imagens are mainly visual, they may also be experienced through touch and sound.

The nonverbal system is comprised of affective responses such as fear or excitement. These

systems work independently or interactively.

Emotions elicited from images are related to the visual learning processes that provide connections between the verbal and nonverbal systems (when the sight of a cat elicits the name of the animal, or when the word *cat* elicits an image of a favorite pet) (Paivio, 1991). Sibbet (2008) supports this theory and sees visual learning as a process that comes from experiences that relate to an image. He claims that the input/output process of learning visually includes using visual images as the "artifacts" of the process (Sibbet, 2008, p. 120). Further work was investigated into this theory in an investigation on Chinese students who rated the same story which was formed to be relatable to the participants and was presented in the English and Chinese language. Results were supportive of the dual coding theory and found that the participants who conjectured their own imagery to accompany text of a familiar story had a more meaningful and enjoyable time reading the story (Steffensen et al., 1999).

It is possible for an individual to become overemotional or overstimulated by a photograph. Sensationalism, which is defined as "stimulus that is capable of provoking attention or emotional responses in viewers" (Grabe, Zhou, & Barnett, 2001, p.550), can increase the viewer's likability of the story. It is noted, however, that there is a leveling point that if sensationalism is perceived too strongly from the viewer, they are just as likely to be turned off by the overly-sensational stimuli (Vettehen, Nujiten, & Peeters, 2008).

Figure 2
(photograph taken from http://www.telegraph.co.uk)

In a photograph entitled, "Accidental Napalm" (figure 2) the Hariman and Lucaites attempt to analyze the moral capacity that the photograph may have on a viewer. They explain that the obvious components in the photograph such as the children running, the naked child in apparent pain and shock, and the soldiers carrying guns behind them with a blackened sky in the distance immediately communicate a moment of pain and trauma.

They suggest that there are more elements communicated in the photograph that tell a more complex story that raises questions to the mind of the viewer about the situation that is presented in the photograph in that moment in time, they note that the soldiers "casually" (p.39) walk behind the children, suggesting a certain detachment from the trauma and intense need of help that the children are demonstrating in the photograph. They believe that the photographs are relaying a type of text that can be defined as a "photographic discourse" (Hariman & Lucaites, 2003, p. 37). Additionally, Moller suggests that all iconic photographs of past wars are so significant to the present because they "help extend the past into the present and maintain the past's importance to the present" ((Moller, n.d., p. 102).

Photographic discourse

As photographs are the primary focus that photographers and visual ethnographers who set out into foreign countries and rural villages include in their fieldwork, text is an important accompaniment. Alesich (2007) suggests, photographs communicate information which cannot be conveyed in the written word; a photograph by itself cannot create a narrative (Alesich, 2007). Ross and Lester (2011) contend that while images add information to a narrative in a story, they can also serve as a structure for the text that may influence a specific part of the story that is being constructed (Ross & Lester, 2011).

An image can also be in the form of an iconic symbol of an event or issue such as an image of the New York Trade Towers, just before they collapsed. This image can represent a narrative that has been constructed collectively or as individual memories. Although the image itself may not contain any text, it still serves as a cue which activates a narrative in the memory of the mind of the viewer. "While emotions need to be written out in words and be explained, they can be written on the faces and bodies of humans in photographs" (Ross and Lester, 2011, p.54). This difference is instantaneous and sometimes more powerful. They argue that images can take this one step further. Not only do images define or add to a narrative by referencing events but they also bring "experientiality" (p.39) to the viewer. Lester and Ross (2011) suggest that through the written language and through imagery, we create frames to how we see, interpret, and understand the world (Ross & Lester, 2011). As photojournalist Mark Hancock puts it, "A journalist tells stories. A photographer takes pictures of nouns (people, places and things). A photojournalist takes the best of both and locks it into the most powerful medium available- frozen images" (Griffin, 2008).

Narrative

The previous section has attempted to discuss narratives and uncover their communicative qualities in visual form. This section will first focus on the narrative in its simplest meaning, as a story- a "spoken or written account of connected events" (*Oxford English Dictionary*, 2010). Narratives are found in almost every medium of communication including novels, films, textbooks, news media; as well as verbal discourse including speeches of leaders, conversations of community groups, or telling of an individual life story. Not only are they consumed for enjoyment purposes (Bryant & Zillman, 2002) but they can also be identified by cultural and educational studies as a form of "raw data" (Hammack & Pilecki, 2012, p. 76).

Hammack and Pilecki (2012) suggest that narrative is defined at two levels. At the first level, narrative describes a *cognitive process of meaning-making* which is an individual process of sense-making. The second level is identified as story-making which occurs at a social level. A combined overview of these levels of narratives is provided by Hammack & Pilecki (2012) in a framework compiled of four principles. In the first principle, it is suggested that the nature of word meanings and storylines essentially affect the way people think about the world from a social and political view. The second principle is that humans develop the principal of *personal coherence*, which means that the mind seeks order in time and place, gives a sense of continuity and can be provided by story-making. The third principle suggests that humans gain a sense of solidarity through narrative. Not only do we seek continuity in our selves but we also seek it in a community of shared practice such as a culture, nation, or other type of social identity. This idea of a social identity is supported by much earlier work from Bormann (1972) who suggested that a social reality can be constructed by dramatic situations from which people adopt a specific attitude towards and is shared by others motivated by the same attitude. This social or symbolic

reality becomes what he calls a "rhetorical vision" (p.398). A rhetorical vision is made up of fantasy themes that become public and group interactions. Once this is created, it sparks a response form an "emotional chain" (p.400). Finally, the fourth principle embraces the notion of *mind in action* which suggests that humans do not passively engage in daily endeavors; instead, we actively participate in our social practices and our relationship to that practice is facilitated by narrative (Hammack & Pilecki, 2012).

In conclusion of defining a narrative, Walter Fisher, who was the first to propose that all humans are storytellers, created a paradigm under the belief that human decision making and communication are a practice of "good reason" (p.5) which is a derivative of human self, based on a person's history, biography, culture, and character. Rationality is determined by *narrative probability*- a person's coherent story which is constantly tested by *narrative fidelity*- the validity of the story constantly being tested by what "rings true" (p.5) with other stories that seem true to that person in their life (Fisher, 1987).

Fisher (1984) challenges the belief that human narration is purely argumentative or persuasive and that human narration is purely for the purpose of communicating facts. While his stance questions this belief, it does not invalidate the need for persuasive narrative; it simply suggests that there is more than one form of narrative. He explains, "By 'narration', I refer to a theory of symbolic actions—words and/or deeds- that have sequence and meaning for those who live, create, or interpret them. The narrative perspective, therefore, has relevance to real as well as fictive worlds, to stories of living and to stories of the imagination" (p. 2). He points out that his proposed "paradigm" (p. 2) is merely a design that structures the natural form of narrative— the human experience (Fisher, 1984).

Meaning through Narrative

"A whole life gets its sense from its success in embodying or present a coherent narrative" (Williams, 2007, p. 305). Fivush, et al. (2011) concede that from the time that children are infants and toddlers they are encouraged to participate in a sociocultural world. For example, they are exposed to words and numbers that are embossed on their blankets, toys, and books which exposes them to literacy through signs and symbols. Children are further encouraged to construct a sense of identity through narrative as their parents encourage them to explain their day and what they did through short narratives such as "I played at the park today" (Fivush, Habermas, Waters, & Zaman, 2011, p. 323).

While almost every person during childhood has consciously experienced a narrative whether in the form of a picture book or even through imaginary games, most people may not consider themselves as subconsciously living and enacting narratives through their adulthood. Conway (2004) points out that this expression of self through narratives continues into a person's adult years as they build relationships and find a sense of stability and identification which create coherence and consistency in their lives (Conway, Singer, & Tagini, 2004). As Fivush et al. (2011) puts it, "narratives provide the framework for understanding and evaluating human experience" (Fivush et al., 2011, p. 324).

According to McAdams (2001), a life story is manifested in two ways. First, short and small episodes are organized into a coherent life narrative. When a life narrative is created, global coherence is created by chronological structure and causal motivational and thematic connections made up of individual events and autobiographical reasoning that link events to each other over time (McAdams, 2001).

Hoeg (2009) supports the belief that every person's narrative began at an innate stage and progressed into the first five years of their life from which they arrived at a conscious awareness of both their self and the external socio-cultural world. The stories that humans create through their culture are not just products; instead, they are products of relationships between society and nature. He suggests that our entire social world is based on metaphoric as both of our intrasocial (relationships between individuals and their society) and extrasocial (relationships between society and its natural environment) are based on metaphors, stories, and other narratives that don't actually hold any literal truth but are instead packed with figurative realities (Hoeg, 2009).

As studies advance in the field of narratives, it may also provide meaning for memory through narratives. In a study found by Grysman and Hudson (2011) participants were analyzed on their construction of narratives through personally experienced events. They found that autobiographical memory, which they renamed as "episodic memory" is an elaborated memory mechanism that is in line with the person's conception of self. Events were remembered as they occurred and then added upon with a personalized meaning. It was found that the same approach when extracting a narrative from a scene was also used when recalling an episode from a long-term memory (Grysman & Hudson, 2011).

When a person is accused of being "narrow-minded", perhaps there is more proof behind it. McAdams (2006) suggests that narrative coherence also refers to the structure of a story and needs to stay within the confines and constructs that the reader holds about their sense of the social world. It also needs to be able to analyzed morally and keep within the explicit and implicit norms of a society and keep a structured explanation of how a person came to be

successfully integrating a "life in time" (p.117) will create a coherent and understandable

narrative for the audience (McAdams, 2006).

Persuasive/Applied Narratives

Green and Brock (2000) assert that, "the power of narratives to change beliefs has never

been doubted and has always been feared" (Green & Brock, 2000, p. 701). In their work, they

posited that transportation is the key element of narrative impact. This notion was tested on

participant's emotional reaction, mental imagery, and loss of access to real-world information in

rhetorical readings. Results showed that participants were *not* affected by fact versus fiction

labeling when being transported in the narrative. This brought up an area of concern to the

researchers in terms of an individual's ability to be easily swayed by realistically presented

fiction which could bring them to the mercy of manipulative communicators.

Building on this finding, it was found that once participants became immersed in the

narrative, the credibility of the source diminished and had more persuasive impact than rhetorical

persuasion. They did have difficulty completing simple tasks instructed to them beforehand once

immersed in the narratives, which was not only consistent with the hypothesis that transportation

could affect instruction set on recall but it was also surmised by the researchers that individuals

who are in a boring or stressful state may long to be elsewhere and might be more motivated to

transport themselves into a narrative (Green & Brock, 2000). Their findings that transportation

through narratives can carry a person on an emotional journey and find them changed at the end

of their reading or trip has been further built.

According to a recent three part model, constructed by Edelsburg and Singal (2013)

change can take place in a narrative through a "Trojan" (p.60) horse analogy. It uses familiar

symbols, images, and language that is familiar to the audience member so that they become

engaged in a narrative that is familiar yet different. They feel that participation is of their free

agency and not forced upon them. Change can also take place by the audience member when

they feel emotionally involved with the narrative. This process is unlike spectating as the

audience member feels that they are in the shoes of the characters of the story, experiencing and

absorbing the event (Gesser-Edelsburg & Singhal, 2013).

     Further research supports attitude change through transportation of a narrative. Two types

of readers who were categorized as either *Need for Affect* or *Need for Cognition* were both tested

on their transportability. Positive correlations were found for both types of participants as they

were both able to easily engage emotionally as well as cognitively through the narratives. The

Need for Cognition participants were not only able to process the information thoroughly,

they also reported transportability through the narrative (Thompson & Haddock, 2012).

Rationale and Research Questions

National Geographic possesses a unique approach to communicating current events involving political affairs, environmental issues, and human interest by combining narratives and corresponding images. Their direction has been evolving over the past 125 years and continues to educate, inspire, and move readers with their simple yet complex messages and images.

According to Lutz and Collins (1993), *National Geographic* utilizes a very involved and in-depth process with the photographs before they hit the newsstands. During the photo selection process, a single article typically takes two full weeks of selection of content (in a typical selection process, 80-100 photos are whittled down to about 25), selection of size, order, and placement of the photographs. Layout specialists emphasize that their work is content-driven which means that the information in the photographs is more important than the aesthetic qualities when deciding on sequence of photographs. This process, at times, can create conflict when the photographer wishes to see his favorite photographs in the magazine while the editor is driven by seeing coherently-developed themes in the stories. The captioning process is separate from the photograph and writing team but is equally important. Marketing studies show that 53% (p.82) of subscribers read only the picture captions (Lutz & Collins, 1993). Legend writers, those who write the captions, go to extensive measures to ensure that their facts are correct. Their work is quality-based as they are expected to produce lively, literate, and concise work that links the pictures to the world in a way that resolves most ambiguity (Lutz & Collins, 1993).

The amount of energy, consideration, and purpose that is invested in *National Geographic* magazines is unparalleled to most popular magazine publications. Their work is not merely focused on increasing their profit margin (www.nationalgeographic.com/about/); instead, their purpose is education on human-interest topics in numerous forms and distributed to people

of all backgrounds. Because of this, it is appropriate that more research is undertaken to understand more about their magazines and how they connect readers to the world through a pair of high-quality lens and ink on paper.

This research involved a content analysis of the *National Geographic* magazines and searched for themes and connections between the narratives in the text and the images that accompany. The study attempted to find a relation between the messages that are being conveyed and the photographs that accompany the story. This study investigated *National Geographic* magazines by analyzing all of the featured stories in a two-year period beginning January 2010 and ending December 2011. This analysis attempted to answer the following questions:

RQ1: Do the photographs or the text dominate the majority of the content in each story?

RQ2: What visual and textual themes are present in the *National Geographic* stories: Geographical, Environmental, Human Systems, Animal Systems, and Human Interest/Discovery (education.nationalgeographic.com/education/national-geography-standards/?ar_a=1).

RQ3: Is there a relationship between the themes in the photographs and themes in the text?

METHODS

Grounded Theory

Prior to answering the research questions in the *National Geographic* magazines, a grounded theory analysis was utilized to develop categories of photograph content and story content which can be coded for a content analysis. Strauss and Corbin (1990), who note that this theory was first introduced in 1967 (p. 5), define the procedures of grounded theory as "designed to develop a well-integrated set of concepts that provide a thorough theoretical explanation of social phenomena under study" (p. 5).

It is recommended by Strauss and Corbin that a specific process be followed during data collection and analysis. They stress that analysis starts at the first part of data collection. When data is collected, simply "raw data" (p. 7) cannot be used. Instead, "incidents, events, and happenings are taken as, or analyzed as, potential indicators of phenomena, which are thereby given conceptual labels" (p. 7). A crucial part of the analysis process is coding the data. There are three types of coding: open, axial, and selective. In open coding, the data is fractured "fracturing the data forces preconceived notions and ideas to be examined against the data themselves" (p. 13). During this process, events, actions, and interactions are compared with others for similarities and differences. In axial coding, categories are associated to their subcategories and the relationships tested against the data. In selective coding, all categories are fused around a main category and if other categories need further clarification they are filled in with descriptive detail. For this study, open coding was used to build a descriptive, preliminary framework for analysis.

Content Analysis

After the grounded theory was complete, a content analysis was conducted as a research method to draw questions about data found in the text. A content analysis is a method of observation from which data is extracted from the text using a research technique that is "objective, systematic, and quantitative" (Riffe, Lacy, & Fico, 2005, p. 24). According to Riffe, Lacy and Fico (2005), "the emphasis on data reminds the reader that quantitative content analysis is reductionist, with sampling and operational or measurement procedures that reduce communication phenomena to manageable data (e.g., numbers) from which inferences may be drawn about the phenomena themselves" (Riffe et al., 2005, p. 24). For this study, the data was the proportion of text and photograph ratio in the stories and the frequency of textual and visual themes. The proportion of text and photograph ratio was based on a method that calculated the total square inches of each page of the story. Since each page in the magazine is 70 square inches, the coders were trained to analyze text versus photograph on each page so that the total page equaled 70 square inches.

Narratives Used in the Analysis

The narratives used in the analysis were selected on specific criteria. The *National Geographic* Magazines index page, typically within four to six pages into the magazines, states the magazine name, month and date issued, and volume/number. Each magazine generally holds five featured stories which are also announced on the front cover. All of the stories from each magazine beginning January 2010 and ending December 2011 were used in this content analysis.

Themes identified in the Analysis

The themes used in this analysis were modified from an educational list found on *National Geographic*'s website (education.nationalgeographic.com/education/national-geography-standards/?ar_a=1). The five themes are titled: geographical, environmental, human systems, animal systems, and human interest/discovery. For the purpose of this study, the themes from the website were modified. The text portion of each story was analyzed for one theme from the list of themes provided below. To qualify as a theme, the text portion only needed to meet one of the listed criteria under each theme.

I.   Geographical-

    i.   The text portion was analyzed for reference to space between geography including location, distance, direction, scale, movement, region, or volume.

    ii.   The text portion was analyzed for reference to geographical depictions including maps, or geographic representations (i.e. globes, graphs, diagrams, aerial and satellite images).

    iii.   The text portion was analyzed for reference to titles or unofficial names of places.

    iv.   The text portion was analyzed for reference to describe geographical areas including continents, islands, countries, regions, states, cities, neighborhoods, villages, and uninhabited areas.

II.   Environmental

    i.   The text portion was analyzed for reference to the components of the earth's physical systems, including: sky, plants, soil, oceans, lakes, and mountains.

    ii.   The text portion was analyzed for reference to the relationship between the earth and sun, including: oceans, rivers, lakes, water vapor, ground water, and precipitation.

    iii.   The text portion was analyzed for reference to earth's physical process, including: volcano, earthquake, hurricane, forest fire, tornado, or natural disaster.

III.   Human Systems

    i.   The text portion was analyzed for reference to fertility, mortality, birth and death rates, age, or sex.

    ii.   The text portion was analyzed for reference to culture in forms of language, race/ethnicity, religious practices, dress, foods, or traditions.

    iii.   The text portion was analyzed for reference to human contribution or development in any form including: new technologies/inventions, institutions, education, art, or architecture.

    iv.   The text portion was analyzed for reference to human expansion including economy, government, capital, assets, or labor.

    v.   The text portion was analyzed for reference to conflict or cooperation between humans including world wars, regional wars, civil wars, terrorist attacks, urban riots or treaties/compromise.

IV.   Animal Systems

    i.   The text portion was analyzed for reference to animals and insects on land, in the air, and in the ocean.

V.   Human Interest/Discovery

i.   The text portion was analyzed for reference to areas, inventions, or contributions to space exploration.

ii.   The text portion was analyzed for reference to exploration of foreign areas that are on land or in water.

iii. The text portion was analyzed for reference to historical findings/discoveries.

iv.   The text portion was analyzed for reference to human discoveries or inventions.

Conversely, the photographs were also analyzed on the same five themes (geographical, environmental, human systems, animal systems, and human interest/discovery) as this content analysis compared the identified themes in the text to the identified themes in the photographs. The photograph portion of each story was analyzed for one theme from the list of themes provided below. To qualify as a theme, the photograph portion only needed to meet one of the listed criteria under each theme. The photographs were analyzed for the following themes:

I.   Geographical

i.   The photograph portion was analyzed for images which indicate space between geography including location, distance, direction, scale, movement, region, or volume.

ii.   The photograph portion was analyzed for images which indicate geographical depictions including maps, or geographic representations (i.e. globes, graphs, diagrams, aerial and satellite images).

iii. For places and regions, the captions, which are generally printed on the photographs, was analyzed for the photograph portion for titles or unofficial names of places.

iv.   The photographs were analyzed for images of continents, islands, countries, regions, states, cities, neighborhoods, villages, and uninhabited areas.

II.   Environmental

i.   The photograph portion was analyzed for images which indicate the components of the earth's physical systems, including the sky, plants, soil, oceans, lakes, and mountains.

ii.   The photograph portion was analyzed for images which indicate the relationship between the earth and sun, including: oceans, rivers, lakes, water vapor, ground water, and precipitation.

iii.   The photographs portion was analyzed for images which indicate earth's physical process, including: volcano, earthquake, hurricane, forest fire, tornado, or natural disaster.

III.   Human Systems

i.   The photograph portion was analyzed for images of people of any race/ethnicity, age, or gender. Additionally, this analysis also analyzed the captions printed on the photographs which may have stated any numerical value which describes fertility, mortality, birth and death rates, age, or sex.

ii.   The photograph portion was analyzed for people in the images who are demonstrating culture through dress, foods, acting out traditions/religious practices of any race/ethnicity, age, or gender.

iii.   The photograph portion was analyzed for images which indicate human contribution or development in any form including: new technologies/inventions, institutions, education, art, or architecture.

iv.   The photograph portion was analyzed for images which indicate human expansion including economy, government, capital, assets, or labor.

v.   The photograph portion was analyzed for images which indicate conflict or cooperation between humans including world wars, regional wars, civil wars, terrorist attacks, urban riots or treaties/compromise.

IV.   Animal Systems

i.   The photograph portion was analyzed for images that indicate animals and insects on land, in the air, and in the ocean.

V.   Human Interest/Discovery

i.   The photograph portion was analyzed for images that indicate discovery to areas, inventions, or contributions to space exploration.

ii.   The photograph portion was analyzed for images that indicate exploration of foreign areas that are on land or in water.

iii.   The photograph portion was analyzed for images that indicate historical findings/discoveries.

iv.   The photograph portion was analyzed for images that indicate human discoveries or inventions.

Since the full narrative in each story is composed of the text and the photographs, this analysis searched each component for the same themes, but it used different methods to identify each. The photographs were identified through a more abstract approach because they are not as clearly defined in their presence as the text was. Two coders were trained to search for activity or relationships between the subjects in the photographs that may have indicated the type of theme.

Relationship between Photographs and Text

   To test for a relationship between the photograph portion and the text portion in each story, the *chi* square test was used. In order for the coders to produce valid results in the content analysis, a code book was provided during the coding stage. The two coders were trained to analyze the textual portion of each story. This process may have been more exhaustive for the coders yet it ensured that the full message or story of the textual portion was analyzed. After they had read the textual portion, they chose a theme that most appropriately described the paragraphs and marked it in their coding sheets. After they had analyzed and identified the theme from the text portion and the photograph portion and marked it onto their coding sheets, the data was then entered into *SPSS* statistics program to test for association between the two variables.

Analyzing Captions

   Lutz and Collins (1993) noted that the process involved at *National Geographic* when creating the captions, is separate from the photographic and text process when compiling the stories in the magazines. They also noted that the Legend Writers, those who create the captions, take very measured steps to ensure that the information that they provide is valid. They periodically consult with the photographers so that their stories are in-line with the photographer's experience (Lutz & Collins, 1993). For the purpose of this study, the caption was included in the photographic analysis during measurement of frequency and identification of themes. The reason for this was that the captions supplemented and defined what was taking place in the photographs. Because they were so closely associated, it was more appropriate that they were included in the analysis.

Relationships between Photographs and Text

Although a *chi* square test was conducted between the photographs and text in each story, a correlation between themes did not necessarily indicate a relationship. Therefore, each of the two coders was trained to identify only *one* artifact that suggested a relationship between the photographs and text. The six types of relationship that the coders were trained to identify and code were: no connection, map, location/landmark, named figure, named species, named object, and conceptual. 'No connection' meant that there was no connection found between the photographs and text. Charts, graphs fell into the 'map' category. The coders were trained to analyze for a person who was mentioned in text and shown in the photograph along with a direct reference to that person in the accompanying caption. The coders were trained to analyze for a species of plant or animal that was mentioned in the text and shown in the photograph along with a direct reference to that person in the accompanying caption. The coders were trained to analyze for mention of any type of object that was mentioned in the text and was shown in a photograph along with a direct reference to that object in the accompanying caption. The coders were trained to analyze for a concept of some thought or action between the text and photographs which was referenced by the caption.

Analyzing Maps, Charts, and Graphs

Similar to the method used in analyzing captions; maps charts, and graphs were also included in the photographic portion analysis. Although these modes of communication did not typically have geography or people in their content, they still were visually communicating information to the reader. Therefore, they were included in the measurement of photographic

frequencies and in the identification process of photographic themes. In an effort to simplify this

process, maps, charts, and graphs were referred to as "maps".

RESULTS AND DISCUSSION

Results of Grounded Theory Analysis

The five themes that were used for this study are from a list that was used as an

educational tool for students from the *National Geographic* website

(http://education.nationalgeographic.com/education/standards/national-geography-

standards/?ar_a=1). The themes in the list were modified for the purpose of this research. During

the analysis, the coders were instructed to quantitatively analyze the percentages of text and

photographs in each story using specific methods and procedures. After they had completed the

quantitative portion they were then instructed to read the textual portion of each story in the

magazine and decide which theme was the most appropriate fit for the textual narrative. Finally,

they were instructed to view the photographs from each story and read the accompanying

captions and decide which theme was the most appropriate fit for the photographic narrative.

In order to streamline the process and to reduce bias from the residual information from

the textual story, the coders were instructed to focus on one process at a time. For example, after

using the specific methods provided to measure and calculate the percentage of text and

photographs from all twenty-four magazines, the coders were asked to identify the textual

themes from all twelve magazines. They were then instructed to identify the photographic

themes from all twelve magazines (twelve magazines per coder, twenty-four magazines analyzed

total).

Reliability between coders is critical to achieving accurate results in a content analysis. A

coder reliability test was assessed and conducted using Cohen's *kappa* formula (Riffe, Lacy, &

Fico, 2005, p. 151). According to Riffe, Lacy, and Fico (2005), acceptable reliability occurs

when the test indicates .80 or higher (Riffe et al., 2005). Reliability for this analysis was

calculated at .90, and was considered acceptable for this study.

The list of themes originally found on the *National Geographic* website included; The

World in Spatial Terms, Places and Regions, Physical Systems, Human Systems, and

Environment and Society. While these themes are used for educational purposes, they also serve

as a general compass of organized areas that are covered in the magazines. For the purpose of

this study, the themes were modified to be more applicable and allow for more tangible evidence

for the coders to identify during the analysis process. While the modified themes were intended

to be more straight-forward for the coding process, there was still unavoidable vagueness in

determining themes, such as identifying action in photographs as a designated theme. However,

the coders were trained to rely equally on the captions for support in obtaining information to

identify the theme.

The modified themes which the coders used in the analysis process were: geographical,

environmental, human systems, animal systems, and human interest/discovery. The coders were

trained to identify one of these themes for the textual portion and the photographic portion of

each story. Due to the fact that the research questions examined each portion (textual and

photographic) of the individual stories in the magazines it was anticipated that a different theme

of each portion may be extracted from each story. During the analysis process, however, *more

than one theme* from each portion (textual and photographic) began to surface. While the coders

were initially instructed to identify only one theme from each portion, it became difficult to

decipher only *one* theme from each portion as some of the stories were dependent on more than

one theme. For example, in the May 2011 magazine, a story about Bangladesh was cited as

containing the same theme for both the text and the photographs. The coder had difficulty in

identifying only one theme. The story, which was unanimously supported in both the

photographs and the text, had three prevailing themes that served as the structure of the story.

The textual portion of the story discussed how a country of 164 million people lives in an area

smaller than the size of Utah. The country is located on a delta of three major river systems. As a

result, Bangladesh is chronically flooded which causes current problems and could permanently

uproot millions of coastal residents in the future. The story also focused on how the people adapt

to their environmental situation (over-flooding of crops) by finding alternative methods of

cropping such as floating gardens. This story was coded as having three-dimensions-

environmental, geographical, and human systems because all three themes are related and

interconnected in this story (example in figure 3).

Figure 3
(Courtesy of nationalgeographic.com)

 As a result of this finding, three different categories were created in addition to the five themes

discusses above.

        Coding procedures were modified to adapt to stories such as the one above and three

categories emerged from the analysis. The stories were analyzed for one dominant theme in each

portion but also up to two prevailing themes in each portion. Therefore, the textual and

photographic portion of each story could be analyzed for one-dimensional, two-dimensional, and three-dimensional qualities in each portion that included up to three of the themes being identified.

The identified dominant and prevalent themes were organized into their respective categories and the textual and photographic portions of the stories were analyzed for relationships. It was deduced early on in the analysis that finding a correlation between photographs and text in each story is important, but will not necessarily demonstrate a correlation. For example, if a story was analyzed and coded as having the same prevailing theme, such as geographical, it did not necessarily imply that they were related. Therefore, in order to find a clearer understanding of the relationship between the textual portion and photographic portion, the stories were also analyzed for one specific piece of artifact that suggested a relationship. Five specific types of relationship were included in the analysis; map, location/landmark, named figure, named species, named object, conceptual. In addition to these five, textual and photographic portion were also examined for lack of evidence of connection.

Results of the Content Analysis

For the next phase of the research, a content analysis was conducted to measure the frequency of the percentage of text per story, percentage of photographs per story, type and frequency of photographic and textual themes in each story, and the frequency of stories that had a direct relationship between the photographs and text.

Pertaining to the first research question and supported on the pie chart below, the analysis found that the photographs definitely dominate the stories. The photographs averaged 81.93% of the stories while the text averaged 18.06%.

Pie Chart

Average Percentage of Textual and Photographic Themes

18.06

81.93

■ Textual

■ Photographic
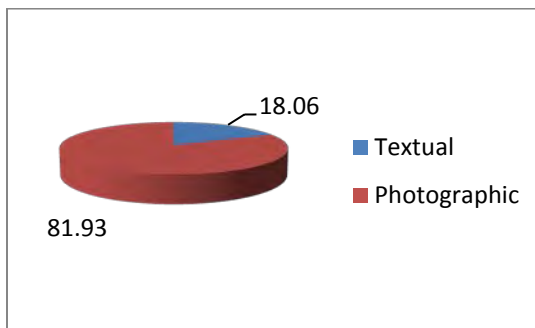
Demonstrated on pie chart 2, of the 119 stories analyzed, 'geographical' was identified in 15 of 119 textual portions of the stories, or 12.6%. 'Environmental' was identified in 17 of the textual portions of the stories, or 14.3%. 'Human interest/discovery' was identified in 24 of the textual portions of the stories, or 20.2%. 'Animal systems' was identified in 27 of the textual portions of the stories, or 22.7% and 'human systems' was identified in 36 of the textual portions of the stories, or 30.3%.

Pie chart 2

Frequency Distribution of Textual Themes in Stories

12.6
30.3
14.2
■ Geographical
22.7
20.2
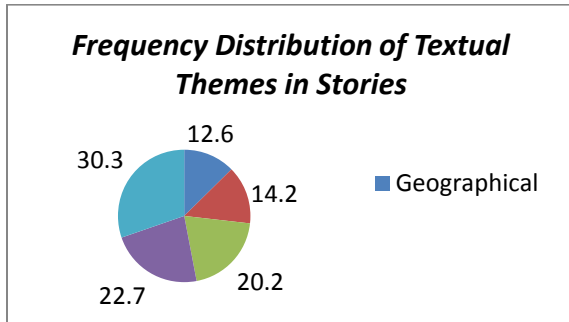
The stories were also coded as 'one-dimensional', 'two-dimensional' and 'three-dimensional'. Out of the 'geographic' stories, table 1 indicates that one out of the eleven stories, or 9%, was coded as 'one-dimensional', the rest of the stories had two more themes that interacted within each story.

Table 1

Dimensions of Geographical Themes

Score(X)		f	%
Valid	Two-Dimensional	6	54.5
	Three-Dimensional	4	36.4
	One-Dimensional	1	9.1

Out of the 'environmental' stories, table 2 indicates that three out of the ten stories, or 30%, was coded as 'one-dimensional', the remaining stories had two more themes that interacted within each story.

Table 2

Dimensions of Environmental Themes

Score (X)		f	%
Valid	Three-Dimensional	5	50.0
	One-Dimensional	3	30.0
	Two-Dimensional	2	20.0

Out of the 'human systems' stories, table 3 indicates that six out of the 23 stories, or 26%, was coded as 'one-dimensional', the rest of the stories had two more themes that interacted within each story.

Table 3

Dimensions of Human Systems Themes

Score (X)		f	%
Valid	Two-Dimensional	11	47.8
	One-Dimensional	6	26.1
	Three-Dimensional	6	26.1

Out of the 'animal systems' stories, table 4 indicates that 11 out of the 23 stories, or 48%, was coded as 'one-dimensional', the rest of the stories had two more themes that interacted within each story.

Table 4

Dimensions of Animal Systems Themes

Score (X)		f	%
Valid	One-Dimensional	11	47.8
	Two-Dimensional	9	39.1
	Three-Dimensional	3	13.0

Out of the 'human interest/discovery' stories, table 5 indicates that 12 out of the 18 stories, or 67%, was coded as 'one-dimensional', the rest of the stories had two more themes that interacted within each story.

Table 5

Dimensions of Human Interest/Discovery

Textual and Photographic Themes

Score (X)		f	%
Valid	One-Dimensional	12	66.7
	Two-Dimensional	3	16.7
	Three-Dimensional	3	16.7
		N=18	100.0

Out of the 'inconsistent theme' stories, table 6 indicates that five out of the 34 stories, or 15%, was coded as 'one-dimensional', the rest of the stories had two more themes that interacted within each story.

Table 6

Dimensions of Inconsistent Themes

Score (X)		f	%
Valid	Two-Dimensional	19	55.9
	Three-Dimensional	10	29.4
	One-Dimensional	5	14.7
		N=34	100.0

Of the 119 stories analyzed for the photographic portion, table 7 indicates that 'geographical' was found in 26 stories, or 21.0%. 'Environmental' was found in 15 of the photographic portions of the stories, or 12.6%. 'Human systems' was found in 31 of the photographic portions of the stories, or 26.1%. 'Animal systems' was found in 27 of the photographic portions of the stories, or 22.7%. Finally, 'human interest/discovery' was found in 20 of the photographic portions of the stories, or 16.8%.

Table 7

Frequency Distribution of Photographic Themes in Stories

Score (X)		f	%
Valid	Human Systems	31	26.1
	Animal Systems	27	22.7
	Geographical	26	21.8
	Human Interest/Discovery	20	16.8
	Environmental	15	12.6
		N=119	100.0

To test for correlation between the five themes of the photographic and textual portions,

table 8 reflects the results of a *chi* square statistical test was also performed on the results of the

frequencies ($x^2 = 227.25$ [df = 20], p > .000).

Table 8

Chi-Square Test of Correlation between Textual and Photographic
Themes

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	227.255[a]	20	.000
Likelihood Ratio	191.563	20	.000
Linear-by-Linear Association	49.021	1	.000
N of Valid Cases	119		

a. 20 cells (66.7%) have expected count less than 5. The minimum
expected count is .13.

The correlation between the photographic themes and textual themes *is* significant.

However, in order to find a *direct relationship* between the two, the coders, during the coding

process, were instructed to find *any* artifact between the photographic portion and textual portion

of each story that was in support of the other. According to table 9, only 11 of 119 themes had *no*

direct relationship, or 9% of the stories analyzed.

Table 9

Frequency Distribution of Styles of Direct Relationships in Stories

Score (X)		*f*	%
Valid	Named Figure	27	22.7
	Map	25	25
	Named Species	20	16.8
	Named Location/Landmark	15	12.6
	Conceptual	13	10.9
	No Connection	11	9.2
	Named Object	8	6.7
		N=119	100.0

After the stories were analyzed according to their frequency in the photographic and textual portion, they were divided and categorized according to stories in which the photographic and textual portions were the same. There were 34 stories that did not contain the same theme for both the photographic and textual portion of each story. They were grouped in their own category and named, "inconsistent themes". Each theme was then tested for frequencies. 'Geographical' was identified in 11 of the 85 consistently-themed stories, or 12%. 'Environmental' was identified in 10 of the 85 stories, or 12%. 'Human systems' was identified in 23 of the 85 stories, or 27%. 'Animal systems' was identified in 23 of the 85 stories, or 27%. 'Human interest/discovery' was identified in 18 of the 23 stories, or 21%.

Table 10

Inconsistent Themes

	Frequency	Percent
Geographical	11	12
Environmental	10	12
Human Systems	23	27
Animal Systems	23	27
Human Interest/Discovery	18	21
Total	119	100.0

Finally, the remaining group of stories, titled "inconsistent themes" was in 34 of the 119 stories total, or 29%. Twenty nine percent of the stories analyzed in the *National Geographic* magazines did not have correlating themes.

The stories which were divided and organized into their themes were also analyzed for 'direct relationship' between the photographic and textual portion and are displayed on bar chart 1. For 'geographical', 10 out of the 11 stories, or 90%, had a direct relationship between the photographs and the text. For 'environmental', nine out of the 10 stories, or 90%, had a direct relationship between the photographs and the text. For 'human systems', 21 out of the 23 stories, or 91%, had a direct relationship between the photographs and the text. For 'animal systems', 17 out of the 23 stories, or 74%, had a direct relationship between the photographs and the text. For 'human interest/discovery', 16 out of the 18 stories, or 89% had a direct relationship between the photographs and the text. For 'inconsistent themes', 32 out of the 34 stories, or 94%, had a direct relationship between the photographs and the text.

Bar Chart 1

Direct Relationships between Inconsistent Themes
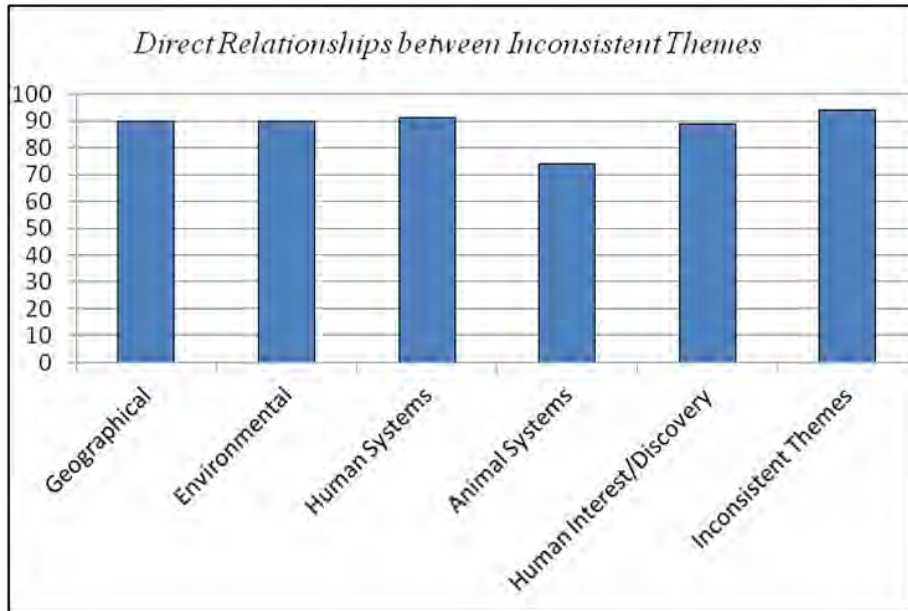
DISCUSSION

After the quantitative analysis of the results was calculated, a qualitative analysis of the stories was also analyzed. In each theme, the coders noted specific stories as examples of the five themes. Below is a list of those noted themes and a discussion on their characteristics that motivated the coders to identify their types of direct relationships and dimensions in each story.

Geographical

There were eleven stories that emerged from the theme identification portion of the analysis for geographical. The titles for those stories are as follows; *Sublime Scottish Islander: Edge of the World*, *Patagonia*, *Climb of Her Life*, *Greenland*, *Pakistan*, *Kaziranga*, *Protecting Marine Life*, *American West*, *3 Degrees of Japan Seas*, *Under Paris*, and *Adirondacks*. This theme had the second least amount of stories compared to the other four themes analyzed. The percent of photographic coverage in all geographic-themed stories averaged 13% of the 85 total stories (that were coded as stories that contained the same textual and photographic theme). Of the six types of direct relationship between photograph and text, the geographical theme's 'location/landmark' came in at 45%, and is the highest average 'location/landmark' relationship between photographs and text compared to the 'location/landmark' relationship of the six direct types relationship (no connection, map, location/landmark, named figure, named species, and conceptual). This theme also had only one story out of the eleven stories that was one-dimensional; six of the eleven stories were two-dimensional and four of the eleven stories were three-dimensional. Finally, of the eleven stories in this theme, only one had no relationship between photographs and text.

Relationships between Photographs and Text

In the October 2010 issue, one of the stories covered a topic about the West in America, titled *American West* and covered several brief stories of people living in the West. The number of the pages in the story covered 10 pages, with nine of them devoted to caption/photograph narrative. The one page that carried a textual narrative had a direct connection to the following page which briefly covered a young man named T.J. who is 17 years old in the photograph, (noted in the photograph and in the text). The caption describes what the boy is doing when the photograph was taken (eating "two slabs of camp-made bread slathered with peanut butter and pancake syrup") and why he is there ("his dad sent him to the IL Ranch in Nevada to be a Buckaroo"). The photograph also shows the determined, boyish yet rugged look on the boy's face, balancing his bread on both hands, posing for the picture, while the flat, desolate view of the West is out of focus behind him. The text goes into more informational detail about the boy that he is from a Hutterite religious community in Stanford, Montana. The text continues into a dialogue between the boy and the author:

> "You know-do you ever feel like leaving the colony?"

> "No", the boy said. "It must be a pretty rough life on the outside, all alone, trying to make a living. Don't you think?"

> "Yes," I told him. "It can be all of that."

The textual portion of this story suggests that the boy is apprehensive about the idea of leaving his community which is information that could not be gleaned from the photograph portion. The story of the encounter with the boy ends and the author discusses his other experiences in Montana. The other eight pages in the story are dedicated to other areas in the West and briefly cover other people's identities and lives. This story was coded as both the textual and the photographic portion being geographical because without the American West as

the subject, the coder felt that the story may have not been covered in that area or to those people.

Multi-Dimensional Themes

In the November 2010 issue titled, *3 Degrees of Japan's Seas* the dominant theme that is consistent in both the textual and photograph portion settles on the seas off of the coast of Japan. The textual portion focuses on the area of Japan ("stretches over 1500 miles and includes 5000 islands") it also mentions that there are "three distinct ecosystems… Including the frigid north, sea eagles, with their seven-foot wingspans, and king crabs frequent the ice-covered seas off the remote Shiretoko Peninsula." The photographic portion also focuses on the geographical components by featuring a one-page spread of a map of Japan, its surrounding islands, as well as cold and warm currents that flow into Japan and an explanation in the caption which cites on page 37, "Warm and cold ocean currents off of the coast of Japan, creating a wide range of temperatures. The result is a series of strikingly different marine communities, swept in by the currents." Finally, much of the photographs depict a wide variety of marine life found off of the coast. While the photographic and textual portion of this story each carry the same two themes (geographical and environmental), the last prevailing yet least dominant theme is supported largely by the photographs and is very minimally mentioned in the text, insomuch that the text was only coded with two themes while the photographs were coded with three themes; geographical, environmental, and human systems. Without the photographs the text would only convey two messages through its themes. Conversely, without the text, the reader would not know specific facts such as that the coastal temperatures that hug the shore of Japan range from 30 degree to 85 degree temperatures. The direct relationship between the textual and photographs

in this story is the map (photographic portion) which shows the location of the *Sea of Okhotsk* which is discussed in the textual portion of the story.

Environmental

There were ten stories that emerged from the theme identification portion of the analysis for 'environmental.' The titles for those stories are as follows; *Killer Plants: Fatal Attraction, A Mountain Transformed, Tribal Lands, Phoenix Islands Rising, Enter the Age of Man, The Volcano Next Door, Slot Canyons, World Without Ice, U.S. Rivers,* and *Japan's Nuclear Refugee.* This theme had the least amount of stories compared to the other four themes analyzed. The percent of photographic coverage in all environmental-themed stories averaged 20% of the 85 total stories that were coded as stories that contained the same textual and photographic theme. Of the six types of direct relationship between photograph and text, the geographical theme's 'location/landmark' came in at 30%, and is the highest average 'location/landmark' relationship between photographs and text compared to the 'location/landmark' relationship of the other four themes (geographical, human systems, animal systems, and human interest/discovery). In addition, five of the ten themes had all of the textual and photographic portions parallel in the story and they were all directly connected by one of the six types of direct relationship (no connection, map, location/landmark, named figure, named species, and conceptual). One story out of the eleven stories was one-dimensional, six of the eleven stories were two-dimensional, and four of the eleven stories were three-dimensional. Finally, of the ten stories in this theme, only one had no connection between photographs and text.

Multi-Dimensional Themes

In the March 2011 issue, *Killer Plants: Fatal Attraction*, there was no direct relationship between the textual portion and the photographic portion. The story was coded as 'two-

dimensional' and the two most prevalent stories did correlate. The text discussed geologists who

have researched the effects of pollution and how our environment has been affected, not only in

the past but the potential effects in the future. The photographs also discuss how we have

reached this point and potential problems that we could see in the future. The photographs named

specific destinations throughout the world that are affecting or have been affected by the human

species' effect on the environment. Pages 74 and 75 demonstrate a full two-page photograph of

industrial farming in the Almeria Province of Spain. The caption discusses that "greenhouses use

water and nutrients efficiently and produce all year- tomatoes in winter, for instance. Globally

the challenge is grain and meat, not tomatoes. It takes 38 percent of Earth's ice-free surface to

feed seven billion people today, and two billion more are expected by 2050." Another example is

on pages 80 and 81. There is another full two-page photograph of overgrown ivy that appears to

be choking out the trees and shrubs around it. The photograph is taken in Akron, Alabama and

the title is *Alien Invaders*. The caption on the photograph discusses an Asian Ivy, which was

planted in the 1930s to control erosion, is now posing a global threat to biodiversity and that

most of the species on the U.S. threatened and endangered lists are there in part because of

foreign invaders. These specific concerns, as well as other various environmental concerns

discussed in the photographs are not discussed in the text. Conversely, the textual portion in this

story discusses, as aforementioned, the human negative effects on the environment but it also

brings up specific points concerning, including a discussion on how global warming is affecting

coral reefs and preventing them from reconstructing themselves.

Human Systems

There were twenty-three stories that emerged from the theme identification portion of the

analysis for human systems. The titles for those stories are as follows; *The Polygamists,*

Changing Tribes, Shanghai Reborn, Troubled Spirits, The Secrets of Sleep, The Forgotten Road, Electrical Grid, Veiled Rebellion, Population 7 Billion, Opium Wars, Kung Fu Kingdom, Genius of the Inca, A Jewel in Two Crowns, Buoyant in Bangladesh: The Coming Storm, Yosemite: Daring, Defiant, Free, Bravura Camera Obscura, Child Brides, Baghdad, Middle Eastern Youth, Robots, Brazil, Teen Brains, and *Sami People*. This theme tied with frequency of stories alongside animal systems. Surprisingly, the highest frequency of direct connection between photographs and text was the "map", which was identified in 39% of the 23 magazines. The second most prevalent, however, was the "named figure", which was identified in 30% of the magazines analyzed for the human systems theme. The percent of photographic coverage in all human system-themed stories averaged 17% of the 85 total stories that were coded as stories that contained the same textual and photographic theme. In addition, five of the ten themes had all of the textual and photographic portions parallel in the story and they were all directly connected by one of the six types of direct relationships (no connection, map, location/landmark, named figure, named species, and conceptual). In addition, six stories out of the twenty-three stories were coded as 'one-dimensional', eleven of the twenty-three stories were coded as 'two-dimensional', and six of the twenty-three stories were coded as 'three-dimensional.' Finally, of the twenty-three stories in this theme, only two had no connection between photographs and text.

Relationships between Text and Photographs

In the February 2011 issue, titled, *Opium Wars*, 36% of this story was photographic. The photographs were most prevalent in their depictions of children, families, and single mothers being affected by Afghan policeman destroying their poppy fields (example in figure 3) which contribute to the raging opium addiction in Afghanistan. While the second most prevalent theme focused on geography, with wide, aerial shots of Afghanistan's terrain. The textual portion

followed the same two themes as the photographs. In the text, a named figure, Juma Gul, is discussed in two paragraphs about his addiction to opium. The text highlights the fact that while the Afghan government is trying to eradicate the addiction problem by focusing on farmers, families are still being affected. The direct relationship to that Juma Gul is found on page 60. A full, two-page photograph illustrates two men lying on their backs and smoking opium while two young children sit next to them. The caption reads, 'Opium addiction is epidemic in Sar Ab, a village in Badakshan. 'My whole family is addicted,' says Juma Gul (at right), smoking opium with a friend while his daughters sit nearby. 'But so are the mice, the snakes.' Opium is often used as medicine in remote areas with no health care."

Figure 4
(Courtesy of nationalgeographic.com)

In the September 2011 issue, the story titled *Brazil* carried the same theme in both the textual and photographic portion; however, there was no direct connection. Of the 26 pages in this story, 88% are photographs. The photographs show women of all age ranges and in all capacities; some are teens, some are raising children, many are working, and some are older women surrounded by their children and grandchildren. Most of the photographs are of women demonstrating independence as a full, two-page photograph shows four different shots of a young woman in different activities that are all part of her daily schedule. The caption reads:

Marcela Goncola Pessoa, 24, works as a maid for a wealthy woman whose extravagant Recife apartment looks like a set for one of the novelas she watches nightly (below, glued to Ti-ti-ti with her husband and sister). But Pessoa doesn't just wistfully admire the stylish lives of the characters; she's working hard to take charge of her own future. Each morning she dresses up for the hour-long bus commute (above) from her one-bedroom apartment in the city's low-income outskirts, where she shares a bathroom with several families (below). So far, Pessoa and her husband of four years have no kids. Will they? 'One, maybe two. To give them a proper education and a nice life, you can't have more,' she says. 'Right now, I want money to finish building our house and to buy nice things.'

The text narrates separate women's lives and whose names and faces are not in the photographs. Although the textual and photographic portion both narrate women's stories and are centered on the same theme: sexuality and fertility in Brazil, there is no direct connection between the two. In addition, a fact that is mentioned in the text, "new Brazilian fertility rate is below the level at which a population replaces itself," is nowhere to be found in the photographic portion.

A similar connection is found in the October 2011 issue titled, *Teen Brains*. The photographic portion relies heavily on photographs of students at parties and nightclubs; one teen who is demonstrating his leaping skill in the urban sport of parkour; teen's texting while driving teens getting body piercing; and young teens with babies. Most of the captions that accompany the photographs are narrating the teen's actions. There is one mention in a caption, on page 47, which reads:

Cars and parties, first cigarettes and first dates, school demands and free time-

teens encounter both risks large and small every day, and their choices can be

puzzling at times. Think of it as an equation, says psychologist Laurence

Steinberg, where consequences aren't given the weight they should be. And when

teens are around friends that throw off the equation even more.

The textual portion, on the other hand, focuses on facts that contribute to the research

surrounding why teens act the way they do. A key to dealing with teenagers is discussed on page

59 and reads:

Studies show that when parents engage and guide their teens with a light but

steady hand, staying connected but allowing independence, their kids generally do

much better in life. Adolescents want to learn primarily, but not entirely, from

their friends. At some level and at some times (and it's the parent's job to spot

when), the teen recognizes that the parent can offer certain kernels of wisdom-

knowledge valued not because it comes from parental authority but because it

comes from the parent's own struggles to learn how the world turns. The teen

rightly perceives that she must understand not just her parents' world but also the

one she is entering. Yet if allowed to, she can appreciate that her parents once

faced the same problems and may remember a few things worth knowing.

While both of these discussions from professional sources are discussed in the story, they are

both discussed through different modes of communication (text and photographs) and are not

connected in the story.

Multi-dimensional Stories

Veiled Rebellion in the December 2010 is a demonstration of two different themes, human systems and geographical, that is both prevalent in the same story, giving it two dimensions. The story is laid out on 26 pages, with 92% being photographs. The text, which is on two consecutive pages, discusses the suffrage of women in Afghanistan who are forced to marry and often experience little freedom or respect in their marriages. An example of this is discussed on page 37, "the 'little horror' is the man a woman is forced to marry, a kind of dupe. Only without his knowledge will she find true love. As Majrouh understood them, Pashtun women, for all their submissiveness, have always lived in a state of deep craving for rebellion and for the pleasures of earthly life." While the text briefly discusses the collective attitude of women towards men the photographs suggest that women are still capable. The succession of photographs in this story show young women who have become victims of the results of forced marriage. On the other hand, the photographs also depict women in various acts of rebellion, struggling to find freedom and an identity. The only direct relationship between the photographs and the text is a small map located on page 37 of Afghanistan. This story was coded as 'human systems' (dominant theme) and 'geographical' (second most prevalent theme) because the story focuses on women's suffrage which takes place in a country with known problems towards women's rights, as a result, the story is coded as having two adjoining themes.

In the November 2011 issue, three dimensions appear in the story. *Sami People*, who are described as "people who walk with reindeer", has a direct relationship between the photographs and the text. This, story, which is uncommon in most of the human interest-themed stories, has much of its focus on families who live on the Northern tip of Sweden. The 'named figures' are introduced in both the text and photographs. In addition, a map adds further support to the direct relationship as it gives readers a geographical image of the area that both the text and

photographs are referring to. The textual and photographic portion of this story also shares the same dominant theme- 'human systems.' The textual portion's second most prevalent theme is 'geographical', due to its emphasis on how the people live, adapt, and feel deeply connected to their land. From that point, the text discusses how they also respect and live off of their livelihood- the reindeer. While the photographs also are dominantly human systems-themed, they also heavily reveal, through the captions and photographs, the relationship between the people and their reindeer (example in figure 4). Apart from a photograph of a map of Sweden, the photographs only depict the Sami people's lives and the reindeer. Without the text, a reader may not realize that the geography of these people's lives is an important component to their uniqueness.

Figure 5
(Courtesy of nationalgeographic.com)

Animal Systems

There were twenty-three stories that emerged from the theme identification portion of the analysis for animal systems. The titles for those stories are as follows; *A Cry for the Tiger, Whale Sharks, Elephants, Langur Monkeys, Kermode Bear, Tide Pools, Sisterhood of Weaver Ants,*

Indomitable Snow Frogs, Foja Mountains, Whooping Cranes, Flamingoes, Ancient Swimmers, Crash, Swan Serenade, Eels, Insect Eggs, One Cubic Foot, Beautiful Friendships: Befriending Nemo, Gold Dusters, The Acid Sea, Bowerbirds, Politics is Killing the Big Cats, and *Taming the Wild*. The highest frequency of direct relationship between photographs and text was the 'named species', which was identified in 56% of the twenty-three magazines. Of the twenty-three magazines, six stories did *not* have a direct relationship between photographic and textual content. The percent of photographic coverage in all 'animal system'-themed stories averaged 17% of the 85 total stories that were coded as stories that contained the same textual and photographic theme. In addition, eleven out of the twenty-three stories were coded as 'one-dimensional', nine out of the twenty-three stories were coded as 'two-dimensional', and three of the twenty-three stories were coded as 'three-dimensional.'

Relationships between Photographs and Text

In the July 2010 issue, titled *Bowerbirds*, there was no direct relationship between the photographs and the text. Of the fourteen pages that are in this story, 86% are photographs. The photographs feature a species of male birds, named Bowerbirds who spend their time adorning their nests with brightly-colored organic material and garbage (figure 5). In another photograph, it illustrates a male bowerbird gracefully inviting a female to his nest. In the caption on that photograph, it states, "Flaunting an insect in his beak, a satin bowerbird makes noise, flaps his wings, and dances for the female sizing him up in the avenue of his bower. If the wooing works, he'll swoop to the rear and mate with her- a male's sole contribution to family." The photographs continue to depict intricate and extravagant nests that are "only used for courtship", as noted on page 81. The textual portion narrates the activities and efforts of a specific male Bowerbird affectionately named Donald, after Donald Trump, due to his ostentatious style in building his

courting ground. The captions in the photographs, however, do not specifically mention Donald

in the photographs and the reader is left wondering which courting ground belongs to the Donald

named and narrated in the text. While the photographic and textual portion are each 'one-

dimensional' and do carry the same theme, their relationship is not directly connected.

Figure 6
(Courtesy of nationalgeographic.com)

In the March 2011 issue, *Taming the Wild*, there is also no direct relationship between the

photographic and textual portion of the story. Out of the twenty-six pages, 70% is photographic.

The story is also 'two-dimensional' as its most dominant theme is 'animal systems' and its

second most prevailing theme is 'human interest/discovery.' The textual portion focuses on foxes

and, historically, they have been bred to be tamer towards humans. In addition, the text discusses

how in historic times, farmers would breed chickens to repopulate quicker. The photographs still

lead the same story about how animals have adapted towards humans through time. On page 50,

a photograph of feral cats who are both curiously peering at the camera is accompanied by a

caption that explains, "Feral cats roam the streets of Baltimore. Wildcats were the only animals

believed to have domesticated themselves, attracted at first by rodent prey found around early

agricultural settlements in the Middle East, beginning almost 10,000 years ago." This mention of

feral cats is not found in the text. The only slight connection in this story is found on a full, two-

page layout of two chickens, one of which is significantly taller than the other. The caption

reads, "Two chickens, both eight weeks old but vastly different in weight, show off size-based

breeding by geneticist Paul Siegel at Virginia Tech. 'We're using artificial selection as a tool to

look at natural selection. We just accelerate it.'" Although this information is closely related to

the information discussed in the text (chickens were bred by farmers to repopulate quicker), they

are still new and separate pieces of information and were not coded as having a direct

relationship.

Multi-Dimensional Stories

In the January 2010 issue, titled *Beautiful Friendships: Befriending Nemo*, the story was

coded for three themes. The story contained twelve pages and 83% were photographic. There

was a direct relationship between the photograph and text through a species of fish which was

stated on page 128. The photographs were coded as 'animal systems' being the most dominant,

'geographical' was coded for being second most prevalent, and the 'environmental' theme was

coded as being the third most prevalent. The photographs focused on the animal and its habitat

range, which is the only one to be found and sits off of the coast of Indonesia. On page 125, a

vivid photograph illustrates two clownfish leaving their dwelling which is actually inside of a

large anemone. The caption reads, "As dusk falls, a magnificent sea anemone contracts,

resembling a terra-cotta pot. Enough of its tentacles are exposed for the resident *percula*

clownfish, which can grow to about three inches long, to burrow into for safe haven. The color of

this anemone species' body varies from orange to pink, blue, green, red, or white." The textual

portion also discusses the clownfish and its unique habitat; however, it also introduces a new fact

that was not mentioned in the photographs and captions. On page 124, the text explains:

When Andrew Stanton set out to make an animated children's movie set in the

ocean and faithful to 'the real rules of nature', all he needed was the perfect fish

for his main character. Combing through coffee table books on sea life, his eye

landed on a photo of two fish peeking out of an anemone. 'It was so arresting,'

Stanton says, 'I had no idea what kind of fish they were, but I couldn't take my

eyes off them…' So a star was born. *Finding Nemo*, the Pixar movie… introduced

millions of children around the world to a wondrous tropical ecosystem: the coral

reef and its denizens.

Figure 7
(Courtesy of nationalgeographic.com)

In the March 2011 issue, three different themes were also identified in the story titled

Gold Dusters. There were eighteen pages in the story, 86% of which were photographic

coverage. There was a direct relationship between the two most dominant themes. This

connection was unique compared to any other relationship found in any of the stories analyzed.

On page 124, the text discusses a viral and fungal pathogen which is affecting the honeybee

population and states, "see box, left." On the referenced location is a photograph of bees with red

dots on their backs and the captions echoes the same information provided in the text. The

photographic portion illustrates how different animals and insects collect and distribute pollen

(example in figure 6) and one photograph (page 123) touches on how this process affects our environment. However, the textual portion discusses exactly how our honey bees affect not just the environment, but also people. On page 120, the text explains, "The European honeybee, first imported to the Colonies some 400 years ago, has been the domesticated pollinator workhorse in the U.S. since people began trucking them up and down highways in the 1950's. Now at least a hundred commercial crops in the U.S. rely almost entirely on managed honeybees, which beekeepers raise and rent out to tend to big farms."

In the January 2010 issue, the story, titled, *Asia's Wildlife Trade* is laid out on thirty pages and is 70% photographic. This story was coded as having 'no relationship. The story was also coded as having three themes including 'animal systems', 'human systems', and 'geographical.' The majority of the textual portion discusses the illegal practice of exotic animal smuggling and trading by notorious Anson Wong. The text states:

> For nearly two years Anson fought extradition to the U.S., but eventually he signed plea agreements, admitting to crimes carrying a maximum penalty of 250 years in prison and a $12.5-million fine. On June 7, 2001, U.S. District Judge Martin J. Jenkins sentenced him to 71 months in U.S. federal prison (with credit for 34 months served), fined him $60,000 and banned him from selling animals to anyone in the U.S. for three years after his prison release.

The photographic portion shows various exotic animals that are on the market, caged, while prospective buyers inspect them or being prepared to be sold. However the photographic portion does not mention Anson Wong and his activities. On page 105, a photograph shows officials at a market in Bangkok confiscating exotic animals while the smugglers stand by. The caption reads, "Tipped off by an informant, Thai police discover a slow loris at the Chatuchak

market in Bangkok (top left). Three dealers were arrested during the raid. In a discouraging

outcome for conservationists, two were let go, and the third paid a light fine of about $600."

Other photographs continue the message in this story by displaying animals in various stages of

suffering and exploitation (example in figure 7).This story was coded as having 'no relationship'

as the photographic portion does not mention Anson Wong and, conversely, the textual portion

does not mention the minimal punishments for the crime in that country.

Figure 8
(Courtesy of nationalgeographic.com)

Human Interest/Discovery

There were eighteen stories that emerged from the theme identification portion of the

analysis for human interest/discovery. The titles for those stories are as follows; *Hubble*

Renewed, Cleopatra, Gokebli Tepe, Evolutionary Road, Dancing in the Dark, Unfrozen, Magical

Mystery Treasure, South Pole, Personal Flight, Fossils, America's Lost City, Star Struck, Jane

Goodall, King Tut, Australia's Giants, Whale Evolution, Unseen Titanic, and *Bionics: A Better*

Life. The highest frequency of direct connection between photographs and text was the 'named

figure', which was identified in 50% of the eighteen magazines. Of the eighteen magazines, all

of the stories did have a direct relationship between photographic and textual content. The

percent of photographic coverage in all 'animal system'-themed stories averaged 16% of the 85

total stories that were coded as stories that contained the same textual and photographic theme.

In addition, twelve out of the eighteen stories were coded as 'one-dimensional', three out of the

eighteen stories were coded as 'two-dimensional', and three of the eighteen stories were coded as

'three-dimensional.'

Relationships between Photographs and Text

In the February 2010 issue, the story *Hubble Renewed* was directly connected by a

'named figure.' The story was contained in eight pages, 96% of which were photographs. There

were no other themes coded in this story. The 'named figure' in the story is shown in a small

picture on the top left side of page 125 and is referenced in the text on the same page. In the short

amount of text that is in this story, it discusses the Hubble Space telescope and its achievements

while the photographs depict direct representations that the Hubble Space telescope has

contributed.

In the July 2011 issue, the story *Cleopatra*, the only direct relationship in this story is the

image of a map which designates possible theories as to where Cleopatra may have been buried.

Apart from the map, the 71% of photographic coverage in the twenty-four pages does not

directly relate the textual portion to the photographic portion. The photographs in the story show

artifacts that relate to Cleopatra or her family or what is believed to have been representations of

her. On page 45 is a full-size page of a carving of a woman's head. The caption next to it states,

"Experts believe that this marble bust with a royal headband may represent Cleopatra and was

perhaps made while she was in Rome. Some features, such as the curve of her nose, match her

official portraits on coins. Ancient authors say she captivated people with her intelligence, quick

wit, and charisma." The textual portion begins by noting that Cleopatra's tomb had yet to be

found, from that point, the text describes a woman who was determined to find her tomb. The text documents her specific efforts in this search. The photographic and textual portions do not relate to each other yet the map (figure 8) is substantial for a relationship between the two because it visually represents the woman's efforts and travels in her search which helps bring the textual and photographic portions together.

Figure 9
(Courtesy of nationalgeographic.com)

Multi-Dimensional Stories

In the July 2010 issue, *Evolutionary Road* is a story comprised of three different themes. The story is laid out on 34 pages and contains 70% of photographic coverage. The only direct connection in this story is a 'named figure' which is also the subject of the story found on page 41. The textual portion and the photographic portion both cover the same theme in that they both discuss remnants of *Ardipithecus Ramidus* who dates back to 4.4 million years ago. In addition, the second most prevalent theme in this story is also supported by both the photographic and textual portion. The remnants were found at a specific location, the Middle Awash Valley, which

is also jointly supported by both portions. The textual portion's third theme describes the terrain in which the remnants were found and how the remnants were able to stay preserved. The photographic portion's third theme focuses on the archaeologists who were working on the field and the findings that they discovered.

Stories with Inconsistent Themes

This last group of stories did not have the same theme in the photographs or text. This group of stories was coded as having a separate dominant theme for the photographical and textual portion. There were thirty-four stories in this group and are as follows: *Masks That Make Magic, Great Bear Rainforest, Food Supply, The Ultimate Alaska Trek, Namibia, Polar Bears, Europe's Wild Side, Conquering a Cave, Alaska's Choice: Salmon or Gold, Kings of Controversy, Unburying the Aztec, Madagascar, Peru's Puzzling Lines, The City Solution, The Bible of King James, Rift in Paradise, Mongolia, Myanmar, China, Miracle Above Manhattan, From Relics to Reefs, Evolution of Feathers, Telltale Scribes, Southern Sudan: A Shaky Place, Great Migrations, Gulf Oil Spill, Fraser Island, Eurasian Railroad, Bahamas Caves, Brazilian Dunes, South Africa, Melt Zone, Restless Spirits,* and *Asia's Wildlife Trade.* None of the stories in this last group carried the same theme for both the photographic and textual portion; thirty-two of the thirty four stories still had a direct relationship between the photographs and the text. Five of the stories were coded as 'one-dimensional', nineteen were coded as 'two-dimensional', and ten were coded as 'three-dimensional.'

Relationships between Themes

In the August 2011 issue, titled *Great Bear Rainforest*, the story is laid out on twelve pages with 84% in photographs. The textual portion of the story focuses on future plans of a natural gas pipeline being implemented into the soil of Alaska's Great Bear Rainforest. It

discusses how the pipeline will affect the area's wildlife and sea creatures as well as the people who are natives to the area. For the textual portion, the 'environmental' theme is the most dominant, the 'geographical' theme is the second most prevalent, and the 'human systems' theme is the third most prevalent. On page 62, the text states:

> The issue is no less critical for the Great Bear Rainforest, a wild stretch of western red cedar, hemlock, and spruce forest that runs 250 miles down British Columbia's coast. Whales, wolves, bears, and humans thrive in the rich marine channels and forests of the Great Bear, whose boundaries have never been precisely defined. 'We don't want another *Exxon Valdez* on our shores,' said Doug Neasloss, a Kitasoo/Xai'xais wildlife guide and marine planner.'

While the text focuses more on how the pipeline will affect the environment and the people, the photographs focus more on the logistics of the pipeline. On page 59, the caption explains, "To reach the port of Kitimat, giant tankers would navigate through the heart of the Great Bear Rainforest. At the port they would load up on petroleum from Alberta's oil sands, transported via the proposed Northern Gateway Pipeline." The photograph portion cites possible disturbances to the animals and terrain but it makes no mention to the people who live there. Without the textual portion, the reader may not have a sense of the full impact of the pipeline.

In the July 2011 issue, the story, *Food Supply*, is directly related. The story is laid out on 24 pages, 74% is photographs. The textual portion in the story primarily focuses the history of produce and how farmers have selected specific breeds in the past to grow crops more efficiently. While this approach was originally beneficial to people when the idea was first implemented, it is now affecting our plant species negatively. On page 116, the text states:

It took more than 10,000 years of domestication for humans to create the vast

biodiversity in our food supply that we're now watching ebb away. Selectively

breeding a wild plant or animal species for certain desirable traits began as a fitful

process of trial and error motivated by that age-old imperative: hunger. Wild

wheat, for example, drops its ripened kernels to the ground, or shatters, so that the

plant can reseed itself. Early farmers selected out wheat that, due to a random

genetic mutation, didn't shatter and was thus ideal for harvesting.

This piece of information is not supported in the photographic portion. The photographs

discuss the same concept about selective breeding but instead focuses on animals, namely

chickens. Page 113 to 114 feature a full-two page spread depicting a range of chicken breeds.

The captions states, "People eat more eggs and poultry than ever, but the world's reliance on a

few high-yielding breeds is edging out hundreds of others: Nearly a third of chicken breeds are at

risk of extinction. That's alarming because many varieties have traits, like heat or pathogen

resistance, that could be invaluable in the future." The text and photographs do not have a direct

relationship, despite their messages covering the same concept: the history and potential future of

the food supply there are separate facts in each mode of communication.

In the March 2011 issue, titled, *The Ultimate Alaska Trek*, the story is directly connected

through a 'named figure.' The story is covered in sixteen pages, 85% of those pages are

photographic. The textual portion focuses on an experienced hiker who trekked, by foot, 25,000

miles and circled Alaska in 176 days. This story was coded as 'three-dimensional. It focuses on

how he arrived to an extremely mentally exhausted state, which is demonstrated in a close-up

photograph of him with tears streaming down his face on page 138. The textual portion also

discusses Alaska (geographical) and its physical terrain (environmental), to give the reader an

understanding about the difficulties of his experience. The photographs, which were coded as

'geographical' (most dominant) and 'environmental' (second most prevalent), more frequently

capture the enormity of Alaska and highlight the rivers and mountains. The third most prevalent

theme is 'human systems', because the story does contain photographs of people (i.e. Andrew

Skurka). Although the text and photographs do show a direct relationship, there are still facts that

are included in the text but omitted from the photographs and vice versa. On page 142, the

caption reads, "Closest bear encounter: About ten yards. Stragey: Threw hiking pole at bear,

which fled. Most mosquitos smitten with a single slap: 14." Conversely, on page 147, the text

states, "A few months later, in the eastern Brooks Range, Skurka himself felt another shift. Bugs

had swarmed him for two days." While the text mentions that he had a problem with insects, it

does not explain to what extent the problem was that he had. The caption provides the detail:

"Most mosquitos smitten with a single slap: 14."

The first research question asked if the photographs or the text dominates the majority of content in each story of the *National Geographic* magazines. The results showed that photographs *significantly* dominate each story. Before conducting the study, it was anticipated that the photographs would greatly contribute to the page content in each story; however, the overall percentage of photographs to text, as the results suggest, is quite surprising. *National Geographic* employs both a photographer and journalist into specific locations to document each project that is eventually contributed to the magazines. Yet the amount of photographs per magazine does imply the approach of *National Geographic* editors and the focus that they wish to convey to their readers.

The second research question concerns what visual and textual themes are present in the *National Geographic* magazines. Before the research was conducted, the five themes (geographical, environmental, human systems, animal systems, and human interest/discovery) were chosen beforehand. This ensured an organized method for the coding process. As the coders began the process, *more than one theme* began to surface from the stories. The methods were modified to adapt to this occurrence.

Most of the stories with only one dimension were found with the 'animal systems' and 'human interest/discovery' themes. This may be because most of these types of stories discussed simple topics such as a type of animal living in a specific area or the developments of the Hubble Space telescope. While these topics are still important, the stories do not identify controversy in them.

The stories that contained the most 'two-dimensional' themes were 'geographical' and 'human systems'. These two types of stories were often found having dependency between two different elements such as *American West*. The story may have not been featured were it not for

the location (the western half of America); on the other hand, the story also may have not been featured were it not for the people in the stories. The story may not have been as interesting had it only talked about the geographical features of the west in America; conversely, the story may have not been as relatable had it simply discussed extremely brief biographies of people in random, unnamed places. Although these findings are not part of the original research questions, it is still appropriate to the analysis. The original research question asked, "What visual and textual themes are present in the *National Geographic* stories?" The answer is that all of those themes were found in the magazines; however, they are also found to be more interconnected than previously anticipated. If all of the stories had only contained one theme for both text and photograph, the stories would not be as impactful as they are. On the other hand, the results showed that the photographs and text do not always correlate in their content or relationship. If the reader only reads the captions and studies the photographs, they will not get the full message. Same is true for the opposite. Important facts were identified in both modes of communication which were not found in their counterparts.

The third research question asked, "Is there a relationship between the themes in the photographs and themes in the text?" The results found that of the 119 stories analyzed, only 9% were not directly connected. This percentage includes the stories which contained two different dominant themes. While some of the stories did not correlate with their themes, there was still a relationship with many of them. This suggests that some of the text and photographs in the stories do function separately in their content yet the reader can find something, such as a named figure or a map, which they can relate between the two. The stories that do not have a direct relationship, whether they have the same theme or not, often *did* discuss the same topic but did not relate to each other in any way. A reader who selectively reads only the photographic portion

may take away a completely different story from a reader who only reads the textual portion. While overall it was found that the textual portion contained more information and details, there were still a small number of stories in which there was an extremely small portion of text to photographs, usually less than 10% text in the entire story.

These stories actually seemed to contain more detail in the captions and photographs because the text usually focused on a vague description in an effort to cover as much information in a page or less, leaving out much detail. If a reader, who is more visually-oriented, is drawn to only the photographs of each story, and doesn't read the text, they may think that they come away with a full sense of the entire story in that magazine; they may be only receiving half or partial amount of the story. In other words, their facts may not be correct or there is a significant detail that they missed in the text. While most of the stories analyzed did have a direct relationship between the photographs and the text, there still shows to be a variation between the themes in each mode of some of the stories.

The limitations of this study are found in the relationships between the text and photographs. The coders were trained to identify only *one* artifact between the photographs and text. Although the results showed that 91% of the stories were connected, the relationship in many of the stories is very weak. Although there was no method to determine how strong the relationship is, if the coder was able to identify only one artifact in which the photographs and text had in common, then it was considered direct. It would be an exhaustive process yet interesting to determine, in a future study, to what extent photographs and text are connected in each story.

In addition, results indicated that 29% of the stories analyzed did not have consistency in the photographic and textual themes. In other words, it was found that some of the stories carried

a different message in the photograph section than it did in the textual portion. Assuming that a visual learner were to be drawn only to the photographs and captions in the stories and take his information from that source, further research would be beneficial to find if the photograph portion is consistent in its use of photographs when building a narrative in a story.

CONCLUSION

Because our world is becoming progressively visual, many people may be increasingly reliant on images to tell them the story. The characteristics of *National Geographic* photographs are not only geographical, environmental, and biological; they also spotlight human concerns and discoveries. Their approach creates an avenue in which to educate and inspire readers. By analyzing the content in the *National Geographic* magazines, the research and results hope to provide a mere window into the intricacy of their stories as well as motivation for future research in this particular niche of communication. The analysis has found that the stories in the magazines are not simply one-dimensional yet factual in one area; instead, their stories have been found to be multi-dimensional with many relationships in each story that are dependent on each other.

The journalists and photographers who contribute to the *National Geographic* Magazines often work apart, producing images and text that are independent of each other (Magazine Publishers of America, 2006) and that, many times, seem to tell their own story. This may lead to stories that at times are supportive of each other and enrich the full message and at other times lead their own story. Marketing studies show that 53% (p.82) of subscribers read only the picture captions (Lutz & Collins, 1993). Whether the visual learner actually received the messages that the photographic narratives in the magazines conveyed, is up for debate.

This research has found themes and relationships, as well as inconsistent ones, between the types of photographs that are taken and the text provided. It has shown that the photographs dominate the stories. This finding may suggest that *National Geographic*'s intent is to allow the photographs to lead the story due to the significantly imbalanced proportion of text to

photographs in each story. The textual content is more saturated in facts and information due to its innate ability to convey more through the written word.

Research contributed to the study of *National Geographic* magazines is beneficial because of the type and quality of content. The photograph and narrative combination are not only informative and educational but the issues are current and relevant on a universal level. The magazines compel the viewers by their high standard of photographical images bringing home to the mind of the reader the simple yet complicated truths in which they are trying to convey. To contribute to learning about geography, *National Geographic* has created five specific themes which are further defined by 18 standards that are proposed as a guideline to inspire and encourage learning. According to *National Geographic*, "The goal of the National Geography Standards is to enable students to become geographically informed through knowledge and mastery of three things: (1) factual knowledge; (2) mental maps and tools; (3) and ways of thinking." Their rationale behind this effort is stated below:

National Geographic states:

> The world facing the high school graduation of 2025 will be even more crowded than the world of today. The physical environment will be even more threatened. The global economy will be even more competitive and interconnected. Understanding and responding to the challenges and opportunities of the world in the twenty-first century will require many skills; the capacities to think and communicate mathematically and scientifically will remain at a premium. Geographic literacy will also be necessary for reasons of enhancing economic competitiveness, preserving quality of life, sustaining the environment, and ensuring national security. As individuals and as members of society, humans

face decisions on where to live, what to build where, how and where to travel,

how to conserve energy, how to wisely manage scarce resources, and how to

cooperate of compete with others

(http://education.nationalgeographic.com/education/standards/national-

geography-standards/?ar_a=1).

National Geographic magazines are not only found to be multi-dimensional and

sophisticated and even unpredictable in its stories, they also cause the reader to ask questions.

Instead of focusing on one element in each story, they take their approach to the next level and

challenge the reader by postulating questions. This implants in the reader a need to know more

and to know why.

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